Psychological Factors in the Aetiology and Treatment of Urinary Symptoms in Women

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ABSTRACT

The mental state of 211 women attending a urodynamic clinic was assessed using questionnaires. Patients with Genuine Stress Incontinence (GSI) had scores comparable to other patients with longstanding physical complaints. Patients with Sensory Urgency (SU) were more anxious than those with GSI. Patients with Detrusor Instability (DI) were as anxious as SU patients and in addition had higher scores on the hysteria and obsessional scales. A subset of patients (25% of the total) was identified, comprising members of all three diagnostic groups, for whom urinary symptoms rendered life intolerable. These patients were as anxious, depressed and phobic as psychiatric in-patients, emphasising the serious psychological morbidity experienced by patients with urinary symptoms.

Fifty patients with DI or SU entered a randomised trial comparing psychotherapy, bladder training and propantheline. The psychotherapy group significantly improved on measures of urgency, incontinence and nocturia though not on frequency. "Pure" bladder training was an effective treatment for frequency, though there was little improvement in urgency or nocturia. Patients became less anxious and depressed. There was a modest improvement in frequency of micturition for patients in the propantheline group.

Thus, bladder training and psychotherapy were effective for different types of urinary symptoms. This finding leads to speculations about the nature of symptoms, the modes of action of the treatments and potential clinical applications.

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CHAPTER ONE

INTRODUCTION

Incidence

Urgency and frequency are troublesome lower urinary tract symptoms which are found in 20% of women aged between 20 and 65 years (Bungay et al, 1980). In a survey of over 4000 nurses Wolin (1969) found that 16% leaked urine once or more each day. Neither survey distinguished clearly between urge incontinence and simple leaking of urine without urgency, due to sphincter weakness. The surveys suggest however, that a substantial morbidity exists.

At the case level, Jeffcoate and Francis (1966) estimated that at least two out of three patients attending the clinic with complaints of incontinence had, in fact, urge-type leakage. In the older population, they considered that incontinence was nearly always due to an unstable bladder, contrary to the commonly held belief that sphincter incompetence was likely to be the cause. Frewen (1972) noted that 80% of patients presenting at a gynaecological outpatients with symptoms of urge incontinence had detrusor instability.

Diagnostic Categories

Chronic urinary symptoms may be the result of a number of conditions, the most important of which are: genuine

stress incontinence, detrusor instability and sensory urgency.

Genuine Stress Incontinence (GSI) is caused by incompetence of the sphincter at the bladder neck. Incontinence occurs during momentary rise of intra-abdominal pressure, for example, during coughing. This condition is usually regarded as a mechanical problem in which the bladder neck cannot be kept closed. As well as pelvic floor exercises, a variety of surgical operations are available.

Detrusor Instability (DI) and ***Sensory Urgency*** (SU) both produce symptoms of frequency, urgency, urge incontinence and nocturia. The two conditions are clinically indistinguishable and the diagnosis is made on cystometry (vide infra). DI is defined as a pressure rise on filling of greater than 15 cms of water. The most common variety is referred to as idiopathic, non-neuropathic detrusor instability. However, it can be congenital or secondary to some other disease process such as multiple sclerosis or arteriosclerosis. SU is diagnosed in the presence of chronic urinary symptoms when cystometry is normal.

Throughout this thesis a number of expressions are used to describe the terminology of lower urinary tract function and dysfunction. The definitions used are as

recommended by the International Continence Society (1977).

Detrusor Instability is a condition in which the detrusor muscle is shown objectively to contract spontaneously or on provocation, during the filling phase, whilst the patient is attempting to inhibit micturition. The unstable detrusor may be asymptomatic and its presence does not necessarily imply a neurological disorder.

Detrusor Pressure is the intravesical pressure minus the rectal pressure.

Frequency is the passage of urine in excess of two hourly or seven times during the waking day.

Incontinence is a condition in which the involuntary loss of urine is a social or hygienic problem and is objectively demonstrable. Loss of urine through channels other than the urethra is termed extra-urethral incontinence.

Initial Flow Rate is the highest recorded flow rate performed, in private, prior to cystometry, when the volume voided is greater than 250 mls.

Initial Voided Volume is the volume voided in private prior to cystometry.

Intravesical Pressure is the pressure within the bladder.

Nocturia is the arousal from sleep twice or more every night to void.

Peak Flow Pressure is the detrusor pressure rise at peak urine flow rate.

Peak Flow Rate is the highest recorded flow rate when the volume voided is greater than 250 mls.

Rectal Pressure is the pressure recorded in the rectum, this is taken as an approximation to the intra-abdominal pressure.

Residual Volume is that volume of urine remaining in the bladder after complete micturition.

Stress Incontinence denotes 1) a symptom, 2) a sign, 3) a condition, usually referred to as genuine stress incontinence.

1) The **symptom** stress incontinence is the patient's statement of involuntary loss of urine when exercising physically (in the broadest sense of the expression).

2) The **sign** stress incontinence denotes the observation of involuntary loss of urine from the urethra immediately upon an increase in abdominal pressure.

3) The **condition** genuine stress incontinence is involuntary loss of urine when the intravesical pressure exceeds the maximum urethral pressure but in the absence of detrusor activity.

Urge Incontinence is involuntary loss of urine associated with a strong desire to void. It may be subdivided into **Motor Urge Incontinence**, which is associated with uninhibited detrusor contractions and **Sensory Urge Incontinence**, which is not due to uninhibited detrusor contractions.

Urgency is a strong desire to void which allows little time for delay.

Volume Passed is the actual volume voided during the voiding phase of cystometry.

Investigation Procedure

Where facilities exist, patients with chronic urinary symptoms may be referred to a urodynamic clinic which specialises in the investigation and treatment of disorders of the female lower urinary tract, or a urological clinic specialising in micturition disorders.

Following routine history and examination there are special investigations to measure the function of the bladder and urethra. As such clinics are tertiary referral centres few patients have a urinary infection as a primary cause of their symptoms.

Cystometry Technique

Cystometry is the method by which the pressure/volume relationship of the bladder is measured.

In the studies described in this thesis the cystometric technique was consistent both in method and the equipment used. The bladder was accessed transurethrally. The filling medium was 0.9% saline at room temperature. The bladder was filled with the women lying in the dorsal position. The filling rate was standardised at over 100ml/min, using a gravity feed. Zero pressure was defined as that at the level of the symphysis pubis. Pressure was measured using external "Statham" transducers aligned to the pubic symphysis. Pressure was transmitted to the transducers through 1mm internal diameter semi-rigid polythene manometer lines. Intra-abdominal pressure was assumed to be the same as rectal pressure which was measured through a fluid filled finger stall tied over the end of the pressure line to prevent faecal blockage. Detrusor pressure was derived by electronically subtracting rectal pressure from intravesical pressure and the resulting signal displayed continuously.

The women first performed a free flow rate; the peak flow rate and the volume voided being recorded. Catheterisation was performed without local anaesthetic

using a 12F Nelaton catheter into the side-hole of which was "piggy-backed" a 1mm internal diameter, sterile polythene pressure line. Residual urine was drained, measured and a sample sent for microscopy, culture and the antibiotic sensitivity of any pathogens isolated. As filling was started the women were instructed to indicate when they first felt that they could void and the volume at which this sensation was experienced was recorded. The women were all asked to try to inhibit the urge to void until they could not tolerate any further fluid in their bladder. Filling was stopped at this point and the total volume of fluid instilled recorded as the maximum cystometric capacity. At maximum cystometric capacity the filling catheter was removed, leaving the pressure monitoring lines in position. The table on which the women were lying was tipped to the upright position and the detrusor pressure response to position change noted. Serial coughs were used to elicit the sign of stress incontinence and any involuntary detrusor pressure rises in response to coughing. The presence of these was recorded. The voiding phase was then studied with the women in the seated position.

The following parameters were recorded for each filling cystometry.

1) The peak free flow rate and the volume voided during that void.

2) The volume of any residual urine.

3) The volume of saline which had been instilled into the bladder when the first desire to void was experienced.

4) The maximum cystometric capacity.

5) The presence or absence of leakage in response to coughing.

6) The maximum pressure found during any involuntary detrusor activity during bladder filling.

7) The maximum pressure found during any involuntary detrusor activity during provocation by position change and coughing.

Chapter four discusses other special investigations that can be used for patients with micturition disorders.

Following these investigations treatment is offered as appropriate. For some patients with GSI, surgical treatment may be carried out by the referring agency. At present, patients with DI or SU are treated with drugs or bladder training (vide infra).

Hypotheses

This work sets out to answer a number of questions which can usefully be expressed as the following hypotheses:

1) The clinic survey of patients attending the Urodynamic Unit, Department of Obstetrics and Gynaecology, St George's Hospital Medical School, would show psychological disturbances in accordance with previous surveys.

2) Patients with GSI would show psychological disturbances commensurate with those associated with a chronic physical disorder.

3) Patients with DI or SU would show more psychological disorders than patients with GSI.

4) Patients who reported greatest distress would score higher on the standardised rating scales than patients who reported little distress.

5) There would be consistency of results across the standardised questionnaires.

6) Bladder training would be an effective treatment for some patients with micturition disorders.

7) Psychotherapy would be an effective treatment for some patients with micturition disorders.

8) Propantheline would have little effect on urinary symptoms.

9) Patients who symptomatically improved would also improve psychologically.

10) There would be a positive correlation between symptomatic improvement and cystometric findings.

Hypotheses 1 to 5 are discussed at the beginning of chapter 8 and hypotheses 6 to 10 at the beginning of the chapter 11.

Overview of Thesis

Chapter two consists of a review of the relevant literature. The first subheading is ***Emotions and Bladder Function*** in which previous work linking the function of the bladder to psychological factors is reviewed. The second section is entitled ***Treatment*** and presents a review of existing therapies for the urinary symptoms of urgency and frequency. The chapter concludes with a ***Summary*** of the current state of scientific knowledge in this area.

Chapter three is a review of psychotherapy outcome research. The special problems associated with assessment of psychological therapies are discussed with particular reference to the research presented in this thesis. The

chapter begins with an ***overview*** It then reviews those aspects of ***psychoanalysis*** that are relevant to the research. ***Insight orientated psychotherapy*** and ***behaviour therapy*** are then considered. ***Comparative outcome studies*** are reviewed and the chapter concludes by reviewing ***psychosomatic outcome research.***

Urodynamic methods of assessment are discussed in **chapter four.** The ***special investigations*** relevant to DI and SU are considered.

Chapter five discusses the choice of psychological rating scales. The chapter reviews the ***basic principles*** and then considers the ***individual rating scales.***

Clinic Survey

The method of the clinic survey is presented in **chapter six** and the results in **chapter seven.** These are discussed in **chapter eight.** The chapter begins with a ***discussion of the hypotheses*** presented earlier in this introductory chapter.

Treatment Trial

Chapter nine outlines the methodology of the treatment study. **Chapter ten** presents the results of the study and

these are discussed in **chapter eleven.** The ***hypotheses are discussed*** at the beginning of this chapter.

Chapter twelve reviews some possible ***clinical applications*** of this work and some suggestions for ***further research.***

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CHAPTER TWO

REVIEW OF LITERATURE

Emotions and Bladder Function

There has been little published research on the relationship between the psyche and this particular area of the soma. Mosso and Pellicani (1882) were the first to investigate bladder function, using cystometry in female dogs. They found that strong emotion or the sound of running water led to detrusor contraction. They later confirmed their findings in humans.

Menninger (1941) suggested that from a psychological standpoint urination had many conscious and unconscious meanings, such as the erotic and aggressive components. He also referred to self-destructive and self-punitive elements. He presented a number of case histories to support his hypothesis. One in particular illustrated the erotic aspect and also the dangers of treatment. A sixty-four year old woman with a life-time history of frequency was treated with gradual dilatation of the bladder. No sooner had this been achieved than the patient became restless, anxious and attempted suicide. The urinary hyperactivity was a means of sexual gratification, which required that the erotic significance remain unconscious. Menninger continues, "Her physician quite unwittingly took from her the only outlet for erotic gratification, and as we know, the blocking of all erotic outlets usually

results in anxiety, which may, as in this case, be unendurable."

The importance of intrapsychic mechanisms was tested in an experimental setting by Straub et al (1949) who interviewed female patients during cystometry. When confronted with "significant" psychodynamic, sexual or aggressive issues seven of the eighteen patients produced characteristic detrusor contractions. This particular study is often quoted as evidence that chronic urinary symptoms have a psychodynamic aetiology. However, there were some serious methodological drawbacks. Cystometry involved catheterisation of the bladder only; any increase in abdominal tension would be transmitted directly to the transducer. Straub's findings may be explained by the fact that stressful questioning resulted in tensioning of the abdominal muscles. Present day cystometry involves measurement of the abdominal pressure as well as intravesical pressure, the difference approximating more closely to the detrusor pressure than in Straub's experiment.

This earlier work concentrated on the possible relationship between intrapsychic stress and bladder function. An alternative approach is to measure aspects of personality and neurotic symptomatology.

Jeffcoate and Francis (1966) gained a clinical impression that patients with urgency incontinence were anxious and introspective. Two studies (Rees and Farhoumand 1977, Stone and Judd 1978) have shown a relationship between detrusor instability and hysterical personality traits. This is not a consistent finding: Freeman, Mcpherson and Baxby (1985) did not find increased hysterical personality traits in their study of DI. In a small study of fifteen patients with urgency and urge incontinence and forty-two patients with other urological diagnoses Crisp and Sutherst (1983) found that those with DI and SU were significantly more anxious and neurotic. There have not been any other reports of investigations into the relationship of personality factors and bladder dysfunction. The inconsistent findings and paucity of studies suggest that more work is needed in this area.

Frewen (1972, 1978, 1980 and 1982) maintained that DI is a psychosomatic condition. His evidence rested, first, in the ability to elicit a history of emotional trauma antedating the onset of the symptom. Sometimes the search for such precipitating factors needed to be exhaustive and might reveal only "unessential triviality". Secondly, the efficacy of psychological treatment was thought to support a significant psychogenic component in the genesis of DI and SU. Frewen's treatment included bladder training and education about supposed anatomical and psychological

mechanisms. The fact that patients with emotional or social problems had a poor response to his treatment provided him with further support for his views on aetiology. However factors that may be therapeutic need not imply any causality. Neither Frewen's nor Jarvis' work provides evidence that an effective therapeutic approach necessarily implicates that factor in causation.

In a recent study, (Pierson, Meyer and Ostergard 1985) 23 patients with DI were compared with 23 matched patients with GSI. Those with DI had significantly higher scores on the Holmes and Rahe (1967) life stress measure, as well as being more depressed. This is the only study to report on the possible contribution of life events to urinary symptoms.

Thus, there have been positive findings suggesting that emotional factors are important in the causation and maintenance of urinary symptoms. Two themes emerge: first, there are characteristic personality traits related to DI and SU; secondly, there is a suggestion that such patients use characteristic intrapsychic mechanisms. However, some of the findings are contradictory or from poor studies with methodological shortcomings. More attention has been paid to the problems of treatment.

Treatment

Over the years a number of empirical treatments have been advocated for DI and SU, involving surgery, cystodistension, pharmacological and psychological methods. These will now be considered separately.

Surgery

Various forms of denervative surgery have been attempted. Ingelman-Sundberg (1959) reported that after hypogastric nerve block there was symptomatic improvement, but the symptoms recurred in 15% of patients. He thought this was due to re-growth of nerves though no evidence was cited to support this and it must be considered an unlikely explanation. Later work by Hodgkinson and Drukker (1977) on the same procedure concluded that it may benefit patients with severe detrusor instability in whom other treatments have failed. Sacral neurectomy (Torrens and Griffiths 1974) has also been tried, but with disappointing results.

Cystoplasty has been used by Essenhigh and Yeates (1973) but the actual cure rate was uncertain and the procedure has complications. Extensive resection results in diminished bladder sensation, but if surgery is too limited the bladder will continue in uninhibited contraction. Conventional bladder neck surgery may cure any genuine stress incontinence but may make symptoms of

detrusor instability worse. The reason for this is not clear (Cardozo 1979).

Cystodistension

Cystodistension involves filling the bladder to maximal capacity, held at systolic blood pressure whilst the patient is anaesthetized. Ramsden et al (1976) reported that 80% of patients were symptomatically cured or improved. However Pengelly et al (1978) found no objective conversions from instability to stability. This procedure is not without hazard: in particular there is a risk of bladder rupture. These widely differing results, using an apparently similar procedure, suggest different patient populations or assessment techniques, or alternatively that a significant placebo effect may operate.

Pharmacology

Bladder emptying is accomplished primarily by contraction of the detrusor muscle, which is innervated by cholinergic fibres of the parasympathetic nervous system. Many drugs are used clinically to alter bladder function. Included are anticholinergic preparations (for example, propantheline), ganglion blockers (for example, emepronium bromide), musculotropic agents (for example, flavoxate hydrochloride), calcium antagonists and prostaglandin synthetase enzyme inhibitors (for example, flurbiprofen).

In some cases the mechanism of action is poorly understood (Benson et al 1977). Drugs may produce temporary improvement, but when therapy is stopped the symptoms invariably return (Cardozo 1979).

In 60% of adult patients with "irritative" symptoms propantheline resulted in improvement with regard to frequency, urgency, suprapubic pain, dysuria and nocturia (Bradley and Cazort 1970). Diokno et al. (1972) used propantheline in patients with enuresis associated with uninhibited neurogenic bladders. Inappropriate detrusor contractions were abolished. However, patients with enuresis and normal cystometrograms failed to respond to propantheline.

Flavoxate hydrochloride has been shown (Conti and Setniker 1975) to have considerable direct smooth muscle relaxant properties with weak or absent anticholinergic activity. However Benson et al (1977) could not confirm either significant musculotropic relaxant or anticholinergic actions. Clinically it appears to be of limited use: Cardozo and Stanton (1979) compared emepronium bromide (Cetiprin) and flavoxate hydrochloride (Urispas) and found symptomatic benefit in less than 30% of patients in each case.

In vitro work has shown that prostaglandins are important in the action of smooth muscle in the human

urinary tract (Abrams and Feneley 1975). Flurbiprofen (Froben), a prostaglandin synthetase enzyme inhibitor, has been used in a double blind crossover trial with a placebo (Cardozo et al 1980). Flurbiprofen was shown to improve symptoms and reduce detrusor pressure. At the end of the trial 19 of the 27 patients elected to continue with the medication, notwithstanding the side effects such as nausea, vomiting and indigestion which occurred in 43%.

Imipramine has been used for the treatment of childhood nocturnal enuresis. The most likely site of action for the drug is as a direct action on bladder smooth muscle distal to the cholinergic receptor site (Labay and Boyarsky 1973).

Benson et al (1977) concluded: "Defining the mechanism of action of any drug at the bladder level would appear to be important in the rational treatment of a variety of clinical bladder disorders since a combination of drugs with different sites and/or mechanisms of action has theoretical and practical synergistic advantages over the use of a single agent or a group of agents with the same mode of action." However such work has yet to be satisfactorily completed.

In spite of the modest improvements shown by some of these trials and procedures Turner-Warwick and Whiteside

(1979) summarised the clinical situation by concluding that no surgical, pharmacological or neurosurgical procedure will effectively convert an unstable detrusor mechanism to a stable one with any degree of reliability.

Psychological Treatments

Jeffcoate and Francis (1966) are credited as being the first to describe bladder training as a treatment for urge incontinence, quoting a symptomatic cure rate of 55%.

In 1978 Frewen reported a study on bladder training. After cystometric diagnosis 30 patients were admitted as in-patients for an average of ten days. An additional 10 patients had similar treatment as outpatients. During this time the basis of bladder training was explained to the patient who then kept a urinary diary. The author referred to the additional use of supportive therapy, anxiolytic and anticholinergic drugs, though this was not quantified, nor was any attempt made to evaluate the relative contributions of the pharmacotherapy. Frewen reported an objective cure rate of 82.5% at three months. The results were not broken down on an in-patient versus outpatient basis, so it is difficult to justify the author's conclusion that outpatient treatment is rarely helpful. Of the seven failures, five had chronically ill husbands. Frewen considered that their "environmental

obligations" made it impossible for them to be amenable to any form of treatment. Further psychological analysis of this cohort would have been interesting.

Jarvis and Millar (1980) reported broadly similar findings in their controlled trial of in-patient bladder training for sixty patients, concluding that bladder training was the treatment of choice for detrusor instability. In 1982 Jarvis reported a study of in-patient bladder training for patients with sensory urgency. Twenty of the thirty-three patients improved and became continent. Elder and Stephenson (1980) treated 21 patients with Frewen's regimen and concluded that the majority were cured or improved.

These treatment studies have been carried out by surgeons or research nursing staff who have not had any formal training in behavioural techniques. None of the studies control for any possible non-specific influence of nursing and other paramedical staff such as informal advice giving or counselling.

The purpose of admission to hospital, or the use of additional techniques such as anxiolytic medication, was rarely defined. However, such criticism cannot be applied to Pengelly and Booth (1980). In their outpatient treatment study, patients with DI were provided with a micturition chart and measuring jug. In addition, the

therapist explained the possibility of an emotional aetiology. These two aspects, the documentation of symptoms and explanation of the rationale of treatment, form the basis of bladder training as understood today. Nineteen out of 25 patients were cured or improved symptomatically and 11 out of 25 cured or improved on cystometry. These results probably represent the most realistic cure rate for DI patients treated with outpatient bladder training.

Recently, there have been two reviews of the longer term effects of bladder training. Frewen (1982 and 1984) presented the results of outpatient bladder training, a procedure that he has developed over a number of years, and quotes a cure rate of 86%. In his view, detrusor instability was caused by the patients' abnormal urinary symptom. This suggests that patients with SU go on to develop DI if the symptoms persist.

Holmes et al (1983) reviewed 56 patients 1 to 5 years after in-patient bladder training. There was an overall three year response rate of 50%. Those with SU responded well to bladder training: 94% improved and of these only 6% relapsed. The group of patients with detrusor instability were divided into two. For those with idiopathic DI, the response rate was 90% and the relapse rate 44%. There was a 55% response rate in patients with congenital or arteriosclerotic DI but all relapsed.

Holmes concluded that patients with objectively stable bladders and the urge syndrome responded well to bladder training. The response was sustained, giving a good long term result.

Hypnosis

Hypnotherapy has been used with success by Freeman and Baxby (1982). In this trial 50 patients with detrusor instability underwent 12 sessions of hypnosis. The treatment consisted of induction of the hypnotic state, relaxation, ego strengthening and suggestions regarding symptom removal. Patients were instructed to practise daily at home using a pre-recorded tape.

At the end of the trial 29 patients were symptom-free, 14 improved and 7 were unchanged. This study also showed that hypnosis improved bladder function: three months after the end of treatment 44 patients underwent cystometry and the objective measures obtained then correlated positively with the reported symptomatic improvements.

In addition to the hypnotic techniques described, the author (Freeman R M, 1985, personal communication) was aware that the patients also used the sessions to discuss personal stresses and worries.

Biofeedback

Treatment with biofeedback was reported by Cardozo et al (1978). This study recruited 27 patients with DI who had failed to respond to other therapy such as medication or outpatient bladder training. The patients were given an auditory signal which altered in tone in response to changes in bladder pressure as recorded by a bladder pressure catheter. Over a period of an hour the bladder was slowly filled and emptied, usually three times. Patients were asked to keep the tone low by whatever means possible. This varied from patient to patient, some preferred to talk, others found that tightening certain muscle groups was helpful. Most patients attended for six to eight sessions. Using objective and subjective methods of assessment 81% of the patients improved. These were good results but the procedure was time-consuming of staff and equipment.

In a small pilot study using the Hostility and Direction of Hostility Questionnaire (HDHQ) (Caine, Foulds and Hope 1967) Cardozo et al (1978) investigated the mental state of some of the patients who had taken part in the biofeedback trial. Those who improved or were cured scored a mean of 4.56 whereas those who were unchanged scored a mean of 11.8 (Normal 0.5). It was suggested that intrapsychic factors may be important in determining the effectiveness of biofeedback and the HDHQ might be a

method of patient selection for this treatment. They did not however, make any suggestions for treatment for the high scoring patients. Such patients might perhaps benefit from first attempting to correct the psychological mechanisms that led to the abnormally high scores.

Psychotherapy

Hafner, Stanton and Guy (1977) reported a study of 26 patients with frequency, urgency and urge incontinence. They were divided into two groups on the basis of their neuroticism score on the Eysenck Personality Inventory (EPI) and Middlesex Hospital Questionnaire. All patients were treated with four to six sessions of autogenic training (a type of relaxation treatment), with the exception of the last four patients who received individual psychotherapy. Seven patients refused treatment. Patients in the most neurotic group reported either a great or moderate improvement in urinary symptoms whilst the majority in the least neurotic group showed slight or no benefit. The authors suggested that this latter group of patients were denying or disclaiming their symptoms, citing as evidence the patients' biographical and medical histories. The four patients who had individual psychotherapy were not discussed as a separate group. The authors did not record their measures of

improvement, so it is difficult to draw any firm conclusions from this study.

Summary

Several studies suggest that patients with chronic urinary symptoms have characteristic personality traits such as increased neuroticism and hysteria scores though not all studies agree on the type of profile.

There is little evidence that conventional treatments such as surgery or drug therapy are effective. They have complications or troublesome side-effects and their use is difficult to justify in a chronic condition which is not life threatening.

Given the above two points, trials of psychological treatments seem promising, even if the mechanisms that might have brought about any improvement are not understood or poorly quantified. Most work has been reported on bladder training, with the overall conclusion that patients with SU or idiopathic DI respond reasonably well. For SU patients at least, this improvement is sustained. There have been too few trials of other psychological modes of treatment to allow any general conclusions to be drawn.

A number of trials suggest that regardless of the treatment offered, patients with gross psychological disturbances respond poorly.

Treatment studies are often small and examine only one type of therapy. There are no randomised trials comparing different types of treatment, so it is difficult to compare results, and this why the treatment study described in this thesis was carried out.

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CHAPTER THREE

PSYCHOTHERAPY OUTCOME RESEARCH

Introduction

This chapter will review the literature and consider the theoretical aspects of outcome research of psychotherapy for neurotic illness in general and psychosomatic conditions in particular. Emphasis is placed on psychotherapies that are used in this study.

Eysenck raised the debate about the effectiveness or otherwise of interpretive psychotherapy. His classic paper of 1952 has been supplemented by later publications (1960 and 1969).

In his original paper he referred to the methodological shortcomings of published data and notably the absence of suitably controlled studies. He recognised that an understanding of the natural history of neurotic disorders was necessary if any meaningful conclusions are to be drawn from research data on outcome studies. Initially, using data provided by Landis (1937) and Denker (1946) he proposed that two out of three patients can be expected to spontaneously recover within a two year period. Later, Shepherd and Guenberg (1957) added to the debate by concluding that the average duration of neurotic illness is between one and two years.

This raises an important question about the natural history of micturition disorders. To date, there have not been any reported studies that have attempted to assess

the average duration of symptoms. However, the work of Bungay et al, (1980) suggests that patients with GSI are unlikely to completely recover without intervention. The position of patients with SU and DI is less clear, although the work of Frewen (1972, 1984) and Holmes et al (1983) for example, suggests that at best, it is a chronic, remitting condition. The relationship between DI, SU and symptomatology is a matter of debate, and is discussed in chapter two on the review of literature and in chapter four on methods of urodynamic measurement.

In 1966 Greer and Cawley reported on a four to six year follow-up investigation of 160 neurotic patients who were admitted to the Maudsley Hospital. There were a number of conclusions about outcome from this study and with regard to diagnostic groupings they found that patients with depressive, hysterical or anxiety reactions had the most favourable outcomes, whilst those with obsessional-compulsive or hypochondriacal symptoms had a poor prognosis. Patients with DI or SU also appear to present with depressive, hysterical or anxiety reactions and thus this work suggests that these patients might be expected to have a favourable prognosis. However, Greer and Cawley also found that the outcome was related to a number of variables describing pre-morbid personality and precipitating events and noted that there were variables associated with unfavourable outcome, one of which was a

duration symptoms of more than 5 years. Patients presenting to a urodynamic clinic are also notable for the chronicity of symptoms (Cardozo et al 1980) and this fact may be an important contributor to the unfavourable outcome of current treatments for patients with DI or SU (Holmes et al 1983).

Eysenck first considered the results of a number of treatment studies that covered over 7000 patients. He divided them into three groups. The best recovery figures (72%) were obtained from patients who received care from their General Practitioners or only custodial care. Patients who were subjected to eclectic treatment improved to a lesser degree - 64%. Only 44% of patients receiving psychoanalysis improved, although this figure improved to 66% if patients who broke off treatment were excluded. These results, and findings from a number of other studies, lead Eysenck (1960) to some conclusions which are of particular relevance to this thesis:

"1. When untreated neurotic control groups are compared with experimental groups of neurotic patients treated by means of psychotherapy, both groups recover to approximately the same extent.

2. Neurotic patients treated by means of psychotherapeutic procedures based on learning theory improve significantly more quickly than do patients treated by means of psychoanalysis or eclectic

psychotherapy, or not treated by psychotherapy at all.

3. Neurotic patients treated by psychoanalytic psychotherapy do not improve more quickly than patients treated by means of eclectic psychotherapy, and may improve less quickly when account is taken of the large proportion of patients breaking off treatment.
4. With the single exception of psychotherapeutic methods based on learning theory, results of published research suggest that the therapeutic effects of psychotherapy are small or non-existent, and do not in any demonstrable way add to the non-specific effects of routine medical treatment, or to such events as occur in patients' every-day experience".

Such conclusions have aroused much debate. Views have ranged from outright rejection to ready acceptance. Some writers commented on the limitations of the data on which Eysenck's original evaluation was made although a good deal of the discussion has centred on how best to scientifically test the efficacy of insight orientated psychotherapy. Eysenck was clear on this point (1969), stating that "they (psychoanalysists and psychotherapists) must define clearly and unambiguously what is meant by neurotic disorder and what is meant by cure; they must put forward methods of testing the effects of treatment which are not dependent on the subjective evaluation of the

therapist, and they must demonstrate that their methods give results which are clearly superior to any alternative methods, such as those of behaviour therapy or of spontaneous remission".

This introduction has outlined the essentials of the debate about psychotherapy and it is now appropriate to consider in further detail some of the work that has been reported on psychotherapy.

Psychoanalytic Treatment

The work presented in this thesis does not use psychoanalysis for treatment. However, a short discussion of the topic is appropriate in that it particularly highlights the problems that arise when considering the concept of cure, especially when the measurement of change is linked to the theory on which the treatment is based.

Freud proposed a number of reasons for not attempting to evaluate outcome and these are succinctly presented in Introductory Lectures on Psychoanalysis (1922) as follows;

"... statistics would be valueless if the units collated were not alike and the cases which had been treated were in fact non equivalent in many respects. Further, the period of time that could be reviewed was short for one to be able to judge the permanence of the cures; and many cases it would be impossible to give any account. They

were persons who had kept both their illness and their treatment secret, and whose recovery in consequence had similarly to be kept secret. The strongest reason against it, however, lay in the recognition of the fact that in matters of therapy, humanity is in the highest degree irrational, so that there is no prospect of influencing it by reasonable arguments."

This quotation indicates that Freud was aware of the essentials of the problem; namely selection and matching of controls, reasonable period of follow-up and finally, the outcome criteria to be used. Freud's greatest objection is philosophical and this aspect has been taken up by others. However, Grünbaum (1977 and 1979) presented many new comments on this subject and opposed Popper's (1963) conclusion that psychoanalytic theory is non-falsifiable. He considered that the effectiveness of psychoanalytic therapy is of importance to the theory as a whole and that claims for its therapeutic effectiveness are testable.

Freud's views need not necessarily only apply to psychoanalysis and such pessimism would have to generalise to all forms of treatment for psychological disorders. Clearly, this is an unsupportable position. Nor, is it helpful to take the view that psychoanalysis is in someway a meta-theory not subject to the strictures of the medical model. However, some authors (Rachman and Wilson 1980)

have proposed that this conventional model is unhelpful when considering the neurosis and personality disorders and have proposed a more sociological view which by its nature does not encompass the notion of "illness" or "cure". However, the medical model is robust and sanctioned by common usage and can generate testable hypothesises. It is of value when considering other forms of psychological (q.v.) and medical treatment for psychological disorders. Thus, there is no logical reason to absolve psychoanalysis from the same strictures.

The work of Malan (1963, 1976a, 1976b) is notable for its attention to the central question of outcome and its advocacy of rigorous scientific standards. The question of success of treatment was addressed in a novel way: For each patient a plausible set of psychodynamic criteria of outcome was postulated and these were based on manifest evidence of disturbances in social relationships and assumed that each symptom was an expression of a compromise between id and superego forces. Thus, outcome could be measured in terms of social relations and conflict resolution. It also allowed for the concept of a false resolution if, for example, the symptoms diminished at the cost of the patient withdrawing from social relationships. In the first study, there were 21 patients and a conclusion was reached on 18, of whom 10 were unchanged. Five obtained a substantial resolution of the

main problem. The most obvious shortcoming is the absence of a control population, though other criticisms include the lack of an independent assessor and the retrospective nature of the assessments which were made on written case notes, rather than primary data.

The second study was an attempt at replication and provided the opportunity to refine methodology. In spite of the sophistication of the sets of psychodynamic hypotheses generated the information was reduced to a linear eight point scale and other reviewers (Rachman, and Wilson, 1980) have considered that "even if all other aspects of this outcome study were flawless, the condensation of large amounts of subtle clinical information into a single digit would be a serious if not fatal weakness." As far as outcome was concerned, the results were as discouraging as the first study in that only five of the 30 patients were cured and 2 of them were regarded by Malan and having occurred spontaneously.

DeWitt et al (1983) noted how Malan's work mirrored the clinical practice of psychodynamic psychotherapy and devised a replication of his work with an important modification: two groups of workers would devise a formulation for each patient, based on a video-taped interview. There were four important findings:

1) The agreement between these independently formulated hypothesis and criteria sets ranged from poor to moderate.

2) The reliability of independent change ratings made by the judges within a team who used the same hypothesis was found to be good, regardless of whether it was "their" hypothesis or the hypothesis and criteria set formulated by another team. Thus, although reliable, the dynamic change ratings based on those formulations were found to be linked to the formulations and, therefore, did not agree.

3) Changes in symptoms were found to constitute a reliable and major portion of dynamic change ratings.

4) Changes in a nonsymptomatic, dynamic dimension were found to constitute a smaller, potentially reliable portion of dynamic change ratings; however, ratings on this component were found to follow the formulations in the direction of the actual disagreement.

The authors concluded that their findings indicated that outcome ratings based on assessment of dynamic change will not be satisfactory for psychotherapy research until some improved method for reaching agreement on the initial dynamic formulation is developed. "The method suggested by Malan, while attractive in its basic goals, was insufficient in our replication effort."

To this end, Luborsky (1977) has developed carefully structured smaller units of analysis that specify the level of inference. His method for defining the core conflictual relationship theme was found to produce good inter-judge agreement in a reliability study conducted by Levine and Luborsky (1981). However, this method still does not include an approach for defining change criteria associated with the core conflict. Also, it is very painstaking and time consuming. However, it does appear to successfully address the question of reliability in clinical formulation.

These results demonstrate the extreme difficulty in measuring the process of psychotherapy based psychodynamic formulations. As a result, any outcome measures that are then based on such changes are likely to be misleading. The treatment trial reported in this thesis does not make any claims about the psychodynamic conflicts that the patients may or may not have had and uses the changes in urinary symptomatology as the main measure of outcome.

Insight Orientated Psychotherapy

Brill et al (1964) carried out a long-term double-blind study of medication and psychotherapy on a population of 229 patients. On acceptance for the trial the patients were randomly allocated to one of three drug

treatments or to psychotherapy (one hour per week) or to placebo or to a no-treatment waiting list control. The trial was both therapist and patient rated in addition to MMPI tests before and after treatment. The drop-out or not assessed rate was 43.5%. However, the authors concluded that "the patients in all five groups showed a tendency to improve, in contrast to a lack of improvement in the patients who were kept on a waiting list and received no treatment. In a two year follow-up Koegler and Brill (1967) reported "the most marked improvement is in the rated status of the waiting list (i.e. untreated) patients". This finding would suggest that treatment accelerated a naturally occurring phenomena. Once more, the question of spontaneous remission becomes particularly pertinent, although as far as this trial is concerned, no conclusions can be drawn from the data published by the authors.

Greer and Cawley (1966) also examined the relationship between treatment and outcome. In their study of in-patients 63 received supportive therapy, ten leucotomy, twenty-eight had psychotherapy and nineteen had psychotherapy combined with physical treatment. Thirteen stayed in hospital for less than two weeks. The psychotherapy patients were not representative of the patients as a whole in that they had good pre-morbid personality, a history of precipitating factors and more

were married. None of the sixteen patients whose symptoms were regarded as life long received psychotherapy. Thus, "patients who had received psychotherapy would be expected to have had a more favourable prognosis, irrespective of treatment". At discharge, the psychotherapy patients did have a significantly more favourable outcome than the remainder. Although at follow up the difference between the patients who had psychotherapy and those who had no treatment was no longer significant. This study was not primarily about the efficacy or otherwise of psychotherapy, however the selection bias in favour of the patients receiving psychotherapy "does not necessarily demonstrate that psychotherapy was ineffective in these patients. From the findings of the present study we are not entitled to draw any conclusions regarding the efficacy of psychotherapy".

Siegel et al (1977) randomly assigned patients to immediate psychotherapy or a waiting list control, and assessed the effects of treatment by administering a symptom check-list after nine months. The treated group showed a small improvement. There were several weakness to the study: use of a non-standardised check list; the very high dropout rate (39% in treatment group) and the use of trainee psychotherapists. Piper et al (1977) also used inexperienced therapists but used a wider and more intensive range of assessment procedures. The design of

the trial was similar and the forty-eight neurotic out-patients were divided into two matching groups and then provided with treatment immediately or after a delay of three months. Both treated and control groups improved and on target symptoms there were no differences between the groups. On one of five criteria the treatment group did significantly better than the controls.

Frewen (1978) described a treatment package that possibly could be considered to include psychotherapy, although in general his results are more favourable than those for patients with neurotic disorders. The non-behavioural psychotherapy treatment used in the trial presented in this thesis draws on the above findings and limitations. In general, these results highlight the importance of good experimental design. To this end, the treatment trial has attempted to address some of these issues by use of a control group, random allocation and the use of the most appropriate outcome measures that were available.

Behaviour Therapy

So far this chapter has only reviewed the problem of therapeutic outcome research with respect to psychoanalysis and other insight oriented psychotherapies. Consideration will now be given to psychological therapies which come under the general term of behaviour therapy. This encompasses a range of heterogeneous procedures with various rationales. In spite of some conceptual differences there is a common core of assumptions that behaviour therapists hold. It is distinguished by two basic characteristics: 1) a psychological model of human behaviour (and especially abnormal behaviour) that differs fundamentally from the traditional intrapsychic, psychodynamic or quasi-disease models of mental illness; and 2) a commitment to scientific method, measurement and evaluation.

Bergin and Lambert (1978) concluded that psychoanalytic therapy, humanistic or client-centred psychotherapy, and behaviour therapy "rest on a reasonable empirical base", "achieve results superior to no-treatment procedures and various placebo treatment procedures", and "have been found to be about equally effective with the broad spectrum of outpatients". Luborsky et al (1975) compared behaviour therapy to psychotherapy and reported that in six of the nineteen comparisons, behaviour therapy was significantly superior. However, they dismissed these

studies on the grounds that they were poorly controlled and they limited their analysis to neurotic problems that would be considered to have the most favourable prognosis, and excluded a wide range of common childhood and adult disorders, remarking that behaviour therapy might be the preferred treatment for problems like enuresis and habit disorders. This last observation is of special relevance to this thesis. The results of bladder training (reviewed in the chapter on literature review) would support this statement.

Kazdin and Wilson (1978) appear to have published the most recent and comprehensive review. Their overall finding was that there were few studies sufficiently well-controlled to permit unambiguous interpretation of results. Fundamental problems in experimental design and measurement of treatment outcome diminished the value of the vast majority of studies they reviewed. The authors considered that many were so flawed that they provided no useful information at all. Nevertheless, they did feel able to draw a number of conclusions:

1) No comparison showed behaviour therapy to be inferior to psychotherapy. Most showed that behaviour therapy was either marginally or significantly more effective than the alternative treatment.
2) There was no evidence of symptom substitution following behaviour therapy. For example, quoting

Sloane et al (1975) "not a single patient whose original problems had substantially improved reported new symptoms cropping up. On the contrary, assessors had the informal impression that when a patient's primary symptoms improved, he often spontaneously reported improvement of other minor difficulties" .

3) Behaviour therapy is more broadly applicable to the full range of psychological disorders than traditional psychotherapy.

4) Behaviour therapy is capable of producing broadly based treatment effects on specific target behaviour and related measures of general psychological functioning. A frequently voiced speculation is that behaviour therapy might have greater effects on symptom-outcome measures than on more important or fundamental processes related to general adjustment. This suggestion reflects the view that behaviour therapy is best regarded as a limited and relatively superficial form of treatment, useful as an adjunct to conventional psychotherapy. The data do not support this notion. Behaviour therapy was found to be applicable to a much wider range of human problems than verbal psychotherapy, and there was clear evidence of broad-gauged treatment effects across specific target behaviour as well as more general

measures of personal, social and vocational adjustment.

Comparative Outcome Research

So far, the chapter has reviewed research on psychoanalysis, insight-orientated psychotherapy and behaviour therapy. It has drawn attention to some of the difficulties and shortcomings of the research. Comparative studies are by design, inevitably more complex and therefore potentially harder to undertake and draw valid conclusions from.

The Sloane et al (1975) study has been credited as being the best controlled study of its kind and given high marks for methodology by a number of commentators (Bergin and Suinn, 1975; Luborsky et al, 1975; Rachman and Wilson, 1980). Ninety adult outpatients were randomly assigned to one of three treatments after being matched for sex and severity of disturbance. The treatments, carried out by experienced therapists were psychoanalytic psychotherapy, behaviour therapy or waiting list control. Treatment lasted four months and there was an eight month follow-up period. The ratings consisted of three primary symptoms, work, social and sexual adjustment. For the target symptoms, 50% of the control and 80% of the treatment groups improved or recovered. Behaviour therapy was

significantly superior on a global rating of improvement, work and social adjustment whereas the psychoanalytic psychotherapy resulted in only marginal improvement at work. At the one year follow-up there were no overall differences between the three groups. Whilst it is possible to undertake behaviour therapy in a four month period, it is difficult to see how four months of "psychoanalytic psychotherapy" could be considered more than "brief psychotherapy".

In the treatment trial reported in this thesis the "brief psychotherapy" offered was intended mimic the non-behavioural aspects of the Frewen regime, rather than be derived from any particular theoretical perspective.

Luborsky et al (1975) reviewed a number of what they considered to be the best comparative studies and found support for the notion that "Everyone has won and all must have prizes - Most comparative studies of different forms of psychotherapy found insignificant differences in proportions of patients who improved by the end of psychotherapy." However, there has been some criticism of his review and its conclusions. For example Rachman and Wilson (1980) criticised the selection of studies, commenting that it appeared only to include young, attractive, intellectual neurotic patients, not the wider population found in more run of the mill psychiatric settings. Not withstanding the bias the review also

included a small number of extremely atypical studies whilst specifically excluding behaviour therapy studies of treatment for conditions such as bed-wetting. Another criticism is the assumption that it is appropriate to lump all treatments either into the "psychotherapy" or "behaviour therapy" camp, regardless of the actual treatment adopted.

Luborsky et al (1975) attempted to grade the scientific quality of the studies and at the same time draw conclusions from those which they had identified as being poorly designed. This must call into question the reliability of some of their conclusions. Smith and Glass (1977) considered that there were some important shortcomings of the Luborsky et al (1975) review. The two main ones being the selection of studies for inclusion in the review and the voting method adopted to reach the conclusions drawn.

The Smith and Glass (1977) review was much broader than Luborsky et al (1975), including over 400 studies. The method of analysis also differed in that they adopted a meta-analysis and calculated an effect size for any type of outcome measure. They concluded that psychotherapy was efficacious and ranked various treatments in order of power. They considered that the outcome measures on the studies of behavioural therapies were more subjective and susceptible to bias than those from non-behavioural

studies. If this fact is taken into account then they claimed that there were no differences between the equally effective therapies.

Rachman and Wilson (1980) criticise the use of this novel method of analysis considering that the studies involved are too unreliable to warrant a sophisticated statistical approach. They advocate that given poor quality of research published a more traditional literature review is appropriate, in which aspects concerning scientific rigour, such as the inclusion, or not, of a control group are discussed. Although the Smith and Glass (1977) review covers a large number of original papers and theses Rachman and Wilson (1980) take exception to what they consider to be inclusion bias and cite an number of important inconsistencies. They also note that the review failed to take any account of the wide range of patients included.

Thus, for the most part comparative studies have not seriously contributed to the debate. The enquiry into the effectiveness or otherwise of psychotherapy first arose within the scientific sphere. However, more recently the issue has broadened and an editorial entitled "Psychotherapy in the market-place" (Wilkinson, 1984) draws attention to the wider aspects stating that "In reality, however, it has been political and economic factors which have proved to be the stimulus for most of

the recent interest in psychotherapy outcome research, especially that which produces positive findings. This was anticipated by Parloff (1979), among others, when it was appreciated that in times of economic austerity US policy decisions affecting the third-party reimbursement of psychotherapists would be based on research evidence; and, that research reports were likely to be interpreted not by 'research wise' individuals but by lay policy-makers, a prospect which was not greeted with universal acclaim. Parloff (1982) notes that "By the criterion of popularity in the market-place, the field of psychotherapy is ostentatiously successful; it flourishes and prospers. Practitioners multiply and consumers increase. Indeed, psychotherapy appears to have everything going for it except one - namely, credibility." This theme is echoed by Prioleau et al (1983) who concluded that "Thirty years after Eysenck (1952) first raised the issue of the effectiveness of psychotherapy, twenty-eight years after Meehl (1955) called for the use of placebo controls in psychotherapy, eighteen years after Brill et al (1964) demonstrated in a reasonably well-done study that the psychotherapy effect may be equivalent to the placebo effect, and after about 500 outcome studies have been reviewed - we are still not aware of a single convincing demonstration that the benefits of psychotherapy exceed those of placebos for real patients".

Psychosomatic Outcome Research

Research relevant to micturition disorders is fully discussed in the literature review (chapter two) and this section will only address the more general aspects of outcome studies of psychotherapy for patients with physical disorders.

Conte and Karasu (1981) reviewed the findings of 18 controlled studies of the use of dyadic and group therapy as primary or adjunctive treatment for patients with a number of psychosomatic disorders and concluded that there were some significant gains achieved when psychotherapy was added to routine medical regimens. For example, of the 13 studies whose designs were rated as adequate or good, eight showed greater physiological improvement in patients receiving individual or group therapy than in patients receiving medical management alone. The authors point to a number of particular difficulties when conducting research in this field.

There is the real problem of providing appropriate control groups, particularly for therapy that can be relatively long term. Random assignment to a regimen of psychotherapy with or without medical management is not always possible. There are ethical issues to be considered if some of the sample exhibit some degree of psychological disturbance. Waiting list controls are

subject to the same ethical strictures. On the other hand, patients who regard their disorder as exclusively organic are likely to repudiate vigorously an approach postulating that psychological factors influence the onset and progress of the disease. It will neither be appropriate or useful to administer psychotherapy to such unmotivated patients.

Psychotherapy is often resistant to standardisation for research purposes, with therapeutic procedures differing from investigator to investigator. This means that it can be difficult to compare and replicate studies. However, to some extent, the difficulties can be mitigated and attempts were made to do it in this present study by standardising treatments as described in the chapter on methodology. At the least, investigators should provide enough detail on procedures to allow studies to be meaningfully compared.

The use of appropriate outcome measures is important. In addition to assessing the change in physical condition there needs to be a measure of the psychological state, using standardised and valid measures. With reference to the treatment trial, this theme is considered further in the chapter reviewing the methodology of trial.

Summary

This chapter has reviewed some of the problems of therapeutic outcome research, with particular relevance to issues pertinent to the research presented in this thesis. Throughout the thesis and especially in the chapters discussing the results, attention is drawn to the problems of outcome studies within this area of medicine.

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CHAPTER FOUR

URODYNAMIC METHODS OF ASSESSMENT

Introduction

The purpose of this chapter is to review the clinical tests for micturition disorders.

The ***history*** should include questions about symptoms of urinary frequency, urgency, incontinence and nocturia as well as a systematic enquiry. ***Physical examination*** of the gynaecological-urology patient involves a full pelvic examination including a detailed assessment of the S2, 3, 4 nerve roots. If detrusor hyper-reflexia is suspected then a full neurological assessment is carried out.

A ***urinary diary*** will give an indication of the severity of the condition, particularly if episodes of incontinence are recorded. If the maximum functional capacity of the bladder is obviously reduced then cystoscopy to measure the capacity under anaesthetic is appropriate. Cystoscopy should also be carried out if there is any evidence of haematuria, or recurrent pyuria to exclude bladder tumours or interstitial cystitis. An intra-venous urogram is not indicated unless a neuropathy or voiding difficulty is encountered when evidence of reflux nephropathy may be found. This should be confirmed by a micturating cystogram.

Special Investigations

Aside from questions of clinical safety, cost and availability, the usefulness of clinical tests can be measured in terms of ***sensitivity*** and ***specificity***.

A ***sensitive*** test is one which identifies within a group all those who have the condition under investigation, and will thus have a low false negative rate. A ***specific*** test is one which is diagnostic for the condition, and thus has a low false positive rate.

Tests may also be defined on the basis of the action taken when the results are received. Three types are recognised: ***screening***, ***diagnostic*** and ***prognostic***.

A ***screening*** test should be highly sensitive for the condition. It identifies a group at higher risk of having the condition, but is not by itself diagnostic.

A ***diagnostic*** test indicates the presence or absence of the suspected condition, but does not necessarily give a quantitative result as to its severity. A positive diagnostic test is pathognomonic of the disease. The action following a positive test is to assess the severity of the condition either clinically or by means of a further test. If this assessment is clinical then the course of the disease and its response to treatment are monitored clinically. If however, it is by means of a further test, then the course of the disease may be

monitored by repeating the test at various intervals during the course of treatment.

A ***prognostic*** test gives a grading of the severity of the condition, and on the basis of past experience, indicates a rational treatment method with predictable outcome. Repeated testing allows the course of the disease, and its response to treatment, to be monitored.

The special investigations used in patients with micturition disorders will now be reviewed with reference to the above considerations.

Cystometry

Two channel cystometry is the central investigation for patients attending the urodynamic clinic. It is an invasive procedure in which a narrow catheter and pressure transducer are introduced into the bladder via the urethra. The bladder is slowly filled with normal saline. The saline reservoir is hung on an electronic balance and the volume of fluid introduced is calculated from the weight remaining. A pressure transducer is also introduced into the rectum to record the intra-abdominal pressure. After standardisation of the recording equipment it is possible to calculate the detrusor pressure by subtracting the intra-abdominal pressure from the intravesical pressure. As the bladder fills the

patient is asked to press a button attached to an event marker at the first sensation of bladder fullness. The bladder is then filled to maximum capacity. The consequent pressure changes are recorded on a chart recorder.

During normal filling the bladder volume increases without any significant rise in pressure. No involuntary detrusor contractions occur despite provocation (such as coughing or the sound of water running from a tap). If the detrusor pressure rises to 15 cms of water then the diagnosis of detrusor instability (DI) is made. If it is less, cystometry is regarded as normal and a diagnosis of sensory urgency (SU) is made. The catheter is removed and the peak flow rate is measured.

(Note: The introduction describes the precise methodology of cystometry as used in the clinic survey and treatment trial.)

The following measurements are recorded during each urodynamic assessment:

1) The peak free flow rate and the volume voided during that void.

2) Residual urine volume

3) The volume of saline which has been instilled into the bladder when the first desire to void is experienced.

4) The maximum cystometric capacity.

5) The presence or absence of leakage in response to coughing.

6) The maximum pressure found during any involuntary detrusor activity during bladder filling.

7) The maximum pressure found during any involuntary detrusor activity during provocation by position change and coughing.

Defining an abnormality on the basis of the results of a test artificially ensures that the test is both diagnostic and highly specific for that condition. Since the results are expressed in terms of continuous variables it is also intuitively accepted that cystometry can be used to both grade the severity of the condition and monitor its response to treatment. Unfortunately the symptoms of DI, (frequency, nocturia, urgency and urge incontinence) and their response to treatment correlate poorly with the results of the test (Holmes et al 1983).

Fifty-five per cent of women who complain of urge incontinence (Cantor and Bates 1980) and 70% who complain of urgency (Abrams 1983) have no evidence of DI. 55% of women with genuine stress incontinence (GSI) also complain of urge incontinence (Cardozo and Stanton 1980) whilst 10% of people with the cystometric diagnosis of DI are reputed to be asymptomatic (Turner-Warwick 1979). A prediction of

the cystometric diagnosis made by an experienced clinician from the history and examination is only correct for 65% of women (Jarvis et al 1980). He describes the bladder as an "unreliable witness" since the correlation between the clinical diagnosis and the cystometric diagnosis is poor.

Since DI cannot reliably be distinguished symptomatically from SU, cystometry is an insensitive test for the abnormality associated with the symptoms of urgency and urge incontinence.

Two possibilities exist to explain this anomaly. The first is that DI and SU are different conditions. Cystometry can only demonstrate the presence of DI, and, in this situation, SU is a diagnosis of exclusion since no specific test is available.

The second explanation is that SU and DI are, in fact, both manifestations of the same condition, the difference being due to the relative insensitivity of cystometry in detecting the underlying abnormality. Unstable contractions during provocative cystometry would only identify a sub-group within those people who have an abnormality of the lower urinary tract function.

In general, DI is a benign condition for which the plethora of treatments available indicates that the models on which the treatment rationales are based are inaccurate. Symptomatic treatment of DI is limited by the

lack of an accurate model of the pathogenesis of urgency. Since measurement of intravesical pressure is relatively insensitive in detecting an abnormality in women with urgency, it is unlikely that the sensation of urgency is related only to pressure rises within the bladder. If the model that urgency and urge incontinence are symptoms of a single condition which manifests itself during cystometry as DI or, by exclusion, SU, then cystometry is not a sensitive enough test to indicate the abnormality producing the sensation of urgency. If it is accepted that involuntary detrusor pressure rises are usually associated with urgency (Cardozo 1984), then either more provocative cystometry or more prolonged monitoring of detrusor function should be used to demonstrate involuntary detrusor activity, and thus improve correlation with symptoms in those whose conventional cystometry is normal.

If it is accepted that the more provocative the test the more sensitive it becomes, then not only will the detection rate in the symptomatic group increase but possibly it will increase in the asymptomatic group, thereby decreasing the specificity of the test.

Continuous Monitoring

The technique of continuous monitoring of detrusor function by telemetry (James 1979) increases the detection rate of involuntary contractions in symptomatic women who have normal cystometry. This changes their diagnostic category to that of DI. Using this technique of ambulatory monitoring on 320 incontinent women, 43% had incontinence due to involuntary detrusor function. This shows an increase in the rate of detection of DI from 36.5% quoted for the investigation of 800 incontinent women by cystometry (Cardozo 1984) thus indicating an increased sensitivity for the test when compared with cystometry. Involuntary detrusor contractions are usually associated with the sensation of urgency and so the sensitivity and specificity of the test with regard to symptoms are also improved.

Videocystourethrography

Patients with GSI may be investigated by means of videocystourethrography (VCU). In this procedure the bladder is filled with a radio-opaque dye. The patient coughs and then urinates under X-ray screening. The results are recorded on video tape. Since the cystometric technique is the same in both videocystourethrography and cystometry, no additional information regarding detrusor

function can be gained. Abnormalities of structure such as diverticulae or trabeculation may be detected, as may abnormalities of vesico-ureteric function (reflux) or vesico-urethral function (bladder-neck/urethral incompetence).

A number of other tests have been developed in an attempt measure urine loss and investigate GSI. ***Pad testing*** (Sutherst et al 1981, Walsh and Mills 1981) allows the quantification of urine loss in response to physical activity over a fixed time period. The test is defined by the International Continence Society and includes representative activity such as standing from sitting, running on the spot, coughing and washing hands under running water. Although simple and non-invasive it has a number of disadvantages such as giving no indication as to the cause of the leakage.

In the ***Urilos*** test the electrical conductivity of a pad is recorded over a set time period. The system has been shown to be sensitive to detecting incontinence (Flack and James 1975, Robinson and Stanton 1981). It has also been assessed clinically to determine the relationship of the characteristics of urine losses in relation to urodynamic diagnosis (James and Niblett 1984). In this study, characteristic leakage patterns were

obtained which allowed some differentiation between stable and unstable bladders to be made on the basis of the Urilos test only.

Urethral pressure measurement is a useful research tool and gives considerable information on the nature of GSI (Hilton and Stanton 1983) and the method of action of continence procedures (Hertogs 1985). The results at present however, show that it is neither a sensitive or specific test for GSI (Hilton and Stanton 1983, Tapp et al 1985, Shepherd et al 1985), and may be omitted from the routine investigation of incontinence (Blaivas et al 1982).

Summary

Assessment of detrusor activity by measuring intra-vesical and intra-abdominal pressure is extremely useful in the management of lower urinary tract dysfunction. Cystometry as a screening test for involuntary detrusor activity has a relatively low sensitivity and specificity in detecting an abnormality associated with both urgency and urge incontinence. Ambulatory monitoring of incontinent women has been shown to increase the detection rate of involuntary contractions. However there still remains a group of women who have urgency symptoms but in whom no abnormal pressure rises can be detected.

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CHAPTER FIVE

PSYCHOLOGICAL RATING SCALES

Introduction

This chapter reviews methodology and discusses possible alternatives and the rationale for the final choice of design. The shortcomings of the instruments used are also discussed.

In order to effectively test the hypotheses outlined on page 8 the overall design and methodology warrants comment. A two stage approach was adopted, the clinic survey being a necessary first step whilst, the treatment trial depended on the presumed relationship of psychological influences on micturition and the findings of an abnormal mental state.

The hypotheses do not set out to directly test the question of causality of DI or SU. The remit is more modest and circumspect: First, to investigate the psychological state of patients with micturition disorders and second, to investigate the possible impact of psychological treatments. To this end, a reliable and objective measure of symptomatology is required. Chapter one outlines the clinical measures taken to make a urodynamic diagnosis in accordance with internationally agreed criteria. Possible alternative methods of urodynamic investigation are critically discussed in chapter four. The other essential aspect of both the

clinic survey and treatment trial was a documentation of the patients mental state.

Psychological Measurement

In some ways, this aspect of the work was more open to judgement and compromise than the urodynamic measurements. In addition to the need for validity and reliability, for the treatment trial the measures also needed to be sensitive to change. The clinical and practical considerations also had to feature in the equation. The chapter on the review of the literature comments on the paucity of scientific studies in this field. This fact adds another important consideration: how will the findings of this work compare with previous investigations? Thus, the final choice became a balance between a number of competing factors. These issues are commented on as individual instruments are discussed.

As far as was possible to tell, the patient population were only selected for referral to this tertiary clinic on the basis of their urinary symptoms. Thus, to a greater or lesser degree, they were a cross-section of the population in terms of demographic features, intellectual ability and psychological functioning. Instruments chosen needed to take this into account. Standardised measures were needed, ideally ones that were well known and widely

used. Findings would be easier to interpret, if this were the case.

The information given by rating scales is valuable because it is easily quantifiable and comes in a standard form. Each patient is asked for the same information in the same way and the results are given numerical indices. Comparisons are easy to make. Psychodynamic formulations were not considered appropriate for this work: the reasons are outlined in the chapter on therapeutic outcome research.

Rating scales should be clearly designed for a purpose and to this end four can be identified (Hamilton, 1974):

1) diagnosis and classification,
2) prognosis,
3) prediction of response to treatment and differential indicators for treatment
4) measurement of the severity of illness and its response to treatment.

It is unlikely that any one scale would be equally useful for all these purposes. For the clinic survey, diagnosis and classification were particularly important, and for the treatment trial the measurement of the severity of illness and its response to treatment the most important.

In addition to these four functions, the ability of the rating scale to measure what it purports to is an important consideration. The validity of a scale may be defined as the relation between the scores on the scale and the quantitative value of the phenomenon (variable) which is being measured. There are a number of aspects to validity. The concurrent validity of a scale is concerned with the relationship between that scale and others having the same function. It is measured by the correlations between the scores on one scale and others all given under the same conditions and in the same circumstances. As referred to earlier, there is very little research published on the psychological aspects of micturition disorders and it was therefore considered particularly important to measure this aspect of validity.

An example of construct validity is the ability of the scale to show that it can differentiate clearly between different groups such as "normal" and "ill". Less crude and more useful would be to reliably grade the phenomenon measured. The instruments finally chosen for the work varied in their ability to do this.

Reliability may be defined as the amount by which random factors interfere with the accurate measurement of the scale. It is as complex a problem as validity and there are a number of different indices of reliability in common use. Inter-rater reliability is determined by

arranging for two or more raters to assess a series of patients at the same time and in the same way. The correlations between the scores of the different raters measure the inter-rater reliability. By the nature of their design, in this respect, self-rating scales are better than observer completed rating scales.

Test-retest reliability can be measured by correlating the results of testing on two separate occasions. It will usually be less than inter-rater reliability because, in addition to the sources of error inherent in the raters, the patient's condition will also fluctuate from one occasion to the next and this will diminish the correlation. In order to measure the split-half reliability the scale is cut into two halves, each of which contains parallel items, and the correlations between the scores of these two half are calculated.

In addition to reliability and validity there are other important considerations when deciding whether a rating scale is suitable or not. If all scores collect either at one end or other of the scale then it is difficult to differentiate between individuals. Grades must be distinguishable and the number will depend on the variable under consideration. Some variables are easier than others.

Items should be definable and this means that different raters should have no difficulty in agreeing on the precise subject-matter of ratings. Thus, it is inherently easier to design a scale for observable behaviour than psychodynamic formulations. Items should be concerned with symptoms or other variables which occur sufficiently frequently in the sample being assessed. Rare items can be regarded as being irrelevant and, therefore, their principle effect on the total score of the scale is to diminish its reliability.

Observer rated scales have special problems in addition to those already discussed generally. However, the use of a skilled and experienced rater allows the measurement of variables with greater sophistication and sensitivity. Also, a variable such current mental state can be measured by an observer in a way that is just not possible otherwise. By careful design and training, the reliability and validity can still be satisfactory.

Other design and procedural difficulties include the following: The scoring of items independently means that any aspect of behaviour which is included in one item should not be included in another. There are four "constant errors". The error of leniency describes a reluctance of the rater to use extreme scores. The halo effect describes the tendency for a rater, having given a high score on one variable to give high scores on others

and vice versa. The logical error is based on a tendency to give high or low scores where these seem sensible or implied by the nature of the material. The error of proximity describes a tendency to give similar scores to adjacent items. Bias is another constant error in which raters always give scores in the mid range or at the extremes. Some raters may mark subjects up or down at the beginning or end of a trial. This sort of bias can be one explanation for the improvement in patients on placebo treatment.

So far this chapter has discussed the use of rating scales for the measurement of variables. Hand in hand with the consideration of the most appropriate rating scale is the consideration of data handling.

Levels of Measurement and Data Analysis

The nominal is the weakest level of measurement. Numbers are used to classify behaviour into different classes, without implying that one class is numerically related to any other (such as types of incontinence). Ordinal measurement reflects the order of items on a particular attribute, but not their separations on a scale. In the treatment trial for example, the measurement of incontinence is an ordinal measurement.

Interval measurement refers to the ordering of items and to the relative separation of the items on the scales (for example, temperature). A ratio measurement is the same as an interval measurement but with a true zero point. For example, bladder capacity is a ratio measurement.

However simple or complex the trial, ultimately the results depend on comparing pairs of scores, such as pre and post treatment or subject and normal controls. There are four ways of using a pair of scores for measuring the change in the patients condition (Hamilton 1974).

1) Use of the final score only. Randomisation of the patients among the treatments will in general ensure that the mean score of the patients before treatment will be approximately the same in all the groups. It is not necessary, therefore, to do more than examine the mean score of the groups after treatment and to test statistically the differences between them.
2) Difference scores are obtained by subtracting one of the scores from the other. This is a popular method of estimating change but the disadvantage of this index is that it tends to have a high error variance.
3) Ratio scores consist of the ratio of the final score to the initial score, sometimes expressed as a percentage. This index is relatively unpopular but it has one advantage in that it gives a measure of responsiveness, i.e. sensitivity to treatment, as

opposed to amount of response to treatment.

4) The method of analysis of co-variance takes into account the original scores of the patients before analysing the final scores. It is generally considered to be one of the best methods, because it uses all the data available. The methods used in this research were of the analysis of co-variance type and are described in detail in the results section.

Parametric tests involve the calculations of means and standard deviations and thus take advantage of the extra information about numerical relationships between the data. Such data must, therefore be of the interval or ratio type.

Design of Clinic Survey

Practical considerations meant that the clinic survey had to fit in with the general running of the unit. The clinical diagnoses where reached on the basis of history, examination and appropriate special investigations. New patients could only realistically be seen in the setting of a busy outpatient clinic.

Data presented in the chapter on previous work suggested that any psychological disturbances would be predominantly of a neurotic nature. Thus, anxiety and depression would be important symptoms to rate as well as

a measure of personality (should that prove possible). However, the relationship of "psychosomatic illnesses" to mental functioning in general and the response of the individual to "stress", particular personality types, presence or otherwise of neurotic symptoms remains speculative. The choice of rating scales could well pre-judge the outcome of this debate and lead to inconclusive findings, simply because the basis of the relationship of the urinary symptoms to the mental state was misunderstood.

Due to the fact that there are so few studies on the mental state of women with urinary disorders it was particularly important to use well known instruments which would allow conclusions to be drawn with the greatest degree of certainty possible, even if this was at the expense of comprehensiveness. To this end, priority was given to the symptoms of anxiety and depression.

The following discussion outlines the relative advantages and disadvantages of some of the scales that were likely to meet the requirements of the study. An important decision was the choice to be made between observer rated scales and self rating scales. Although a number of observer rating scales would have been suitable emphasis in the discussion is given over to self rating

scales. From a practical point of view, self rating scales would be easier to administer, given the number of patients that were invisaged would enter the study. As will become apparent, there are a number of self rating scales which meet or exceed the requirements of this study.

Anxiety Rating Scales

The Spielberger state/trait anxiety inventory (STAI) is one of the most widely used self rating scales. Its reliability and validity is extremely high. Considerable comparative data exists and thus, it presents as a most useful instrument for the measurement of anxiety. For example, Knight et al (1983) provide some norms for the STAI based on over 1000 subjects in a New Zealand suburban population. They reported an alpha coefficient for the A-state as .93 and for the A-trait as .87. Alpha measures the correlations between items, indicating the extent to which they can be considered to measure the same underlying variable. Cronbach (1951) advises that, for research purposes, an alpha of ≥ 0.5 is acceptable.

Depression Rating Scales

In a review on the use of depression rating scales, Carroll et al (1973) noted that a number of depression rating scales have been developed but that their relative performances have not been well studied and the choice of

rating scale is often arbitrary or determined by local custom. In addition, the scales are commonly used by investigators without consideration of whether the reliability and validity originally claimed for them apply to the patient sample being studied. The authors concluded however, that self rating scales were useful for case-finding and that others (eg Prusoff et al 1972) had reached the same conclusions.

The Hamilton Rating Scale for depression (Hamilton M 1960) is an observer rated scale and was compared by Carroll et al (1973) to the Zung Self-Rating Depression Scale (Zung, 1965). They concluded that the Zung scale was not suitable for use in research studies, mainly because it did not distinguish between sub-groups and that it neglected some of the behavioural and somatic features of depressive illness. They also noted that some patients took up to twenty five minutes to compete it and that for many patients it had to be handled in the "interview assisted" manner of the Beck Depression Inventory. The Wakefield Self-Assessment Inventory was a development of the Zung scale and contains ten of the original twenty items and two more dealing with psychological anxiety. The authors specifically noted that it correlated very well with the Hamilton Rating Scale. Thus, it merited serious consideration for use in the clinic survey. The authors report a test-retest reliability of 0.68 and noted

that all items contributed to the total score. Following treatment, with the exception of one item on insomnia, patients tended to have lower scores on all items. The combination of brevity, reliability and validity made it the most suitable choice for the survey and treatment trial.

Personality and Screening Inventories

The major aim of the clinic survey was to measure aspects of neurotic symptomatology. The Spielberger and Wakefield scales proved to be satisfactory choices for this purpose. However, there remained the question of personality factors in patients with urodynamic disorders. Additionally, it would be helpful to know how the results of this survey compared with results obtained elsewhere. There are a number of important personality inventories (such as the and Eysenck Personality Questionnaire) that would potentially be suitable. There are also a number of screening questionnaires, notably the General Health Questionnaire which could also have be used in the clinic survey.

The Crown-Crisp Experiential Index, previously known as the Middlesex Hospital Questionnaire, is a self-report inventory whose items refer both to symptoms and to personality traits and is designed to measure clinically recognised psychoneurotic disorders. It consists of 48

questions divided equally into six subscales which purport to measure specific types of neurotic behaviours: Free-Floating Anxiety, Phobic Anxiety, Obsessionality, Somatic Anxiety, Depression and Hysteria. In addition, a total score can be obtained to provide a measure of general emotionality or Neuroticism. It was designed for research and screening purposes in order to obtain a quick approximation to the diagnostic information that would be gained form a formal psychiatric interview. It has found application in areas of eating disorders and psychosomatic research. In particular, it has been used in a number of studies on patients with micturition disorders (e.g. Hafner et al 1977, Freeman and Baxby 1985 and Rees and Farhoumand 1977).

The reliability characteristics of the CCEI subscales have been investigated by Alderman et al (1983) and Knight et al (1983) with the general finding of satisfactory levels of internal consistency (as indicated by Cronbach's alpha coefficient) for the subscales Free-Floating Anxiety, Phobic Anxiety, Depression and Somatic Complaint: each of those subscales has alpha coefficients greater than 0.50. The subscales Obsessionality and Hysteria do not achieve those levels and it has been suggested that the items which comprise those particular subscales are heterogeneous with respect to the constructs which they purport to measure. Since the reliability is related to

the number of items which comprise a scale, the strength of the CCEI afforded by its relative brevity may preclude alpha coefficients reaching the levels usually expected for satisfactory internal consistency. However, it has been established that the first five subscales of the CCEI (i.e. excluding the Hysteria subscale) can discriminate between individuals who differ in the presence of absence of clinical levels of "neurosis". There is also evidence that the CCEI can register a gradient in the rate of psychiatric symptomatology from normals to psychiatric in-patients. (eg. Crown & Crisp, 1966, Mavissakalian & Michelson, 1981). Burgess et al (1987) again drew attention to the limited usefulness of the Hysteria and Obsessionality subscales but concluded that it was a useful screening instrument and that its particular strengths were its simplicity and brevity. As a screening instrument, it could be used as a substitute for part of the psychiatric interview and was a convenient aid in the measurement of clinical improvement.

Thus, inspite of the shortcomings already referred to it was decided to use this questionnaire as it afforded the opportunity to compare results with other workers, check validity and provide a measure of psychiatric morbidity. Its ease of use and the short time required to complete it were also important considerations.

Visual Analogue Scales

To date, there has not been any report in the literature of assessment of patients attitudes towards their urinary symptomatology. Stanton (personal communication, 1984) noted that some patients appeared to cope better than others with apparently the same level of symptomatology and disability. This suggested that it was appropriate to at least attempt to document in a systematic way patients attitudes towards their symptoms. To this end, a visual analogue scale was constructed to record the perceived interference in life that the patients considered to be caused by the urinary symptoms. For similar reasons expectation of treatment was recorded in the same way. The the conclusions that can be drawn from such data is limited. This is discussed further in the appropriate results chapter.

Summary

This chapter has reviewed the range of possibilities for measurement of the psychological aspects of this research. It has highlighted the compromises and reasons for the final choice. The methodology of the clinic

survey is described in the next chapter and the methodology of the treatment trial in chapter nine.

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CHAPTER SIX

METHOD OF CLINIC SURVEY

Introduction

The literature review (chapter two) referred to the possible relationship between the psychological state and urinary symptoms. This clinic survey was designed to elucidate the mental state of patients presenting to the Urodynamic Clinic at St George's Hospital, Tooting, London. The instruments used were carefully chosen for their relevance, validity and reliability, as discussed in chapter five.

Patients were referred by general practitioners or from other hospital clinics. In the main, they had symptoms of incontinence, frequency, urgency and nocturia.

Method

Between June 1983 and March 1984 three hundred and seventeen patients attended the Urodynamic Unit. All were asked to fill in questionnaires to measure their mental state prior to being assessed by the urodynamic team. The purpose of the questionnaire was explained to the patients and on the whole they were pleased to co-operate. 211 patients completed the questionnaires and are evaluable. 106 did not fill in the questionnaire for the following reasons:

Demented or not able to comprehend the questions	70
Multiple Sclerosis	12
Language problems	8
No reading glasses with them	11
Refused to fill in questionnaire	5
Total	106

Questionnaires

Patients were asked to rate themselves symptomatically both generally and specifically for the day of the clinic attendance using visual analogue scales.

Expectation of treatment was measured, again using visual analogue scales (see appendix A). The questions were as follows: "Generally, how helpful do you think treatment will be for you?", "Generally, how useful do you think treatment will be for you?", "Generally, how successful do you think treatment will be for you?" In each case, patients were asked to mark the visual analogue scales which had "no help" (or useful or successful) at one end and "very helpful" (or useful or successful) at the other. The range of each scale was 1 to 8. An "expectation of treatment" score was calculated by adding the three scores together.

Spielberger State/Trait Anxiety Inventory (Spielberger, Gorsuch and Lushene 1970). This

questionnaire was in two parts. The first measured state anxiety referring to a particular time, in this instance when filling in the questionnaire. The second part measured trait anxiety and referred to this emotion in a more general sense.

There were twenty questions in each section with a choice of four replies for each. The responses were scored from one to four, with the response indicative of raised anxiety scoring highest (see appendix A).

Wakefield Depression Scale (Snaith, Ahmed, Mehta and Hamilton 1971).

This was a twelve question self-rating scale. Each question had a choice of four replies, scoring 0 to 3 (see appendix A).

Crown-Crisp Experiential Index (Crown and Crisp 1966). This self-rating scale provided a psychoneurotic profile on six subscales. These were anxiety, phobic anxiety, obsessionality, functional somatic complaint, hysteria (said to be a measure of sociability (Crisp 1977)) and depression (see appendix A).

The questionnaires took 30 to 45 minutes to complete. The patient was then assessed by the urodynamic team. Record was made of the nature and duration of the symptoms, and a physical examination was carried out. All patients were asked to provide a mid-stream specimen of

urine (MSU). Some, if clinically indicated, underwent further investigation by means of cystometry or video-cystourethrography. Patients were allocated to one of the following diagnostic categories:

1) Detrusor Instability.

2) Sensory Urgency. (Symptoms of urgency, frequency or nocturia with normal cystometry).

3) Genuine Stress Incontinence.

4) Mixed Diagnosis: Genuine Stress Incontinence and Sensory Urgency or Detrusor Instability.

5) Other Diagnosis.

The raw data (age, symptoms and their duration, urodynamic diagnosis, questionnaire scores) were transferred to punch cards for analysis on the University of London Mainframe Computer.

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CHAPTER SEVEN

RESULTS OF CLINIC SURVEY

Diagnostic Category

The patients were allocated to a diagnostic category on the basis of history, clinical examination and special investigations such as cystometry. The results are presented in figure 7.1.

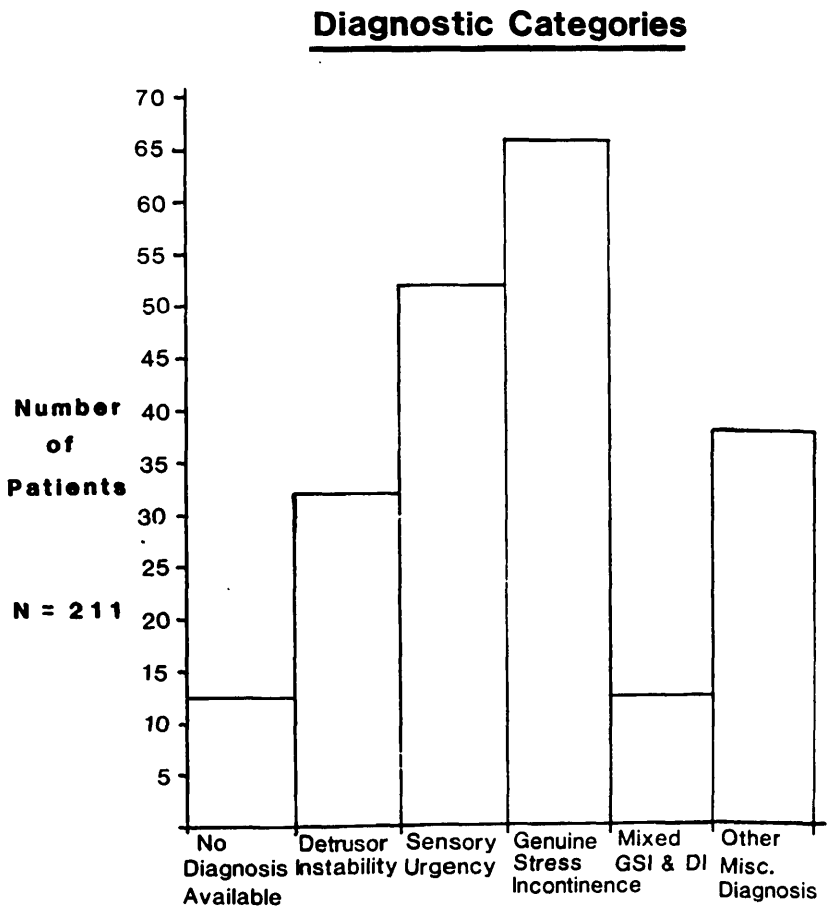

Figure 7.1

The most frequent diagnosis was Genuine Stress Incontinence (GSI) (66 patients, 31% of the sample). Of the remainder, most had symptoms of urgency, frequency, urge incontinence and nocturia. 52 patients (25% of the sample) had Sensory Urgency (SU) and 32 patients (15% of the sample) had Detrusor Instability (DI). 12 patients (6% of sample) had a mixed picture of GSI and either SU or DI. 37 patients (18% of the sample) did not have a primary urodynamic diagnosis, but had urinary symptoms secondary to other conditions such as multiple sclerosis. Twelve patients failed to keep appointments for investigations or follow up, and so it was not possible to make a diagnosis.

The main statistical analysis considers only the 150 patients with GSI, DI, or SU (excluding mixed diagnosis).

Age

The mean age of the 211 patients was 46.6 years (range 15 to 79 years). The age distribution is presented in figure 7.2.

	Mean Age (years)	Range	Standard Error
Detrusor Instability	46.0	15 - 67	2.52
Sensory Urgency	43.75	21 - 67	1.94
Genuine Stress Incontinence	50.06	25 - 71	1.46

Figure 7.2 Age of Clinic Survey Patients

Patients with GSI were significantly older than those with SU. (Scheffes test p=0.04). However, if patients with DI and SU are considered as one group there is no significant difference between them and patients with GSI.

The questionnaires measuring psychoneurotic profiles have normative data for different age groups. The comparisons with normal populations used the nearest age match possible.

An analysis was performed to test for any correlation between age, diagnosis and outcome variables. With one minor exception (hysteria sub-scale of CCEI - see below) disparity in psychological profiles could not be explained on the basis of age differences.

Duration of Symptoms

As part of routine history-taking patients were asked to estimate the duration of their urinary symptoms. 64% reported symptoms for two years or more, 16% one to two years and 20% less than one year. There was no difference between the diagnostic categories in duration of symptoms.

Subjective Severity of Symptoms

Patients were asked two questions about the subjective severity of their symptoms. First, they were asked how bad their bladder difficulties were on the day they filled in the questionnaire. The results are presented in figure 7.3. The majority reported that it was an average day for them. Thus, the day on which they attended outpatients and filled in the questionnaire was representative in terms of severity of symptoms.

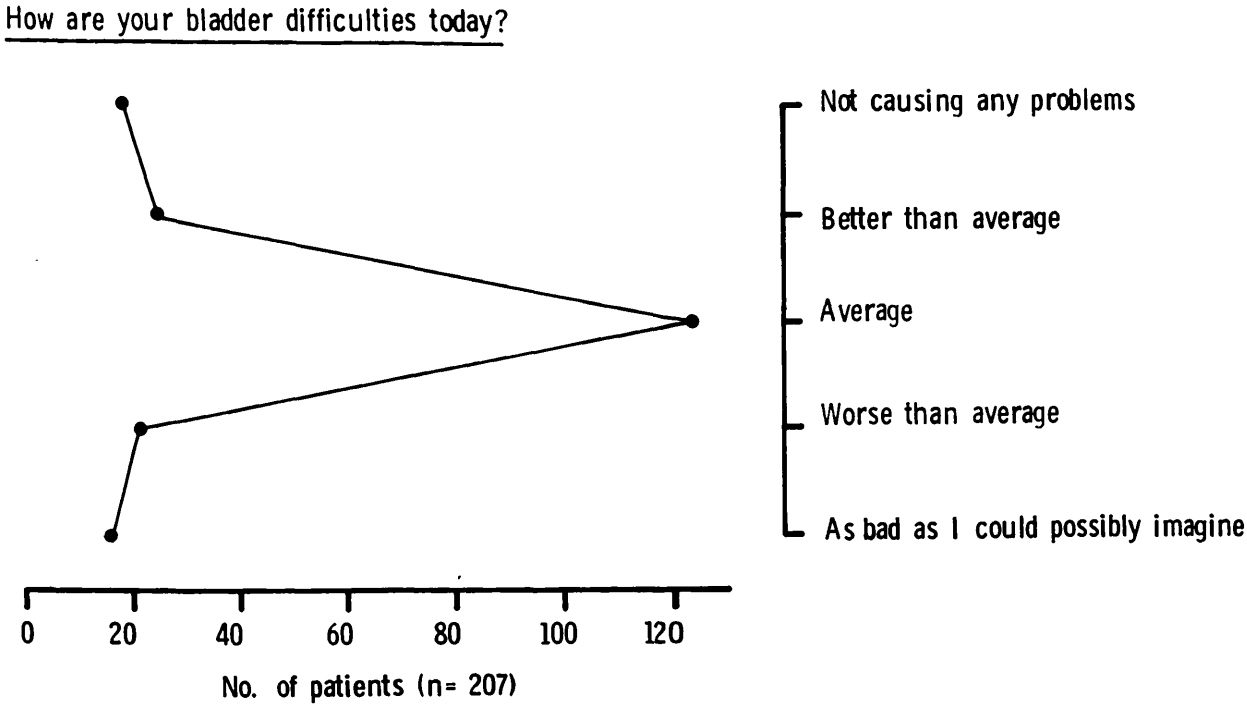

Figure 7.3

The second question asked "generally how troubled are you by your bladder problems?" The question was presented as a visual analogue scale with the phrase "not troubled

at all" at one end and "makes life not worth living" at the other. The results are presented in figure 7.4.

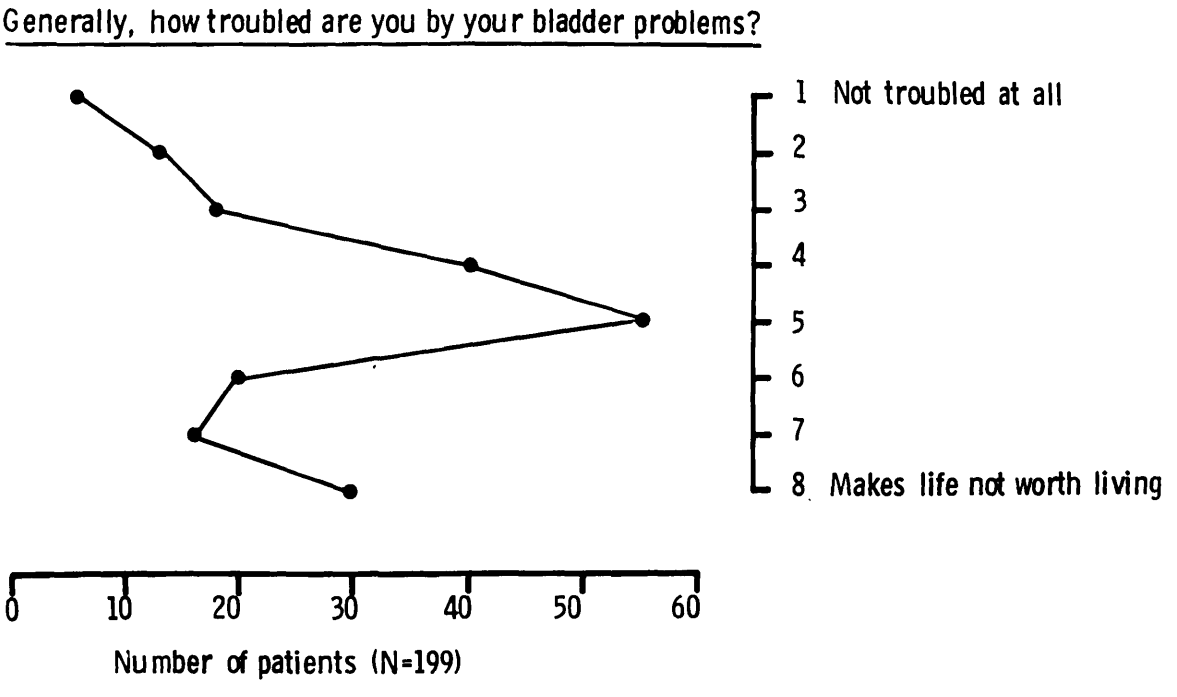

Figure 7.4

Twelve patients refused to answer this question. Nearly half the patients opted for a mid point on this scale: 95 patients out of 199 scored four or five on a scale from 1 to 8. There was no difference between the groups, as shown in figure 7.5.

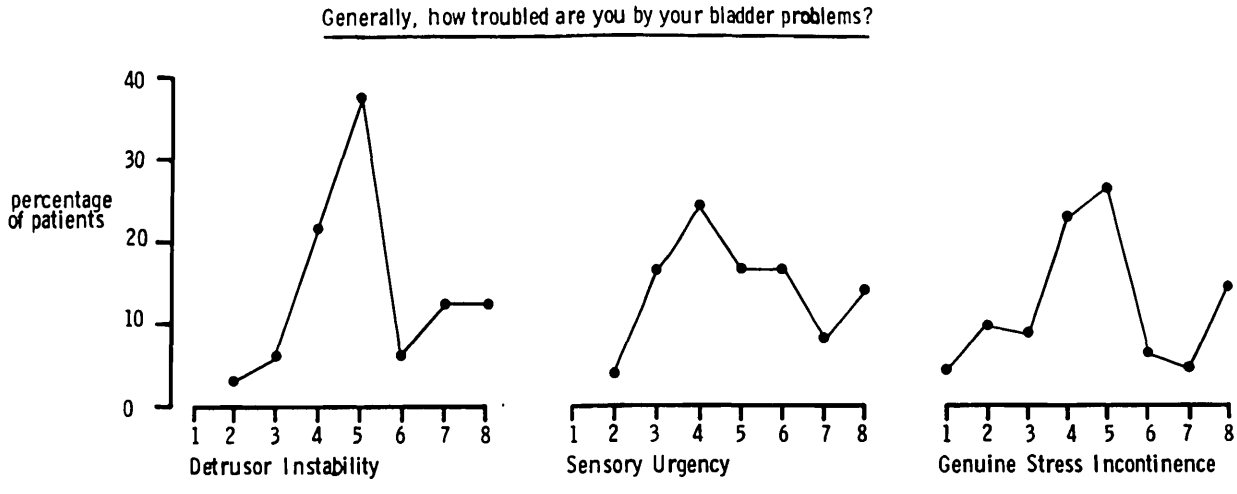

Figure 7.5

Seventeen of the 211 scored 7 and thirty scored 8 - their symptoms made life not worth living and included here are 8 patients with DI, 11 with SU and 12 with GSI. This subset was additionally analysed as a separate group and is referred to as subgroup A.

Expectation of Treatment

The results into the enquiry about expectation of treatment are presented as follows:

1) Generally how helpful do you think treatment will be for you? (figure 7.6).

2) Generally how useful do you think treatment will be for you? (figure 7.7).

3) Generally how successful do you think treatment will be for you? (figure 7.8).

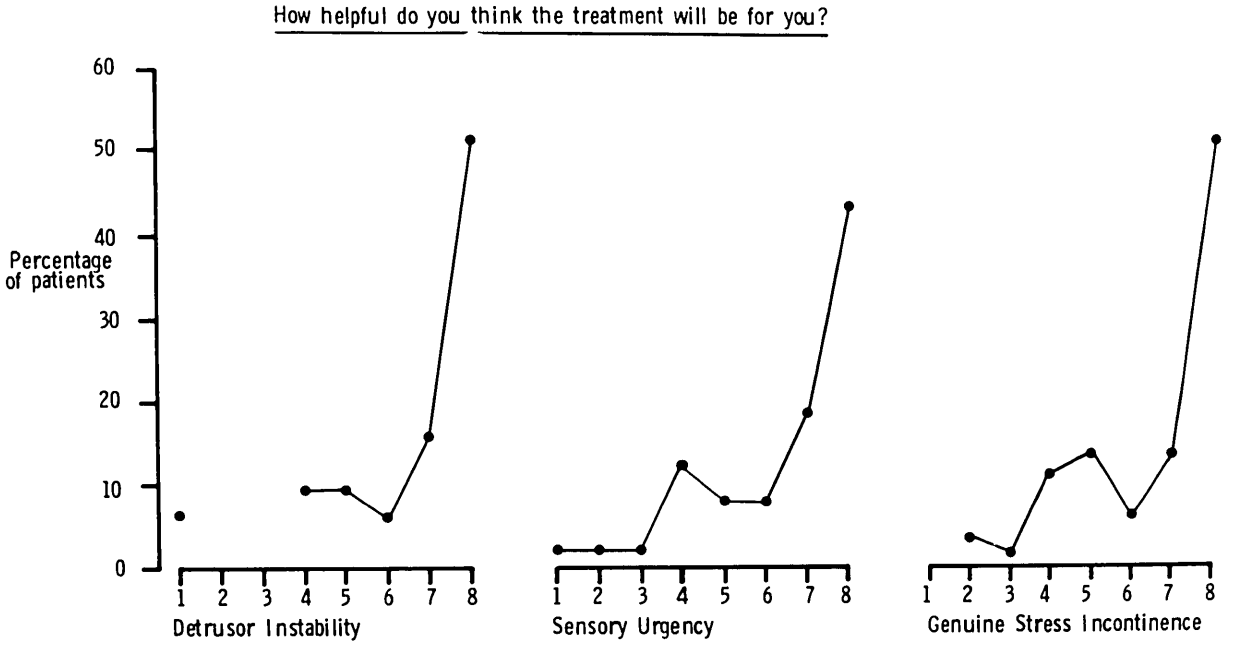
How helpful do you think the treatment will be for you?
60
50
40
Percentage of patients
30
20
10
0
1 2 3 4 5 6 7 8
Detrusor Instability
1 2 3 4 5 6 7 8
Sensory Urgency
1 2 3 4 5 6 7 8
Genuine Stress Incontinence
(No help = 1, very helpful = 8.)

Figure 7.6

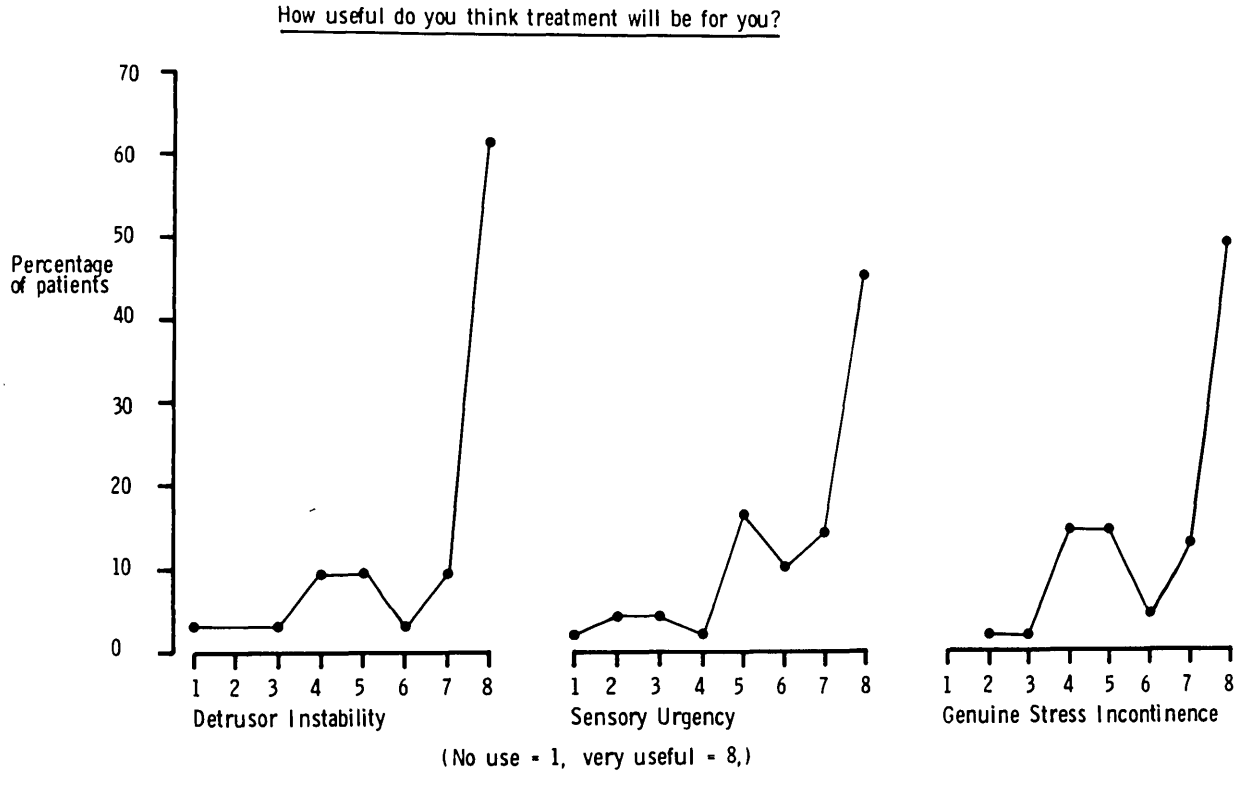
How useful do you think treatment will be for you?
Percentage of patients
70
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8
Detrusor Instability
1 2 3 4 5 6 7 8
Sensory Urgency
1 2 3 4 5 6 7 8
Genuine Stress Incontinence
(No use = 1, very useful = 8,)

Figure 7.7

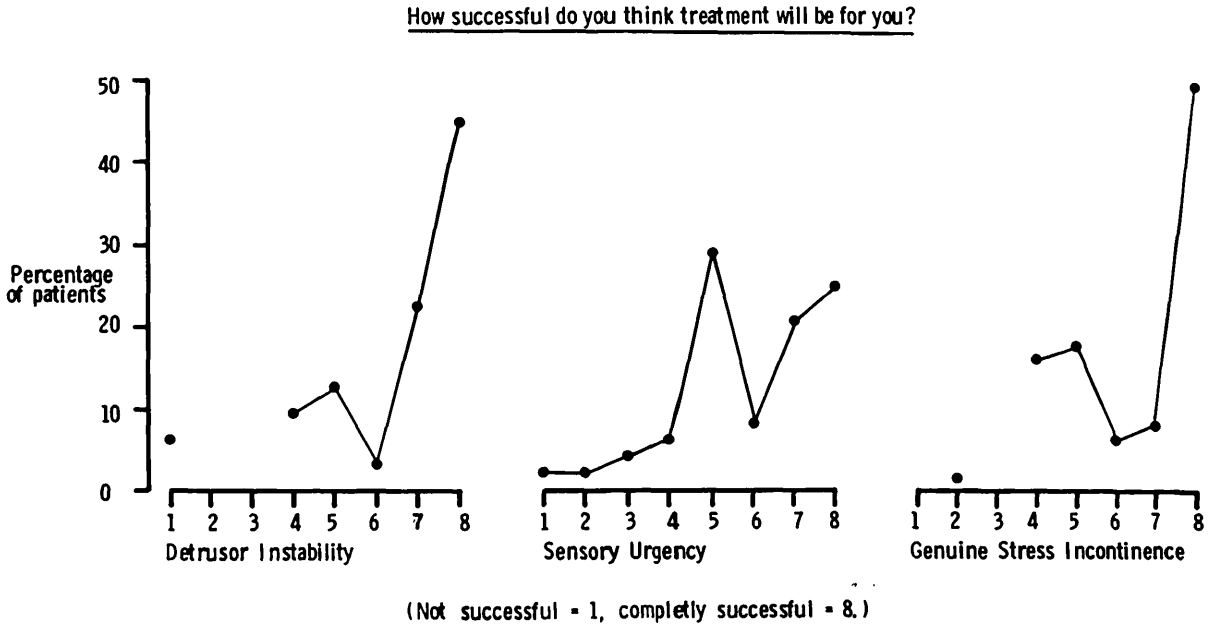

Figure 7.8

The scores on these three measures were added together to form a combined "expectation of treatment" score, and figure 7.9 shows the results. In this and subsequent figures, the data are presented as mean and standard error of mean. The scores show that these patients were quite

optimistic about the effects of any treatment offered; there was no significant difference between the three diagnostic groups.

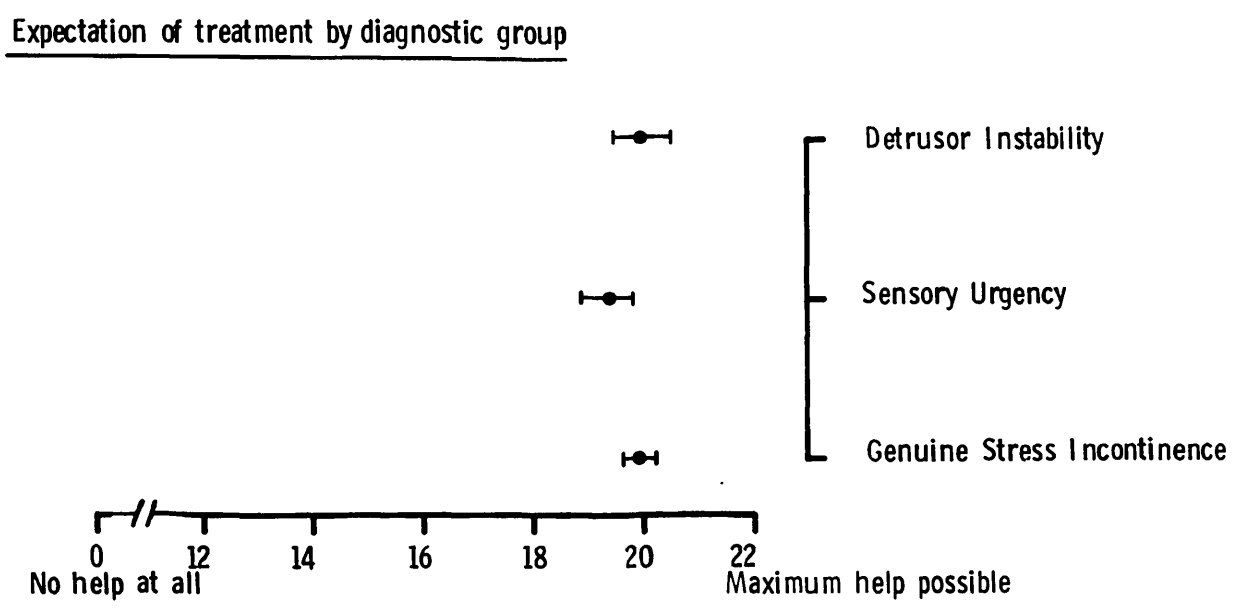

Figure 7.9

When the "successful" scale is analysed separately, patients with sensory urgency thought that the treatment would be less successful for them than did patients with either DI or GSI ($p<0.05$).

Measures of Anxiety

Three measures of anxiety were made. These were:

1) Spielberger State Anxiety,
2) Spielberger Trait Anxiety,
3) Anxiety Sub-scale on Crown-Crisp Experiential Index.

The results of the Spielberger State Anxiety are presented in figure 7.10. This scale measured anxiety at the time of filling in the questionnaire. The questions included the phrase "right now" whilst the trait scale prefaced the questions with the word "generally".

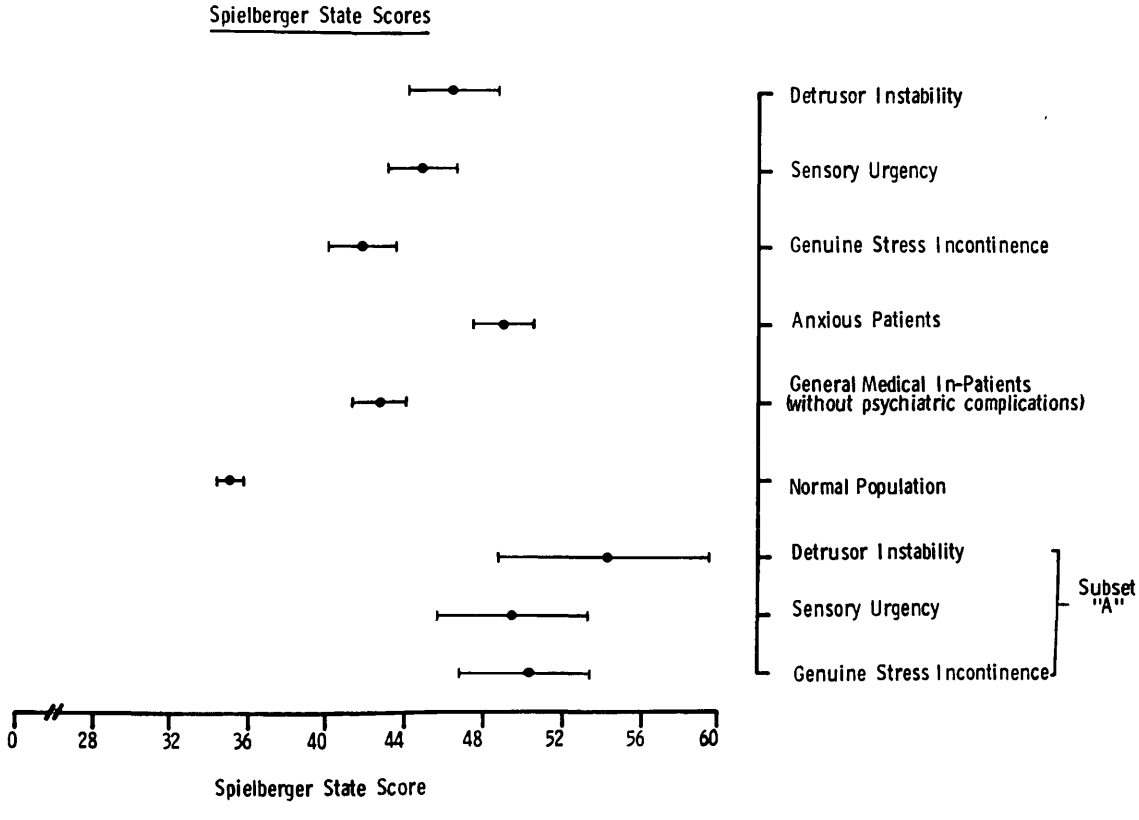

Figure 7.10

The results of the trait scale scores are presented on figure 7.11. The results of the anxiety sub-scale score of the CCEI are presented in figure 7.12.

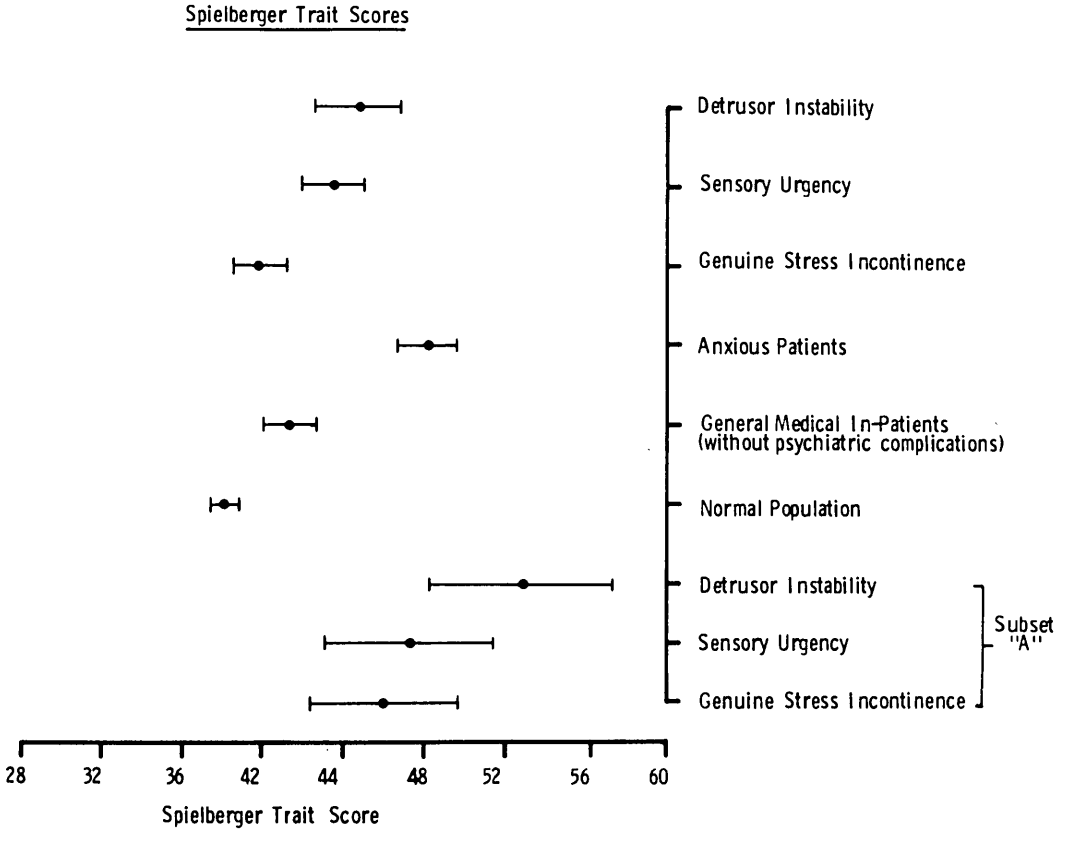

Figure 7.11

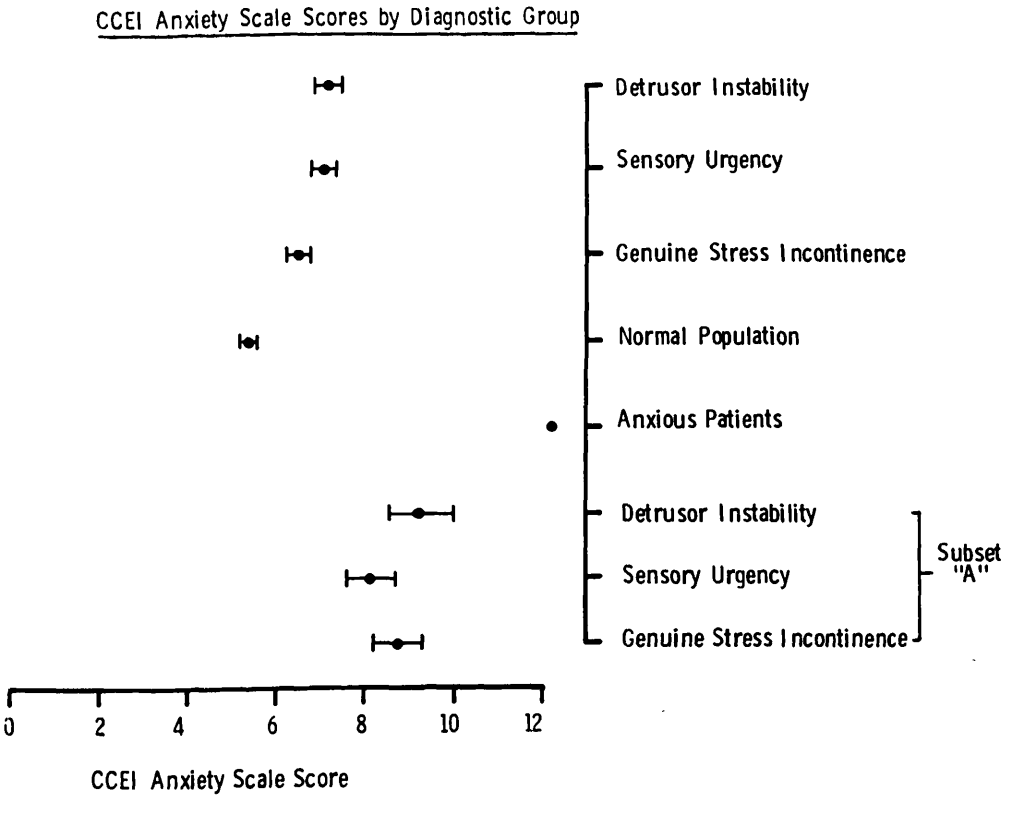

Figure 7.12

On all scales the patients were more anxious than a normal population of equivalent age. Patients with GSI were no more anxious than general medical in-patients who do not have medical complications, whilst patients with DI or SU were significantly ($p<0.05$) more anxious. However none of the groups were as anxious as those with a formal diagnosis of anxiety neurosis. There was a tendency for

DI scores to be higher than SU scores which were higher than GSI scores. Subset A scores were significantly higher ($p<0.05$) and matched those of psychiatric in-patients (on the Spielberger scales), whatever the diagnostic category.

Depression

This symptom was measured using two scales, the Wakefield Depression Scale and the depression subscale of the CCEI. (Figures 7.13 and 7.14).

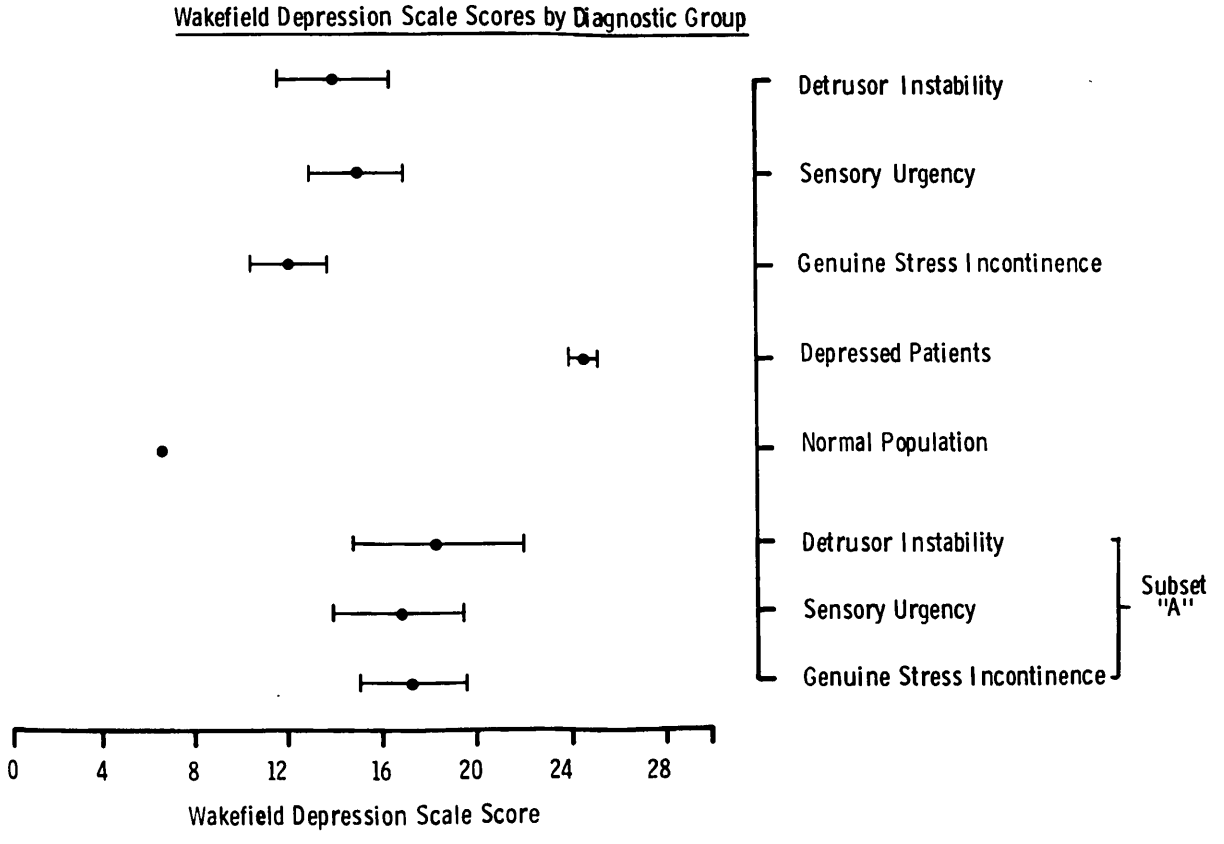

Figure 7.13

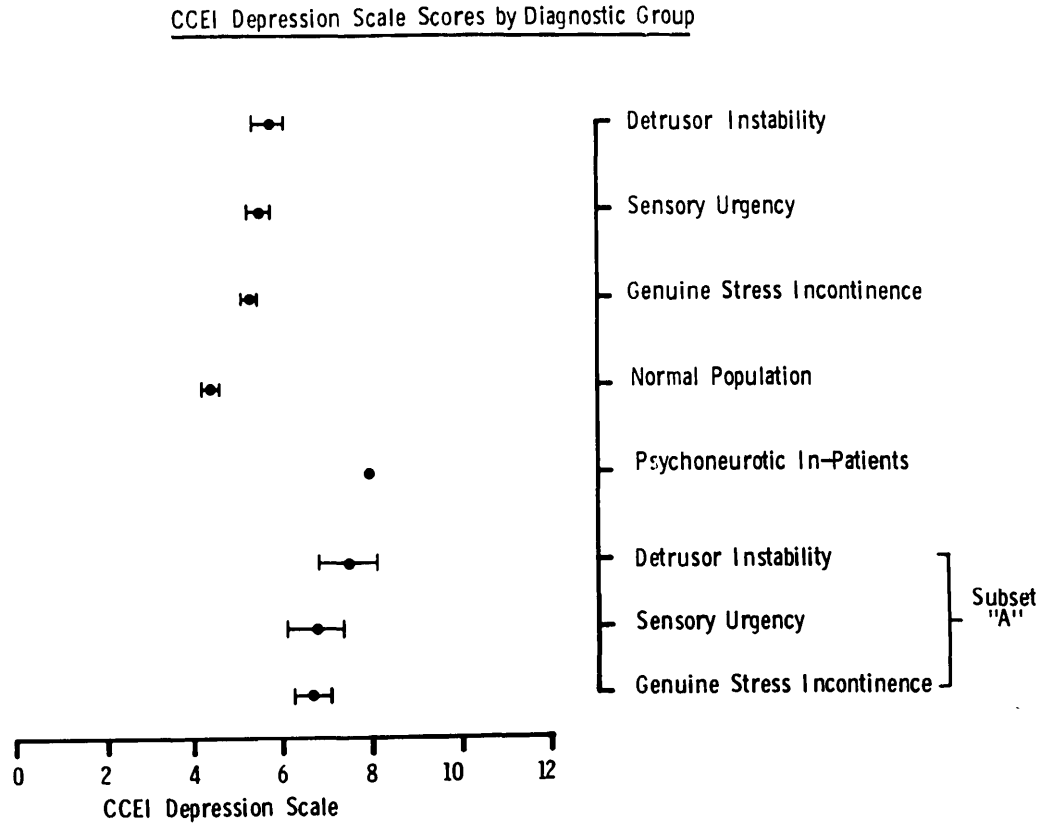

Figure 7.14

The results are similar. Urodynamic patients were more depressed than the normal population but not as much as psychiatric in-patients with depression. Those in subset A were more depressed than urodynamic patients as a whole. The severity of symptoms reported was of the same magnitude as depressed in-patients (on the CCEI subscale). There was no significant difference between the diagnostic categories on the depression scales. On the CCEI,

however, there was a tendency for DI scores to be greater than GSI scores.

Crown-Crisp Experiential Index

Two of the scales have already been discussed. The remaining four are: phobic anxiety, obsessionality, functional somatic complaint and hysteria scales.

Phobic Anxiety

The questions enquired about fear of enclosed spaces, heights or crowds and worrying about incurable illness, travel, going out and relatives coming home late. The results are presented in figure 7.15.

There was no difference between the three groups but all had higher scores than a normal population. Though significant ($p<0.05$), the difference between the means of the normal and urodynamic patients was only one point on the scale. Subset A scores were significantly raised and differed from one another, depending on diagnosis: the mean score of the patients with DI was higher than that in the SU group, which in turn was higher than that of the group with GSI.

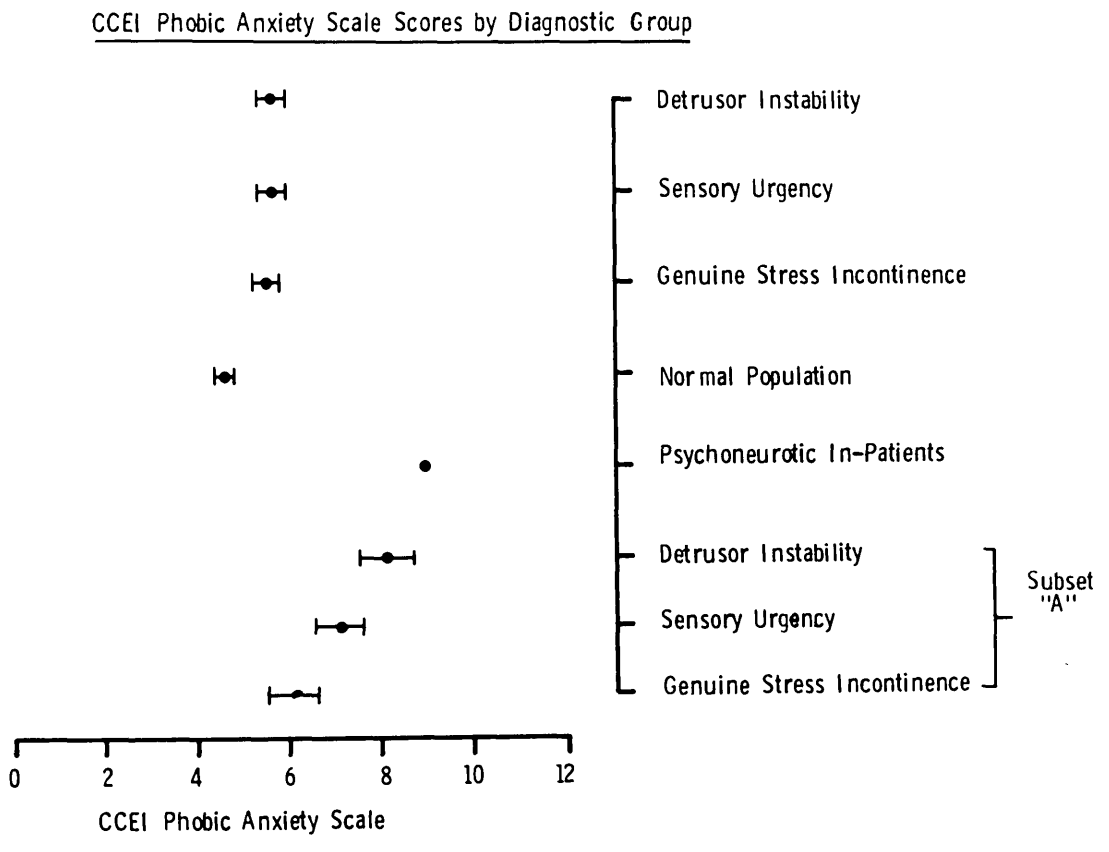
CCEI Phobic Anxiety Scale Scores by Diagnostic Group
Detrusor Instability
Sensory Urgency
Genuine Stress Incontinence
Normal Population
Psychoneurotic In-Patients
Detrusor Instability
Sensory Urgency
Genuine Stress Incontinence
Subset "A"
0
2
4
6
8
10
12
CCEI Phobic Anxiety Scale

Figure 7.15

Obsessionality Scale Score

This scale measured two aspects: obsessional personality traits and obsessional neuroses. The results are presented in figure 7.16.

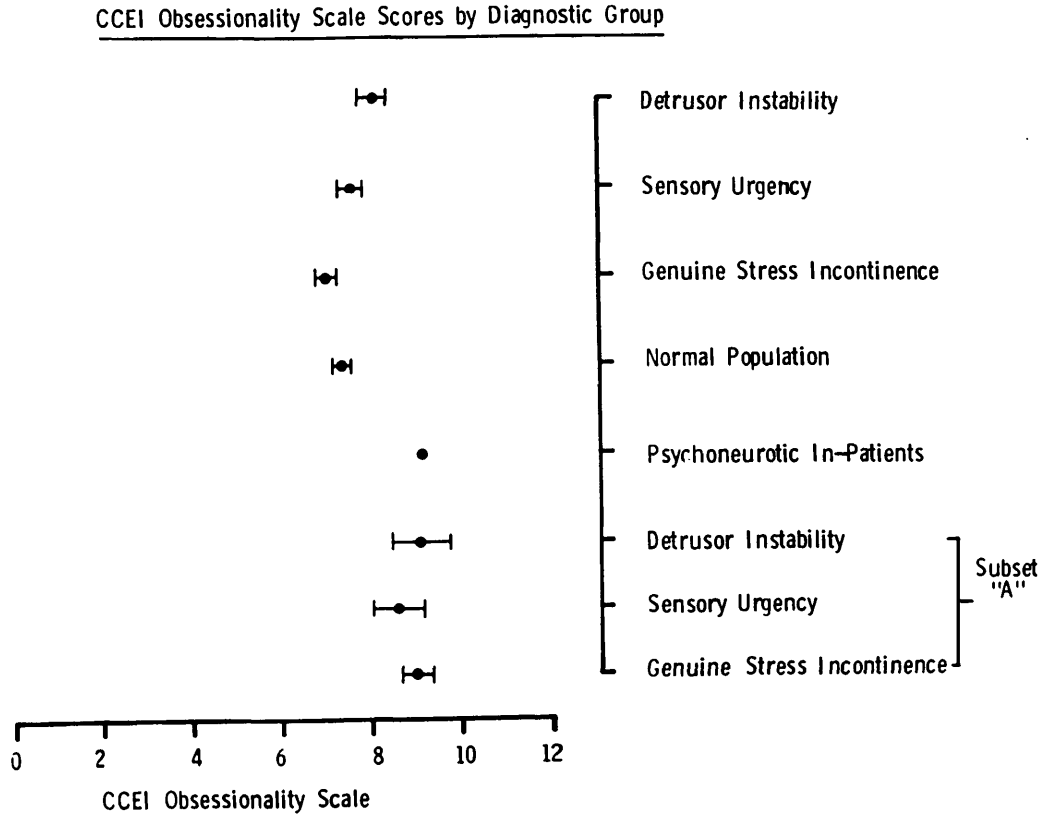

Figure 7.16

The differences between the group means were modest. Subset A scores were as high as those of in-patients with psychoneurotic illness.

Functional Somatic Complaint Scale Score

This scale contained questions about dizziness, shortness of breath, sickness or indigestion, tingling or prickling sensations, appetite, tiredness, sleeping, sweating, palpitations and libido. The results are presented in figure 7.17.

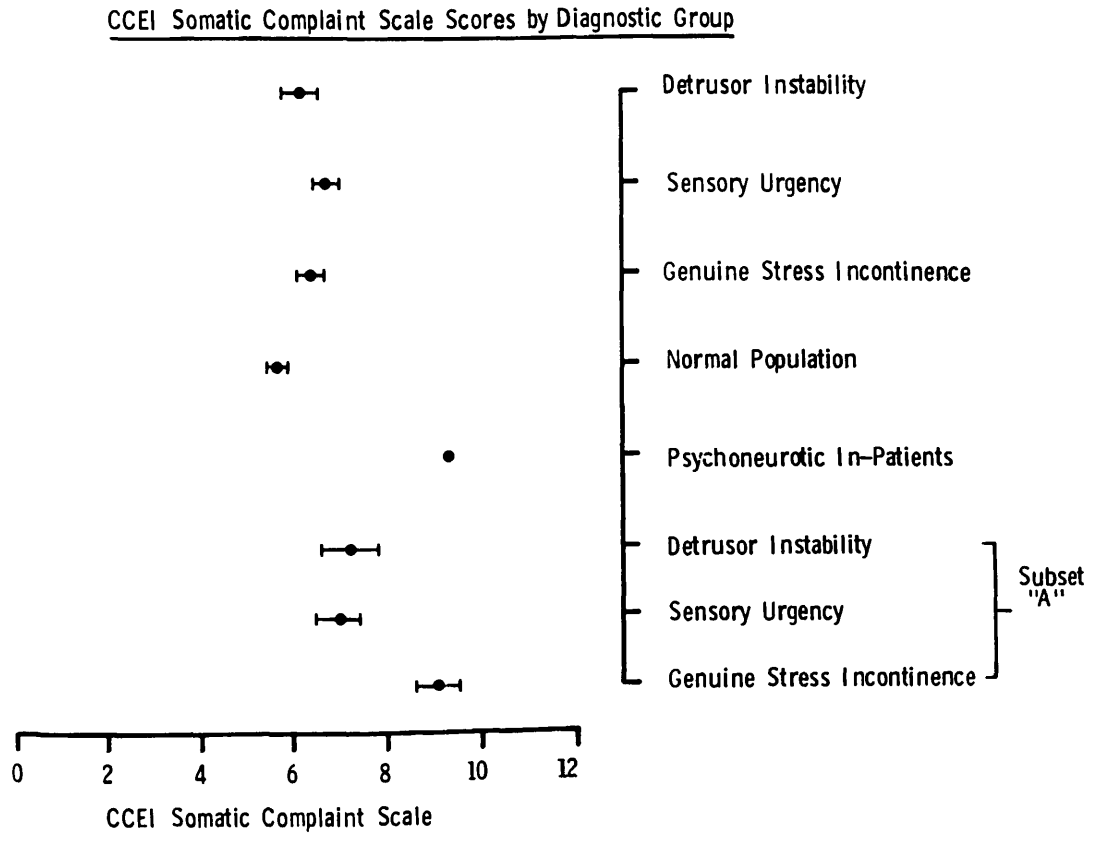

Figure 7.17

The scores of all three groups were raised when compared to a normal population. However, there was little difference between the groups, one point on the scale covering urodynamic patients and normal population. None of the means approached that of psychoneurotic in-patients.

In subset A the GSI group score was significantly higher than that of the other two groups, that is they had more somatic complaints. This difference was accounted for by three questions; they were more breathless and had trouble breathing ($p<0.001$), they were more tired and exhausted ($p<0.05$) and their sexual interest was less ($p<0.05$). This finding is in contrast to the trends for the other measures in which the GSI scores were the lowest.

Hysteria Scale Score

The results are presented in figure 7.18. All urodynamic patients scored higher than a normal population. The mean score for the DI group was significantly higher than the means in the other two diagnostic groups. The scores of subset A, though high, were not as high as the value for psychoneurotic in-patients.

There was a negative correlation between the hysteria scale score and age. Though, highly significant ($p<0.001$) it only accounted for 4% of the variance.

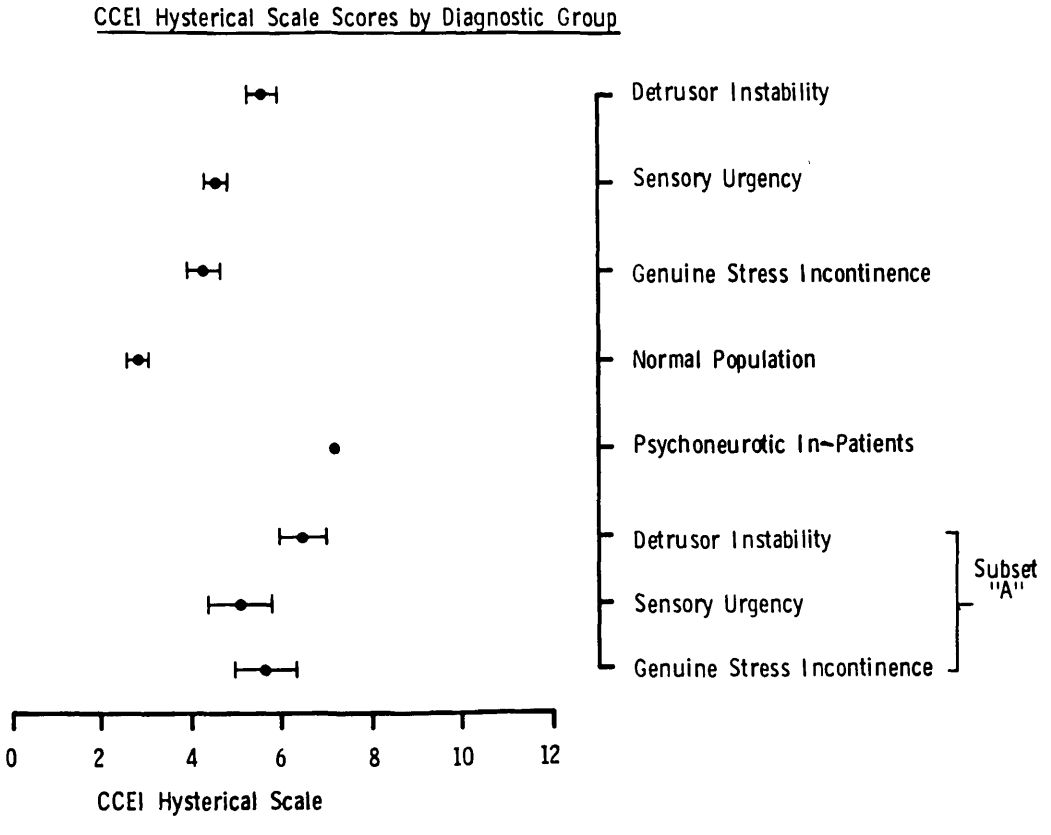

Figure 7.18

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CHAPTER EIGHT

DISCUSSION OF CLINIC SURVEY

Hypotheses

Page 8 listed a number of hypotheses relevant to the clinic survey and these are now discussed in the light of the findings as presented in the preceding chapter.

The clinic survey of patients attending the Urodynamic Unit, Department of Obstetrics and Gynaecology, St George's Hospital Medical School, would show psychological disturbances in accordance with previous surveys.

The results described are in line with those reported by Cardozo (1980) and suggests that the pattern of referrals has not significantly altered since then. The results are also broadly similar to those reported by Freeman, McPherson and Baxby (1985) with the exception noted already of the patients with DI who did not differ significantly on the hysteria scale scores from patients with SU. It is possible that the smaller numbers in their survey failed to stand out as a significant group. Alternatively, their population of patients with DI were truly different in this respect. Leaving aside this difference, the consistent finding of increased anxiety associated with micturition disorders confirms the importance of investigating the relationship further with respect to causality and the possible potential for novel therapeutic interventions.

Patients with GSI would show psychological disturbances commensurate with those associated with a physical disorder.

This hypothesis was confirmed. Physical disorders can cause anxiety and worry, even if the condition is not life-threatening. Patients with GSI appear to be typical in that they score higher than the normal population for anxiety and depression. Thus, comparisons with such a group, rather than the normal population are more useful in elucidating the role of psychological factors in the genesis of urinary sypmtoms.

Patients with DI or SU would show more psychological disorders than patients with GSI.

This hypothesis was confirmed. This finding is in accordance with other workers (for example Cardozo, 1979 and Frewen, 1978). However, this survey has also shown that there is a difference between patients with DI and patients with SU. This raises an important question about contribution of psychological factors to the aetiology of both these conditons. Although the social consequences of the three disorders (GSI, DI, SU) are possibly similar, the psychological profiles are very different. This is discussed later in the chapter.

Patients who reported greatest distress would score higher on the standardised rating scales than patients who reported little distress.

This hypothesis was confirmed, which taken with the normal finding on the functional somatic complaint scale of the CCEI adds weight to the patients' statement of distress and its perceived cause.

In relationship to other hypotheses, an important finding was the psychological profile of patients who said that their symptoms "made life not worth living". Their psychological scores were at least as high as psychiatric in-patients. Neither the finding itself, nor its magnitude (25% of all patients in the survey felt that their symptoms made life not worth living) were predicted. This merits further study, and is an important finding of the clinic survey.

There would be consistency of results across the standardised questionnaires.

This hypothesis was confirmed. The chapter on choice of psychological measures outlined the rationale for using the Spielberger state/trait anxiety inventory, Wakefield depression scale and Crown-Crisp experiential index. Notwithstanding the limitations of the measures used, the cross questionnaire consistency of the results strengthens

the reliability and validity of the measures used and adds weight to the findings.

Discussion

The previous chapter presents the results of the psychological assessment of 150 patients attending a urodynamic clinic. Thirty-one percent had GSI, 25% had SU and 15% had DI. Previous surveys have shown a similar distribution of diagnoses (Cardozo, 1980). Patients with GSI were significantly older than those in other categories.

There was no difference in duration of symptoms between the three main diagnostic groups, the majority (64%) having had their symptoms for over two years. Although not life-threatening these complaints are a source of significant morbidity. Long standing symptoms may become incorporated into the patient's lifestyle and personality. It is to be expected that this change will be reflected in the psychoneurotic profile as measured by the CCEI, which was, in fact, the case.

Despite prolonged symptoms, the patients as a group appeared quite optimistic when asked about expectation of treatment. It is impossible to assess individual interpretation of the three adjectives "helpful", "useful" and "successful". However, "successful" might suggest a

cure - whereas "helpful" or "useful" are more ambiguous on this point. Scores on the "successful" scale differed significantly by diagnostic group. Patients with SU thought that therapy would be less successful for them, yet patients with the same symptoms (the DI group) were as optimistic as the GSI group. In the main, the urodynamic unit acts as a tertiary referral centre. After several consultations, first with the GP and then at hospital outpatients, women with GSI may have been led to expect that treatment was likely to help. However, a patient with similar symptoms but no clear anatomical cause may have been given a different message, particularly if she seemed at all anxious. Patients with DI present with similar symptoms to those with SU. DI patients may however have aroused a different response from the physician as a result of their abnormal mental state (as reflected by the elevated scores on all psychological measures). In addition, Hafner and Stanton (1977) suggested that some patients with DI were able to deny or disclaim neurotic symptomatology; such a mechanism may also be at work in patients when they are asked about their expectation of treatment.

Any patient is likely to be more anxious than normal. This survey showed that GSI patients had anxiety scores that were equivalent to those of general medical in-patients without psychiatric complications. Patients with

DI or SU were significantly more anxious, suggesting that the symptom of anxiety is an important correlate of the symptoms of urgency, frequency, nocturia and urge incontinence. There was also a tendency for DI patients to be more anxious than SU patients.

A trend similar to the anxiety scores is apparent in the depression scores. Thus, urodynamic patients were more depressed than normal, and those with DI scored rather more highly than those with GSI. "Depression" can refer to a mood, a symptom or an illness. Urodynamic patients do not have a depressive illness but they do have a depressed mood as might be expected in any patient with a longstanding distressing condition.

In general, on most measures, the GSI group means were nearest to the normal population scores. Mean values for SU patients fell between those of the DI and GSI groups. DI patients were characterised by moderately high CCEI scores with the exception of the functional somatic scale score. They stand out as a separate group, notably on the hysteria scale score and this finding is in contrast to that of Freeman, McPherson and Baxby (1985). This scale assesses aspects of personality relating to self esteem and self confidence. This might imply a causal relationship: patients with similar symptoms but normal

cystometry (the SU group) do not differ from patients with GSI.

The results on the functional somatic scale suggest that urodynamic patients do not present with multiple complaints. Even patients in subset A do not complain as much as psychoneurotic in-patients. This lends credence to the significance of their existing symptoms. The GSI group of subset A have more somatic complaints (in particular, more dyspnoea, tiredness and less interest in sex). This finding suggests that this subset may have personality difficulties which are exacerbated by chronic urinary symptoms.

Thus, the psychological profiles of the three main diagnostic groups were very different. These differences cannot be explained on the basis of age or duration of symptoms.

The pattern of results in urodynamic patients contrasts with the findings of Rees and Farhoumand (1977) in women with recurrent cystitis. Fifty patients were given detailed psychological assessments including the CCEI. The authors found that these patients were anxious and obsessional. They also had significantly raised scores on the functional somatic complaint scale but they were not depressed or socially phobic. Recurrent cystitis is another chronic urinary complaint, whose symptoms

include pain on micturition. It may be that this added symptom accounts for the different results and suggests that other psychological mechanisms are important.

For a significant proportion of patients in this study, (25% of those with DI and SU) life is not worth living because of their urinary symptoms. This group were as anxious, depressed and phobic as psychiatric in-patients. It is possible that an abnormal psychological state may itself be able to generate urinary symptoms. Conversely, chronic urinary problems are a genuine source of stress. That the latter is so is suggested by the finding that a similar proportion of GSI patients also claimed that life is not worth living. No definite conclusions about causality of the psychopathology or urinary symptoms can be drawn from this study. However, if a patient finds life intolerable because of apparently minor physical symptoms, the emotional side of her life might gainfully be reviewed. This may help her cope with the symptoms, just as symptom relief may help her cope with emotional stress.

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CHAPTER NINE

METHOD OF TREATMENT TRIAL

Introduction

Chapter Two referred to the effectiveness of psychological treatments for urgency and frequency of micturition. For example, the study of bladder training by Pengelly and Booth (1980) reported a cure rate on cystometry of approximately 44% and a symptomatic improvement of 76% for patients with DI. Frewen's (1978) treatment was a complete package of in-patient treatment for ten days, the keeping of a bladder diary, bladder training, anxiolytic and anticholinergic medication and supportive therapy. His results were impressive, but it is difficult to know which were the most important aspects.

The behavioural symptom-orientated approach of bladder training appears to be effective. However, it is less clear whether other aspects such as supportive therapy are also necessary or indeed whether they are perhaps therapeutic in their own right. Medication has been shown to help some patients though Turner-Warwick and Whiteside (1979) state that any improvement is modest and unpredictable. Another disadvantage becomes apparent when the medication is stopped - the symptoms return (Cardozo 1979). This present study was designed to elucidate some of the factors that might be clinically relevant, therapeutic and possible.

The potential therapeutic factors were divided into three; modified brief psychotherapy, bladder training and medication.

Psychotherapy

Patients allocated to this group were all seen by a psychiatrist (A J M). It was suggested to the patients that their symptoms were a manifestation of anxiety and that treatment aimed at relieving the anxiety would help the urinary symptoms. Following this explanation no direct enquiry was made about the symptoms. Patients were seen weekly, for eight to twelve sessions of fifty minutes. This treatment was designed to offer the non-symptom orientated measures of support, counselling and anxiety-reducing aspects of the package as described by Frewen, minus the specific bladder training. Patients were also taught relaxation using biofeedback based on skin resistance. At session two or three each patient was given their own portable machine and instructed in its use. They were then told to practise daily for ten to fifteen minutes.

Bladder Training

This treatment was given in all cases by the unit nurse who was employed in a research capacity. In addition to the bladder training treatment, she also carried out routine cystometries and generally assisted in

the day to day work of the unit. She did not have any psychiatric nursing experience and was taught the principles of bladder training by the other team members who were experienced in the technique. Points of detail about the treatment were discussed at regular team meetings.

The patients were seen fortnightly for three months and again after one month (seven sessions). Although no formal advice was given at the visit for post-treatment cystometry, the patients were aware that they would be seeing the same nurse on that occasion.

The treatment involved the patient keeping a bladder diary and then learning to urinate at pre-determined intervals. Initially, this was the shortest time between urinations, as recorded in the diary. The time between was gradually increased throughout the treatment period. The patient was instructed to ignore bladder cues and to urinate at the set times regardless. Pelvic floor exercises were also taught to enable the patient to control, as far as possible, any symptoms of urgency.

This study was designed to assess the relative efficacy of different aspects of treatment; bladder training was restricted to instruction of the technique. Patients were discouraged from any discussion about

worries they might have had, the difficulties caused by the symptoms or emotional factors in general.

Medication

In routine clinical practice patients with urgency and frequency often receive anticholinergic medication. Hence, as an ethically acceptable control treatment patients were given propantheline 15mgs three times a day. This was supervised in outpatients by the registrar in gynaecology attached to the urodynamic unit. He kept his enquiry to discussion of medication and did not suggest any other treatment (such as bladder training) or offer any counselling.

Method

Following cystometric diagnosis the patients were told about the trial and invited to take part. They were not aware of which treatment they would receive. They were then allocated sequentially in groups of five to one of the three treatment groups.

There were a number of exclusion criteria:

1) Age less than twenty years or more than sixty five years.

2) Previous serious psychiatric illness.

3) Other serious medical or renal illness that might affect bladder function.

4) Patients unable to attend the unit regularly for any reason.

Measurements

Four parameters were measured during this study:

1) Mental state, as measured by standardised questionnaires.

2) Subjective assessment of the symptoms by the patient.

3) Patients' symptoms, as measured by bladder diary.

4) Objective measurement of bladder function, as measured by cystometry.

Mental State

Three questionnaires were used: Spielberger State/Trait Anxiety Inventory, Wakefield Depression Scale and Crown-Crisp Experiential Index.

Note The CCEI scales of Obsessionality and Hysteria are said to measure enduring aspects of personality (Crisp A H, 1977). It was not envisaged that these would change with treatments such as propantheline, bladder training or twelve sessions of psychotherapy. Also, the questions in the hysteria subscale in particular were not designed to measure change over a time period. For example, one question was worded "Have you at any time in your life enjoyed acting?". Once a patient has answered "yes" they cannot subsequently answer "no". However, overall the questionnaire is useful in that it provides a psychoneurotic profile.

The questionnaires are discussed in greater detail in chapter five.

Subjective Assessment

Patients were asked to fill in self-rating scales enquiring about their expectation of treatment and a subjective assessment of their symptoms (listed in appendix A).

The questionnaires were administered at first attendance at the clinic, prior to assessment by the urodynamic team (interview one). The questionnaires were next administered prior to cystometry (interview two). The time interval between the first two questionnaires was not less than four weeks and not more than ten weeks (figure 9.1).

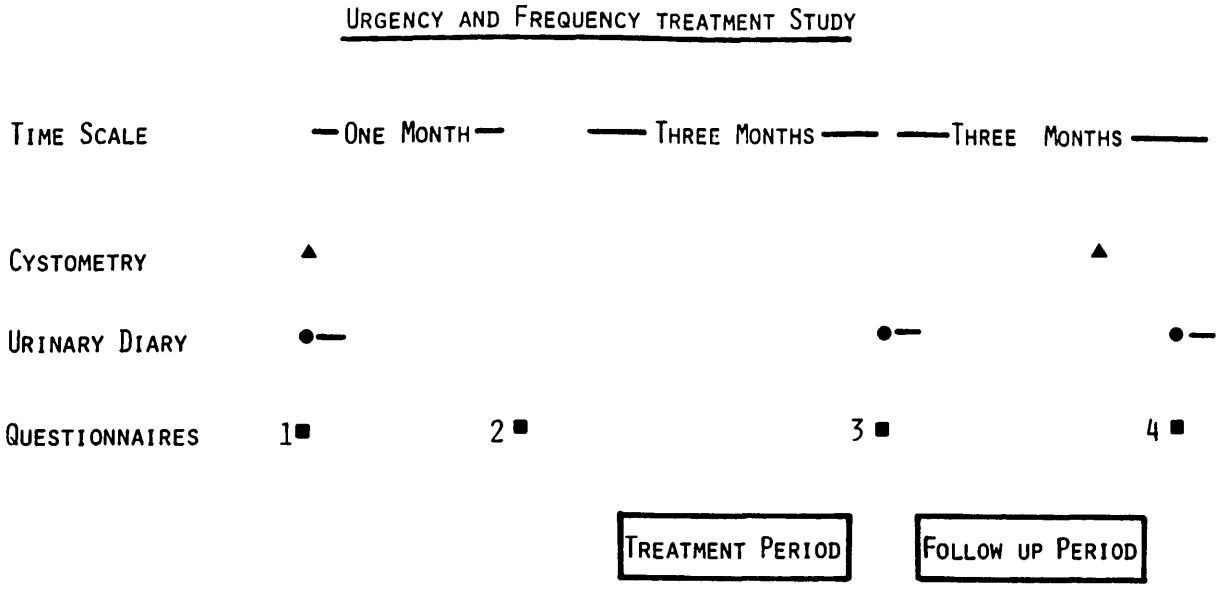

Figure 9.1

A small number of patients were seen directly in the laboratory, in which case in the propantheline group there was only one opportunity for pre-treatment measure of mental state and expectation of treatment. In the bladder training and psychotherapy groups interview two was

deferred until just before treatment, a gap of approximately four weeks.

The questionnaires were also administered on finishing treatment (interview three) and again on follow-up when the patients attended for cystometry (interview four). The time interval between post-treatment and follow-up interviews was not less than twelve weeks and not more than twenty weeks.

Bladder Diary

Patients were asked to keep a diary for one week (appendix B) at the following times:

1) Prior to treatment.

2) Immediately on finishing treatment.

3) At follow-up.

They were given some flexibility in the amount of detail they provided. For example. if they were out shopping it was unrealistic to expect a measure of urinary output.

In addition to calculating frequency and nocturia the symptom of urgency (figure 9.2) was measured and rated.

Score	Detail of Urgency
3)	Occurring on every occasion or more prior to micturition.
2)	Less than on every occasion but on more than two occasions during the day.
1)	Urgency less than twice a day.
0)	No complaint of urgency.

Figure 9.2

The symptom of incontinence was rated for amount lost and number of times per week the maximum loss occurred. This combination was assigned a single digit number as listed in figure 9.3.

Amount Lost	Number of times per week		
	0 - 7	8 - 14	14 plus
Few drops only	1	4	7
Soaked Pants	2	5	8
Emptied Bladder	3	6	9

Figure 9.3 Incontinence Rating

Cystometry

In all cases this was carried out prior to treatment. Entry to the trial depended on cystometric findings of

either sensory urgency or detrusor instability. Post-treatment cystometry was arranged during the follow-up period. The method of cystometry is described in Chapter One. The results were coded to give the following information: maximum bladder capacity, first sensation of bladder fullness and pressure rise on filling.

Statistical Tests

The data obtained from this trial were analysed in two ways. First, variables were tested to see if there were any between group differences at pre-treatment, post-treatment and follow-up assessment. For continuous variables, having reasonably normal distributions, analysis of variance was used, while for categorical variables, chi-squared tests were used to find significant associations.

Secondly, the trial variables were examined within groups to ascertain if there were differences between pre-, post- and follow-up periods. For this purpose paired *t*-tests were used. The results of the analysis are presented in chapter 10.

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CHAPTER TEN

RESULTS OF TREATMENT TRIAL

Number of Patients and Diagnosis

After cystometry 52 patients were invited to take part in the trial. Two patients declined and one patient from each group dropped out before undertaking any treatment. Thus, 47 patients were evaluable (figure 10.1).

Diagnosis	DI	SU	Total	Total Evaluable
Psychotherapy group	10	9	19	18
Bladder Training group	8	8	16	15
Propantheline group	8	7	15	14
			50	47

Figure 10.1 Diagnosis by group

In spite of every effort some patients did not complete all the ratings at the appropriate times. Figure 10.2 shows numbers of patients assessable at each stage of the trial. The psychological questionnaires were all completed under supervision and consequently the data are complete for this section of the results. Patients had agreed at the start of the trial to undergo post-treatment cystometry. In the event only 60% could be persuaded to do so. Some patients failed to complete bladder diaries; possible reasons for the gaps in data are discussed in chapter eleven.

The reasons for using a galvanic skin resistance biofeedback for relaxation were discussed in the methodology. In fact, none of the patients used the machine as instructed. Therefore no data is presented on this aspect of the trial. Possible explanations for this are developed in chapter eleven.

Measure	Pre-treatment	Post-treatment	Follow-up
Cystometry:			
Psychotherapy Group	18	9	not applicable
Bladder Training Group	15	8	not applicable
Propantheline Group	14	6	not applicable
Bladder Diaries:			
Psychotherapy Group	17	14	9
Bladder Training Group	13	10	7
Propantheline Group	13	12	9
Psychological Ratings:			
Psychotherapy Group	18	18	18
Bladder Training Group	15	15	15
Propantheline Group	14	14	14

Figure 10.2 Number of Assessable Patients

Cystometry

Objective bladder function was measured by cystometry before and after treatment.

Pressure Rise

Pressure rise on filling (figure 10.3) refers to the increase in pressure as the bladder is filled with physiological saline.

In the psychotherapy group the pre-treatment mean pressure rise for the whole group was 15.6 cms of water. In the 9 fully-evaluable patients the pre-treatment mean was 17.5 cms and the post-treatment mean 18.8 cms. This difference was not significant ($p=0.86$).

In the bladder training group the mean pre-treatment pressure rise was 28.9 cms of water for the whole group. Eight patients had both pre- and post-treatment measures: their mean pressure rise pre-treatment was 45.5 cms of water and post-treatment 29.5 cms, ($p<0.05$), a significant reduction.

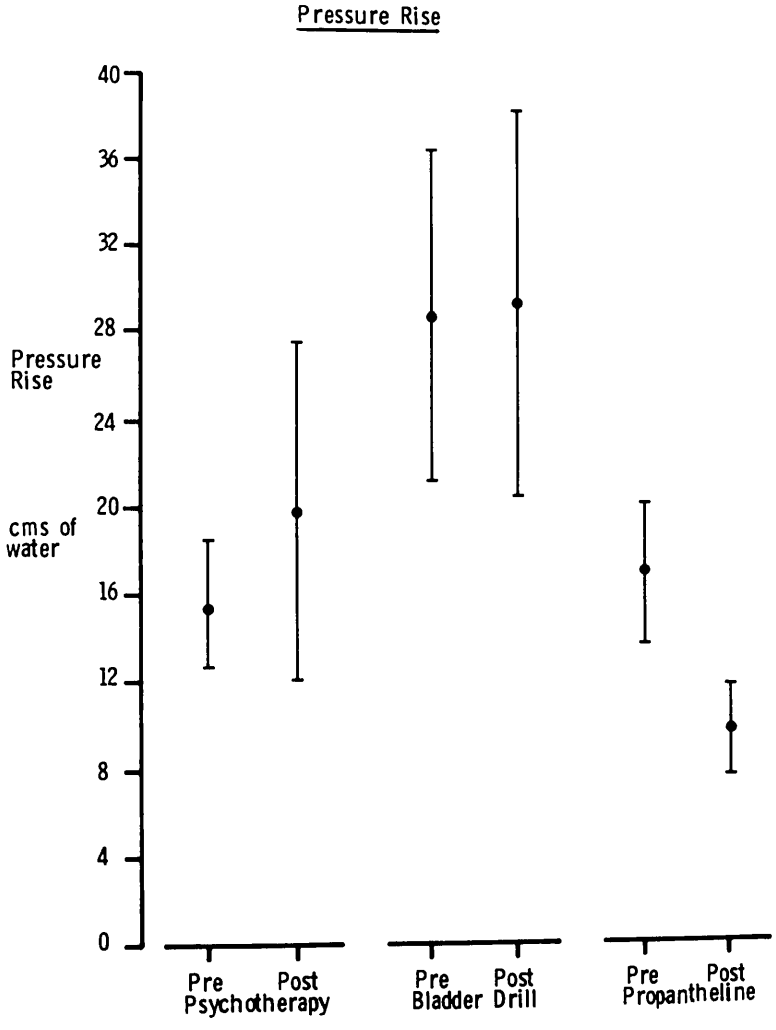
Pressure Rise
40
36
32
28
Pressure
Rise
24
20
cms of
water
16
12
8
4
0
Pre
Psychotherapy
Post
Pre
Bladder
Post
Drill
Pre
Propantheline
Post

Figure 10.3

In the propantheline group the mean pre-treatment pressure rise was 17.3 cms of water for the whole group and 12.0 cms for the subset who had post-treatment cystometry. The post-treatment mean pressure rise was not significantly different (p=0.48) at 9.8 cms of water.

First Sensation

During the filling phase of cystometry patients were asked to push an event marker at the first sensation of bladder fullness. This is technically known as "first sensation" (figure 10.4).

The pre-treatment mean first sensation for the psychotherapy group was 100 mls. In the nine patients with pre- and post-treatment cystometry results, the pre-treatment mean was 107 mls and after treatment this rose to 142 mls. Although this improvement in means was impressive, the range of individual values was wide, and the paired *t*-test failed to show a significant difference (p=0.55).

Before treatment the mean first sensation in the bladder training group was 144 mls. In the eight patients who had cystometry post-treatment, the first sensation before treatment was 110 mls pre-treatment, increasing to 150 mls post-treatment. This improvement of 40 mls was significant (paired *t*-test $p<0.05$).

For the propantheline group the pre-treatment mean was 79 mls. The pre-treatment mean for the six patients who had post-treatment cystometry was 70 mls and post-treatment 137 mls. This improvement just failed to achieve statistical significance (p=0.06).

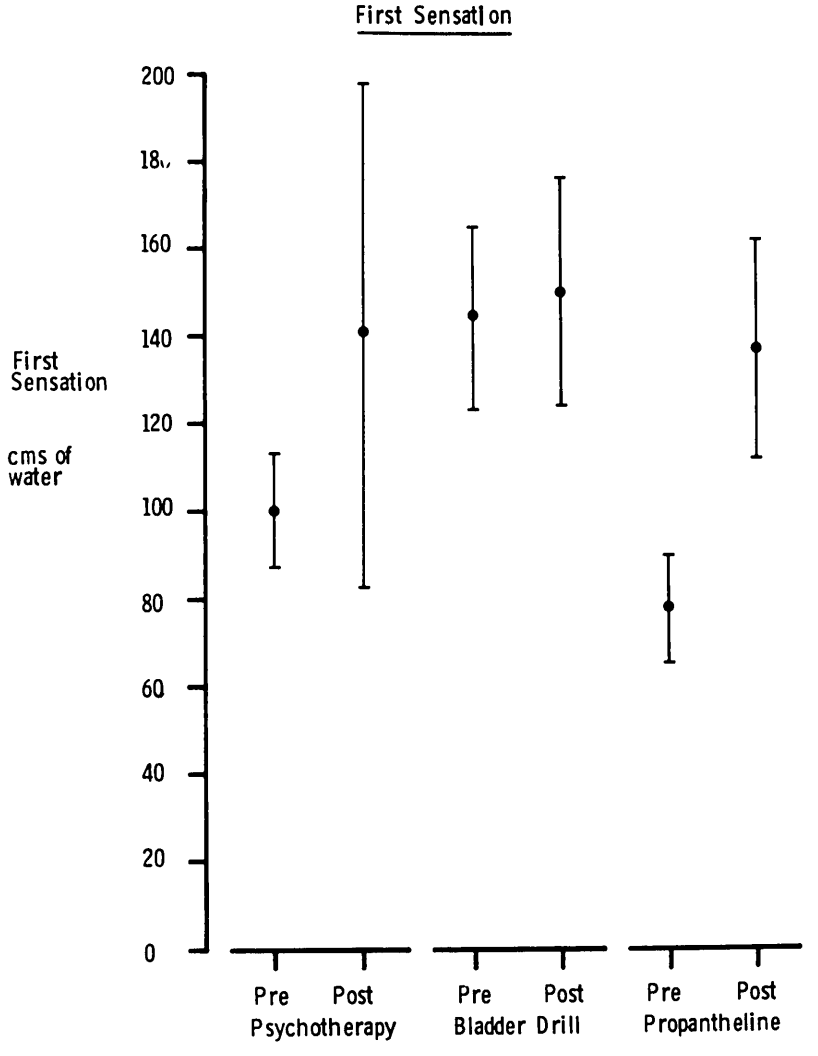

Figure 10.4

Thus, although all three groups had a tendency to improve, only in the bladder training group was this significant. However, the magnitude of the change in the psychotherapy group was similar (42 mls) and more (58 mls) in the propantheline group.

Bladder Capacity

The pre-treatment mean bladder capacity for the bladder training group was 398 mls (figure 10.5). For the eight patients with post-treatment cystometry the mean pre-treatment capacity was 341 mls and post-treatment 314 mls (not significant p=0.49).

The pre-treatment mean bladder capacity for the psychotherapy group was 364 mls. For the nine patients who underwent repeat cystometry the mean pre-treatment bladder capacity was 393 mls and post-treatment 414 mls (not significant p=0.54).

The pre-treatment bladder capacity for the propantheline group was 339 mls. For the six fully assessable patients the mean pre-treatment bladder capacity was 323 mls and post-treatment 368 mls (not significant p=0.24).

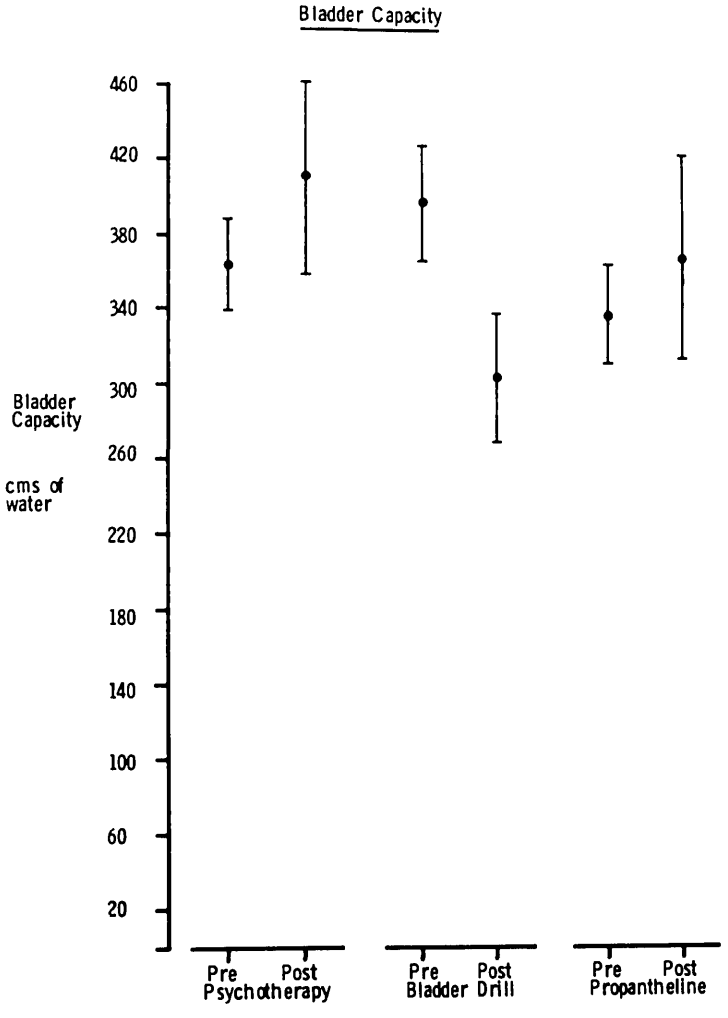
Bladder Capacity
460
420
380
340
300
260
220
180
140
100
60
20
Bladder Capacity
cms of water
Pre
Post
Psychotherapy
Pre
Post
Bladder Drill
Pre
Post
Propantheline

Figure 10.5

Summary of Cystometry

In the propantheline and psychotherapy groups, those who agreed to post-treatment cystometry were representative of the groups as a whole. Whilst there were no significant changes there was a trend towards improvement for both these groups in bladder capacity and first sensation.

The bladder training group started off with more detrusor abnormality, as measured by pressure rise on filling. The eight patients in this group who agreed to post-treatment cystometry were the patients with most detrusor abnormality. The mean pressure rise for these eight patients decreased by 16 cms. It is interesting that the subjective first sensation was noted significantly later, despite an objective decrease in mean bladder capacity.

The bladder training group was the only group to show significant results for the "first sensation" measure. "Bladder capacity" showed significant differences between the three groups.

Bladder Diaries

The diaries represent an attempt to measure objectively the subjective complaints of frequency, urgency, nocturia and incontinence. All three groups started with a similar range and severity of symptoms.

There were no significant differences between the groups when the pre-treatment measures were subjected to an analysis of variance procedure.

Frequency

Micturition is abnormally frequent when it occurs more than two hourly or seven times a day.

There were no significant changes in the psychotherapy group. The pre-treatment mean for the whole group was 11.5 and the follow-up mean was 9.8.

Thirteen patients in the bladder training group completed pre-treatment diaries. Their mean urinary frequency was 9.5 times daily. The seven patients who also completed follow-up diaries had a pre-treatment mean of 9.2 and a follow-up mean of 6.8. This difference just failed to reach significance ($p<0.07$) for the pre-treatment to follow-up comparison (figure 10.6).

In the propantheline group nine patients completed pre-treatment and follow-up diaries; they showed a significant improvement ($p<0.005$) from a mean of 10.8 pre-treatment to 8.3 at follow-up. However, the thirteen patients who completed the pre-treatment diaries had a mean of 10.2 and the difference between this mean and the follow-up mean was not significant.

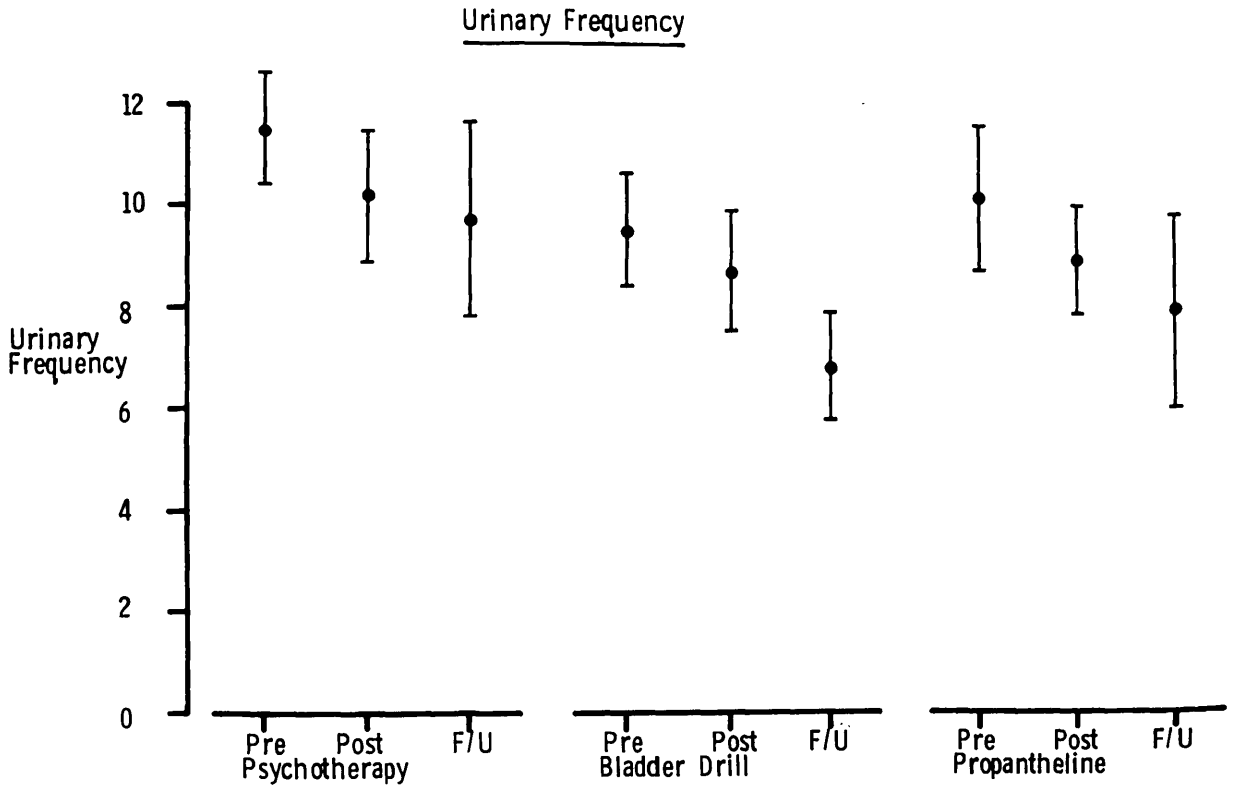

Figure 10.6

Thus all three groups started with moderately severe frequency and showed some improvement after treatment which was sustained at follow-up. In the propantheline group this improvement was significant though the actual difference in means was modest (10.8 to 8.3). Although the improvement in the bladder training group just failed to reach statistical significance the change was in the

expected direction and it was only in this group that the post-treatment mean was within the normal range (i.e. no longer a symptom).

Urgency

The symptom of urgency was graded on a four point scale (figure 9.1). The results are presented in figure 10.7. All groups improved after treatment; in the psychotherapy and propantheline groups further benefit was seen at follow-up. A chi-squared test was performed and it was only in the psychotherapy group that urgency improved significantly for the pre-treatment to post-treatment comparison ($p<0.05$, likelihood ratio chi-sq $p<0.01$).

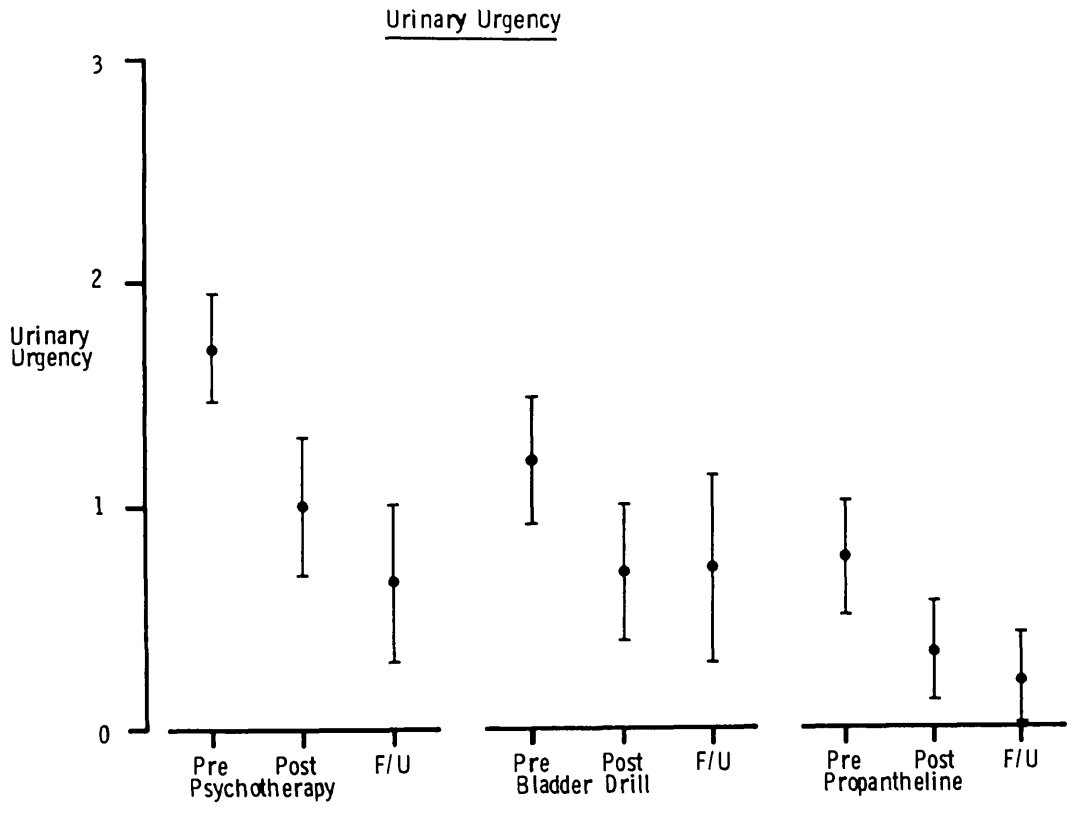

Figure 10.7

Nocturia

For the pre-treatment to follow-up comparison the psychotherapy group showed a significant improvement (mean score 1.4 to 0.03 $p<0.01$). For the 9 psychotherapy

patients who completed diaries at all three points, there was also a significant improvement for the post-treatment to follow-up comparison (mean score 1.0 to 0.03 $p<0.05$). There was only a modest trend for nocturia to improve in the propantheline and bladder training groups (figure 10.8).

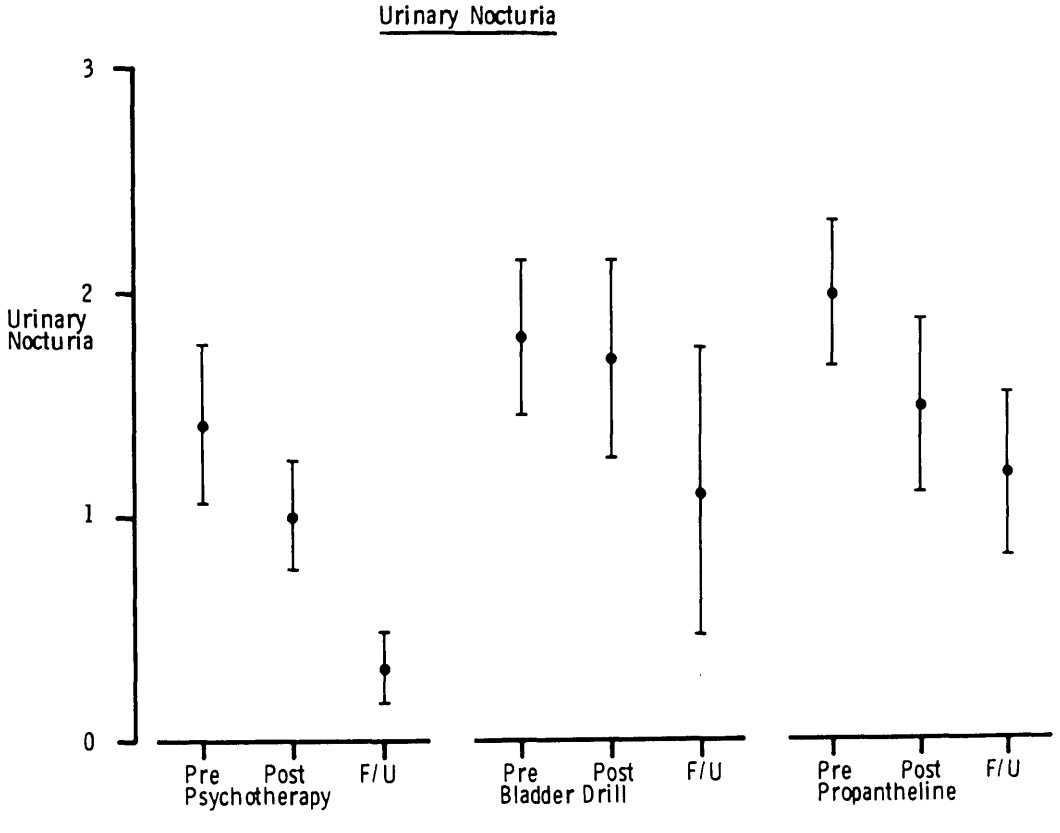

Figure 10.8

Incontinence

The bladder diaries were graded on a nine point scale as described in the methodology. However, in the event few patients scored more than three so for the purposes of analysis the scores were consolidated into three grades as follows:

GRADE	SCORE	CLINICAL MEANING
0	0	symptom free
1	1	a minor symptom, wet pants up to seven times during the week
2	2 to 9	wet pants on more than seven occasions during the week or soaked pants or emptied bladder on one or more times during the week.

Figure 10.9 shows the results of the incontinence scores. Urinary incontinence improved in all three groups. In the psychotherapy group there were no patients with clinically significant incontinence at follow-up. This improvement was statistically significant (pre-treatment to follow-up comparison $p<0.01$). There were no statistically significant differences in the bladder training or propantheline groups.

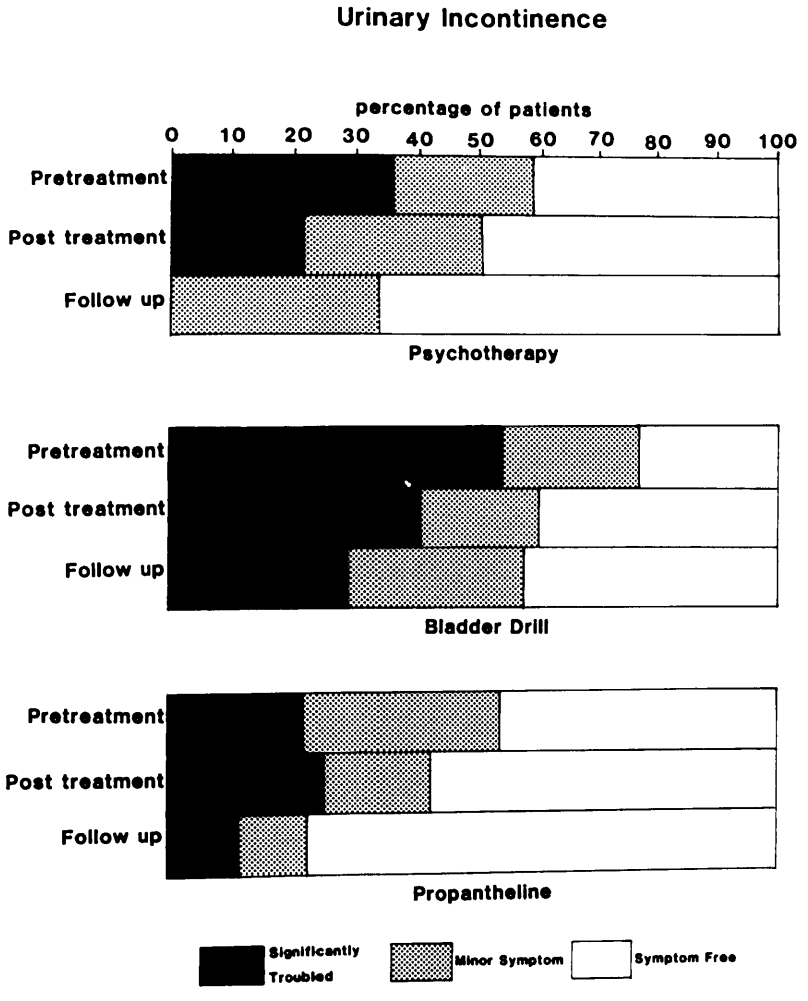
Urinary Incontinence
percentage of patients
0 10 20 30 40 50 60 70 80 90 100
Pretreatment
Post treatment
Follow up
Psychotherapy
Pretreatment
Post treatment
Follow up
Bladder Drill
Pretreatment
Post treatment
Follow up
Propantheline
Significantly Troubled
Minor Symptom
Symptom Free

Figure 10.9

Summary of Analysis of Bladder Diaries

As judged by the bladder diaries, all three groups showed improvement in urinary symptoms. Urinary frequency improved significantly in the propantheline group. Although improvement in the bladder training group just failed to achieve statistical significance the post-treatment result was within the normal range. Psychotherapy did not improve the symptom of frequency. This group did, however, improve significantly on measures of urgency, nocturia and urinary incontinence.

Psychological Measures

All patients completed questionnaires at the designated times and thus all are evaluable.

In order to ensure reliable and valid base-line measures of psychological state the questionnaires were administered twice before treatment, allowing at least one month between interviews. A paired *t*-test was carried out to compare the results of interviews one and two and this showed no significant differences. Consequently, in the rest of the analysis interview one was taken to be the base-line measure.

As described in the methodology, the first interview was carried out just before the patient was seen in the clinic. The second interview was carried out just prior

to cystometry. If the referral letter strongly suggested DI or SU, a routine assessment outpatient appointment was sometimes omitted, and patients were seen directly on the unit. Thus there might be only one opportunity to administer questionnaires before cystometry. For those patients who were allocated to the propantheline group only three patients were initially seen in the clinic. Following diagnosis by cystometry patients were then unwilling to wait a month before starting treatment and so did not complete a second pre-treatment questionnaire. For those patients allocated to psychotherapy or bladder training this problem did not arise as patients were able to accept that there would be a short delay before treatment could be organised.

On the series of figures from 10.10 to 10.19 the numbers on the horizontal axis refer to the interview number as follows:

1 - interview one, before cystometry or any treatment
2 - interview two, approximately one month later, just before treatment
3 - interview three, at the end of treatment
4 - interview four, at follow-up approximately three months after interview three

Expectation of Treatment

Figure 10.10 shows the patients' expectation of treatment before and after treatment. There were no differences in the bladder training and psychotherapy groups. However, following treatment the propantheline group showed a statistically significant lower expectation of treatment ($p<0.01$).

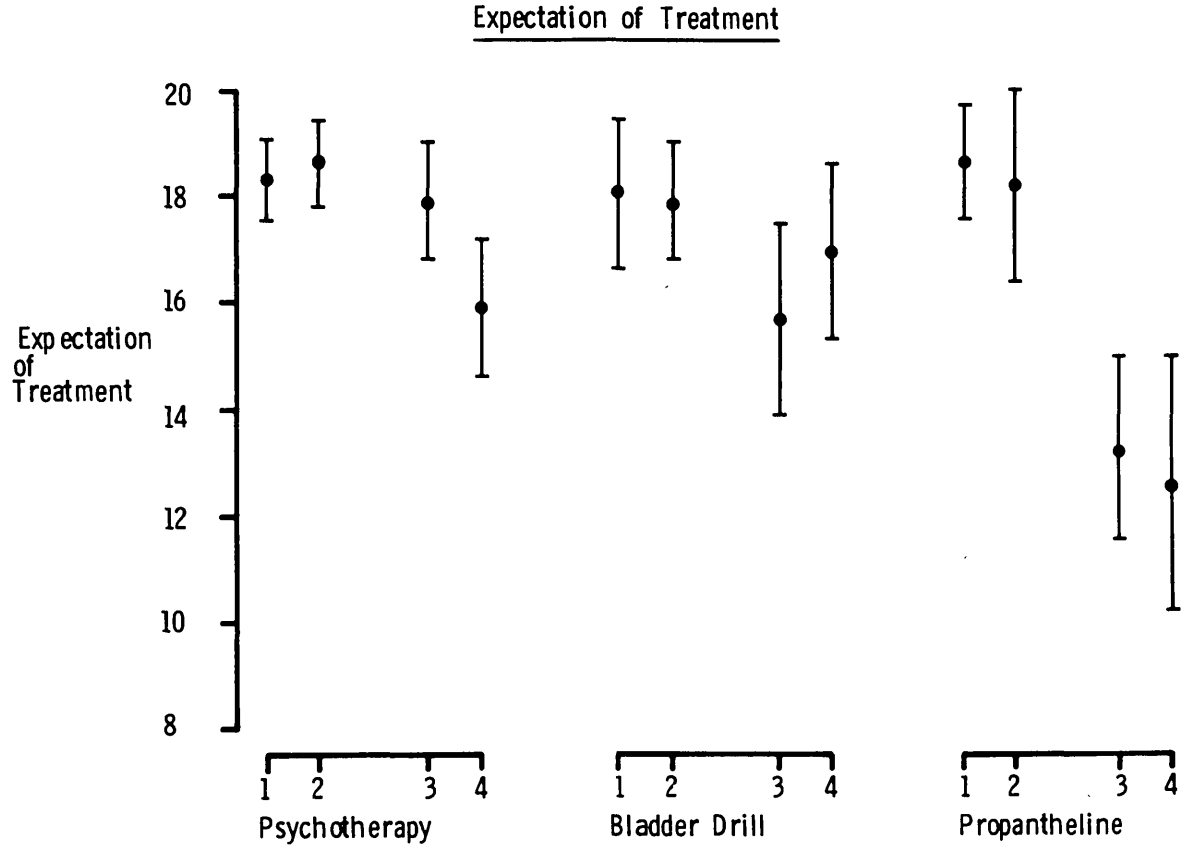

Figure 10.10

Anxiety Measures

On the CCEI anxiety scale the pre-treatment scores in all groups were significantly greater than normal (normal population mean score 5.4 ± 0.17) and there were no major post-treatment trends (figure 10.11).

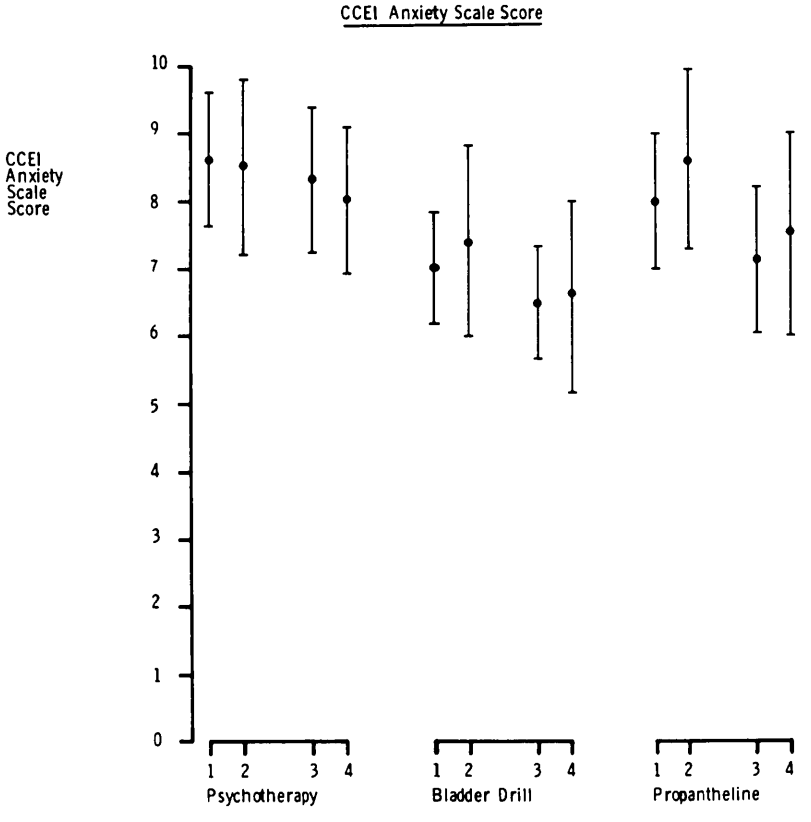

Figure 10.11

On the Spielberger trait anxiety scale (figure 10.12) the pre-treatment scores were again above normal. There were no significant changes in the psychotherapy or bladder training groups. The follow-up propantheline score (mean 38.3) is lower than those pre- and immediately post-treatment (mean 45); this reduction in trait anxiety was not statistically significant (p=0.25), but does represent a fall into the normal range (see figure 7.11).

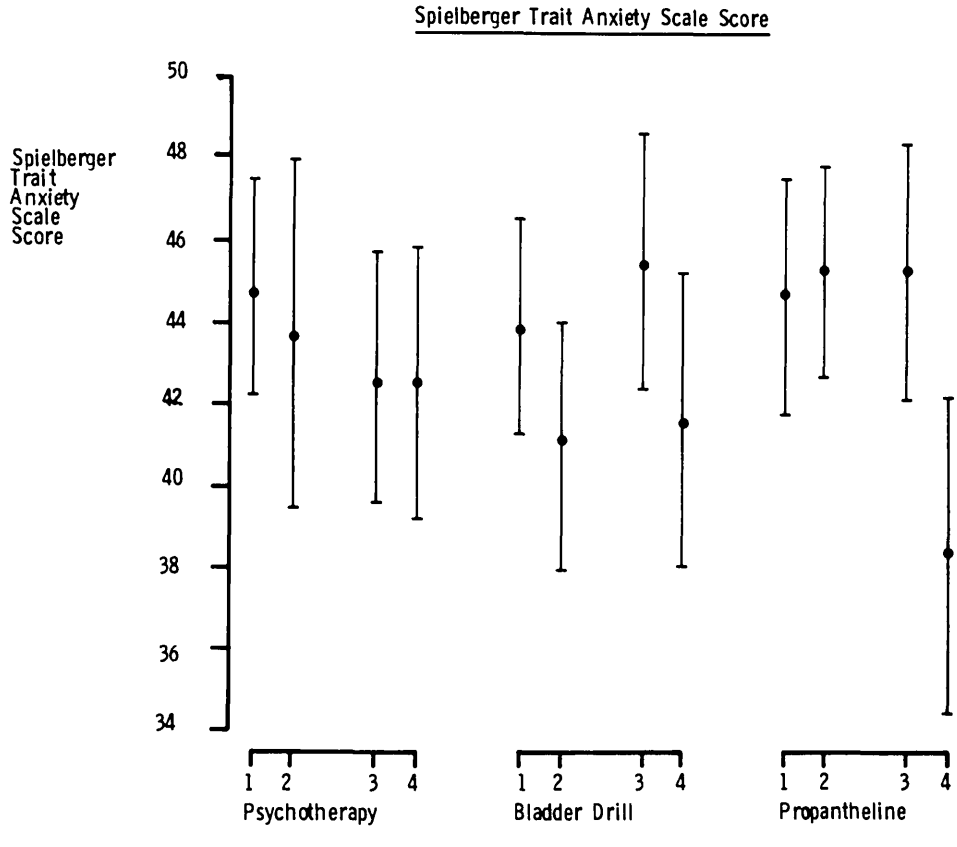

Figure 10.12

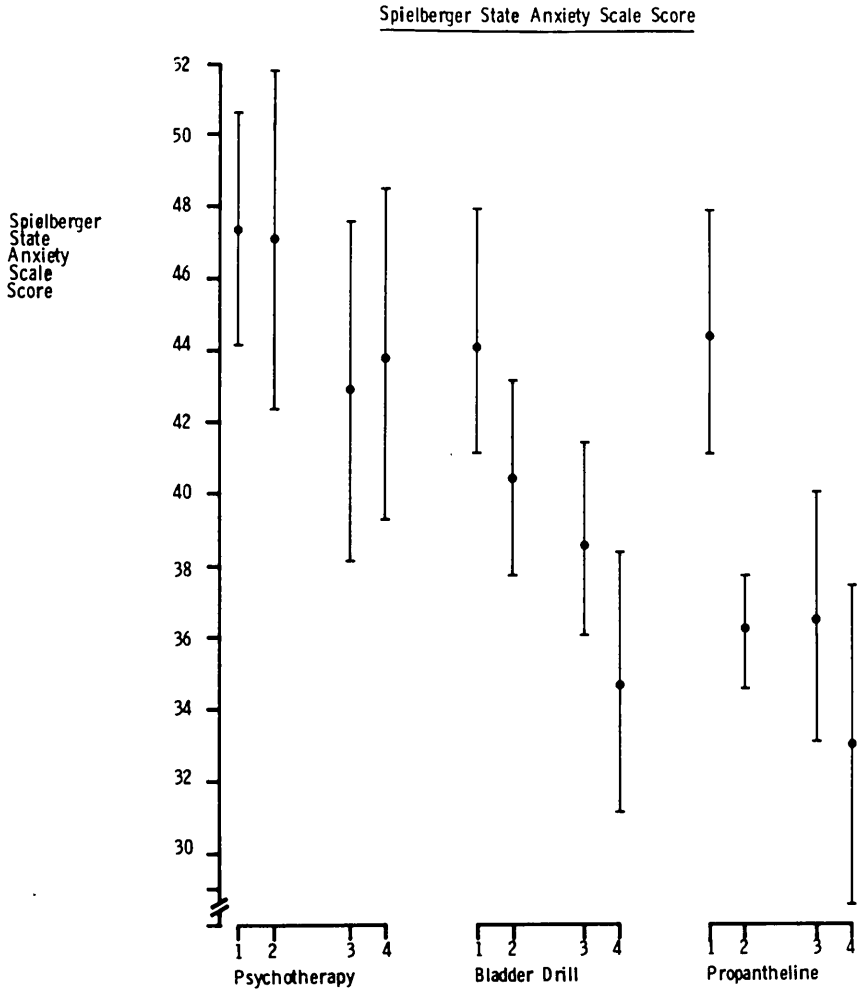
Spielberger State Anxiety Scale Score
Spielberger State Anxiety Scale Score
52
50
48
46
44
42
40
38
36
34
32
30
1 2 3 4
Psychotherapy
1 2 3 4
Bladder Drill
1 2 3 4
Propantheline

Figure 10.13

On the Spielberger state anxiety scale (figure 10.13) there were no major changes in the psychotherapy group. In the bladder training group there was a significant reduction in anxiety immediately after treatment and the trend continued in the follow-up period (pre-treatment to follow-up paired *t*-test $p<0.005$). A similar pattern was seen in the propantheline group (pre-treatment to follow-up paired *t*-test $p<0.05$). The apparent difference between interviews one and two in the propantheline group can be explained by the fact that only three patients in this group completed interview two.

It is interesting to note that there were no changes on either the CCEI anxiety scale or Spielberger trait scale. Improvement in both the bladder training and propantheline groups occurred only on the Spielberger state scale.

Depression

The Wakefield depression scale scores are shown in figure 10.14 and the CCEI depression scale scores in figure 10.15. Mean scores in all groups pre- and post-treatment were above the normal range. There were no significant differences in the psychotherapy or propantheline groups on either scale. Following treatment however, the bladder training group showed a significant

improvement on the Wakefield scale (paired *t* test for the pre-treatment to follow-up scores $p<0.05$). On the CCEI depression scale the improvement just failed to reach statistical significance (paired *t* test $p<0.06$).

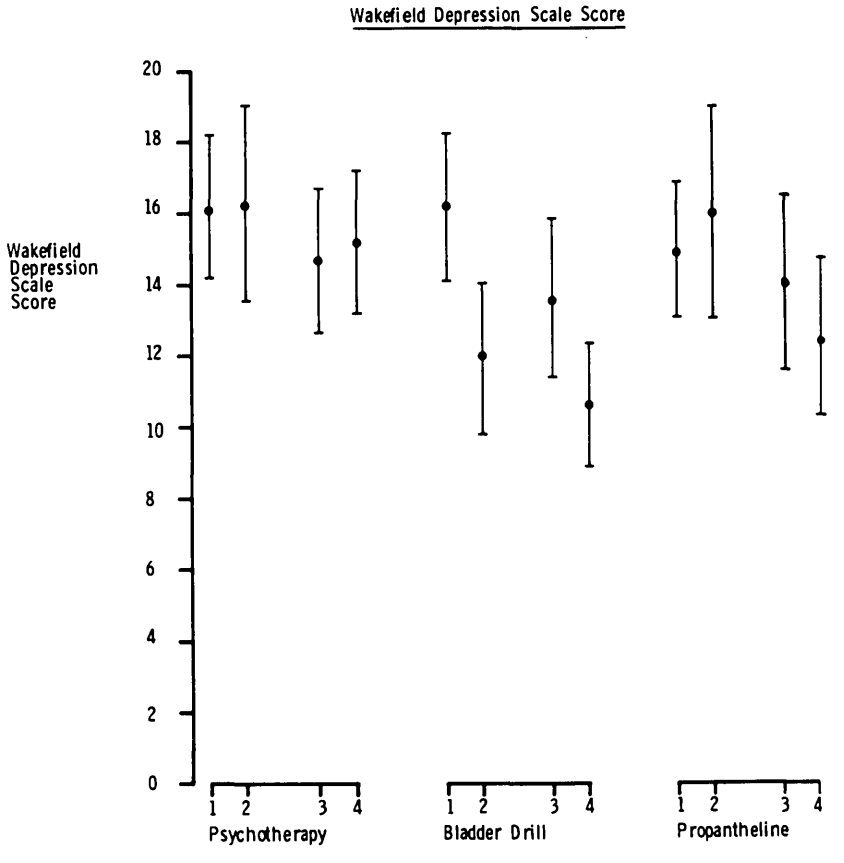

Figure 10.14

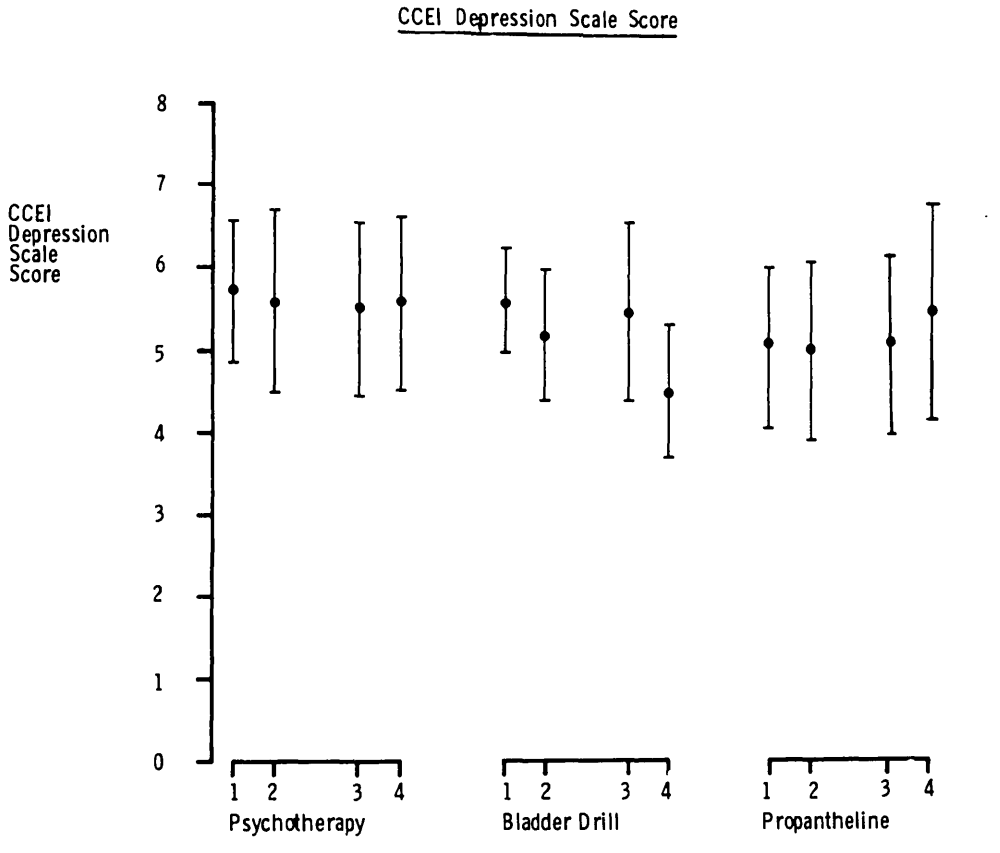

Figure 10.15

Phobic Anxiety

Before treatment, the psychotherapy group manifested more phobic anxiety, (mean score 7) compared with a normal population (mean 4.7). There were no significant changes on this scale. There was however, a trend towards

improvement in the bladder training group and a tendency to deterioration in the propantheline group (see figure 10.16).

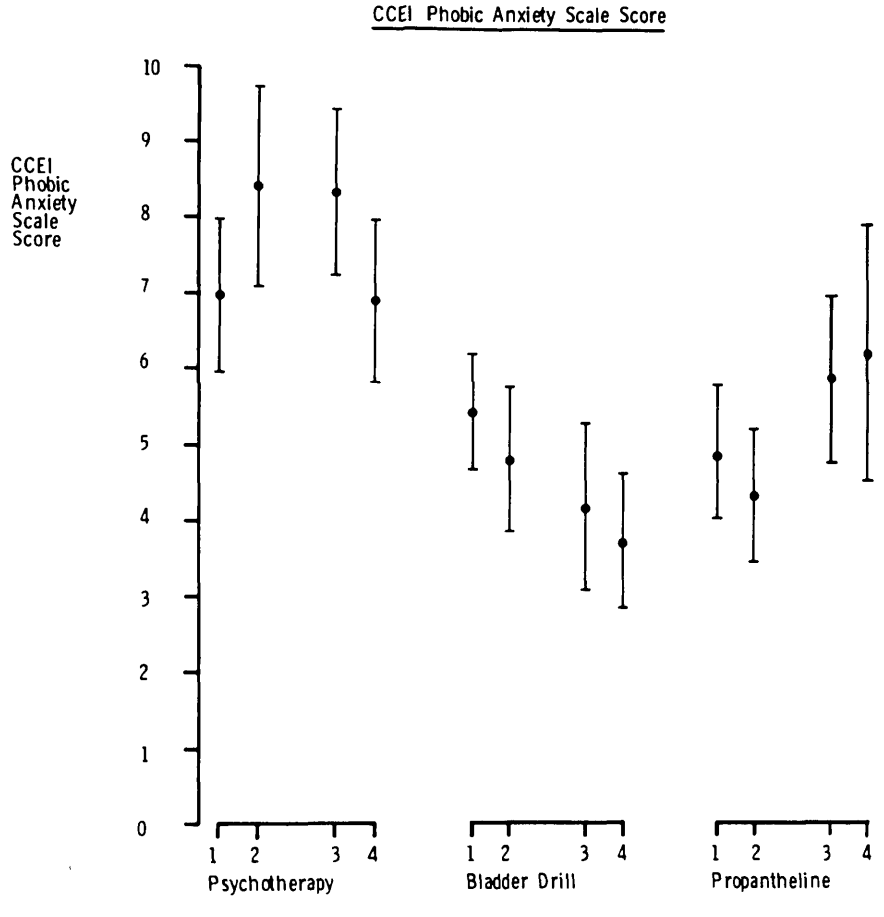

Figure 10.16

Obsessional Scale

Pre-treatment scores in all groups overlapped considerably with the normal mean of 7.4. There were no significant changes with therapy. Both the bladder training and propantheline groups showed a trend towards increasing obsessionality after treatment (see figure 10.17). In neither case was this significant.

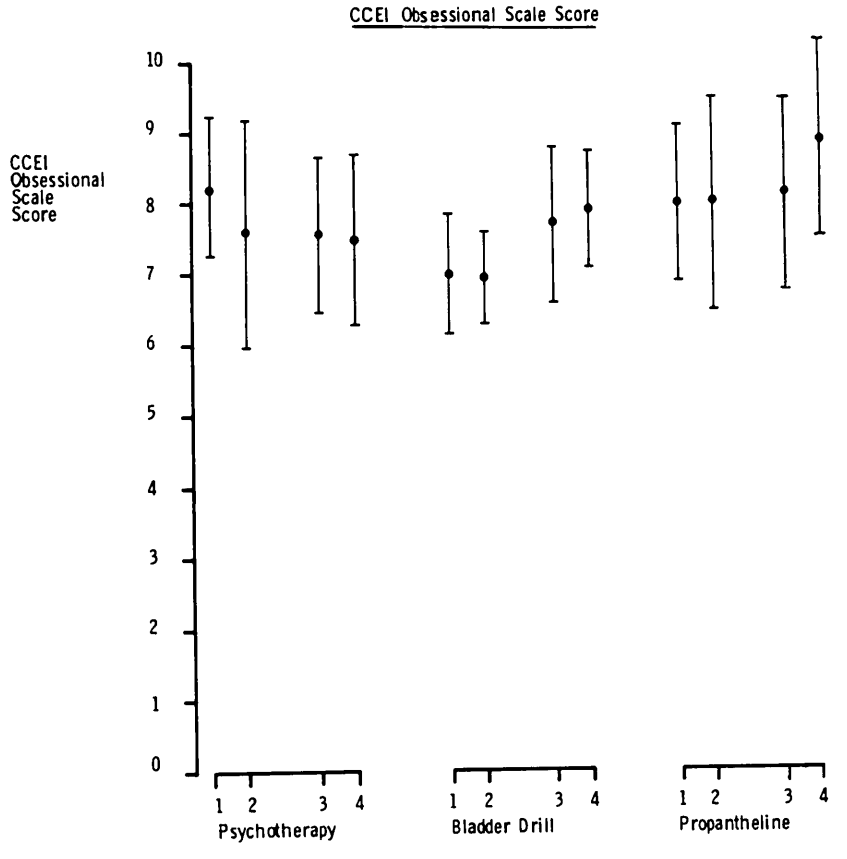

Figure 10.17

Somatic Complaint

The pre-treatment scores in the bladder training and propantheline groups overlapped with the normal range, while that of the psychotherapy group exceeded the normal. There were no significant changes in either the bladder training or propantheline groups. However, following treatment the psychotherapy group showed a significant reduction in somatic complaint, bringing the previously high scores down to normal (*t* test $p<0.05$). This represents a reduction in physical symptoms unrelated to the urinary complaint (figure 10.18).

Hysteria Scale

Mean pre-treatment scores exceeded normal (mean 2.9) in all three groups. There were no significant changes in any of the groups following treatment (figure 10.19). In the propantheline group, the discrepancy between the results at interviews one and two is explained on the basis that only 3 patients were assessed at a second pre-treatment interview. Also, in this group there was a suggestion of deterioration at follow-up.

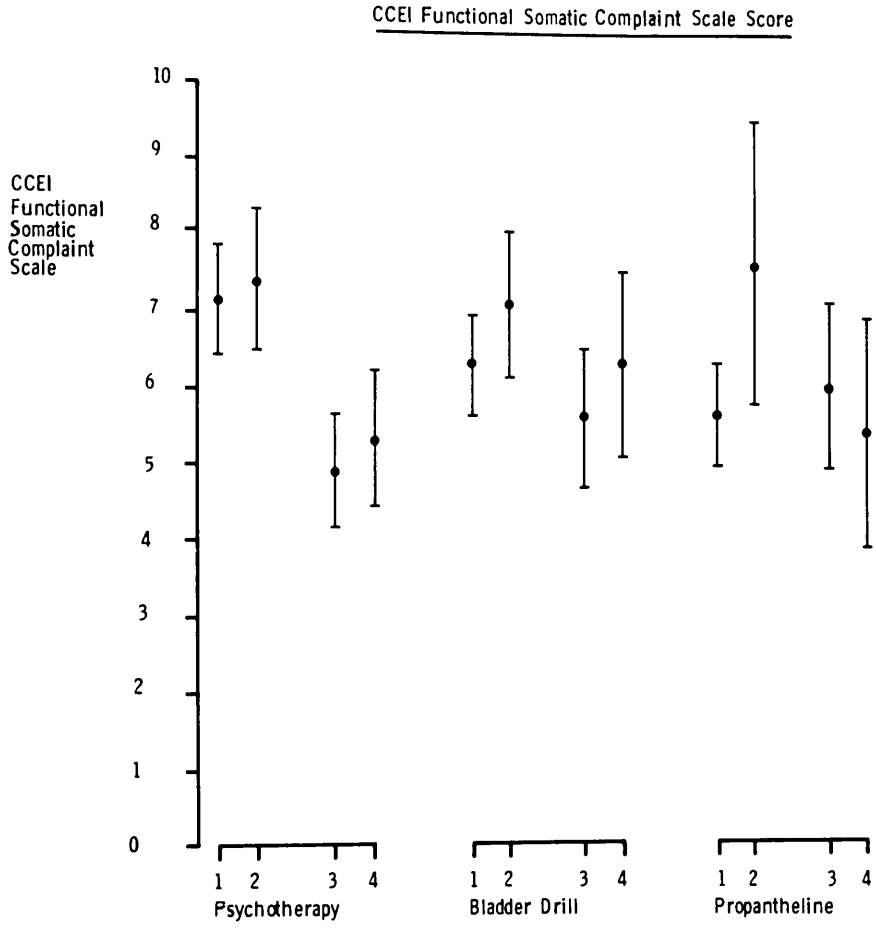
CCEI Functional Somatic Complaint Scale Score
CCEI Functional Somatic Complaint Scale
10
9
8
7
6
5
4
3
2
1
0
1 2 3 4
Psychotherapy
1 2 3 4
Bladder Drill
1 2 3 4
Propantheline

Figure 10.18

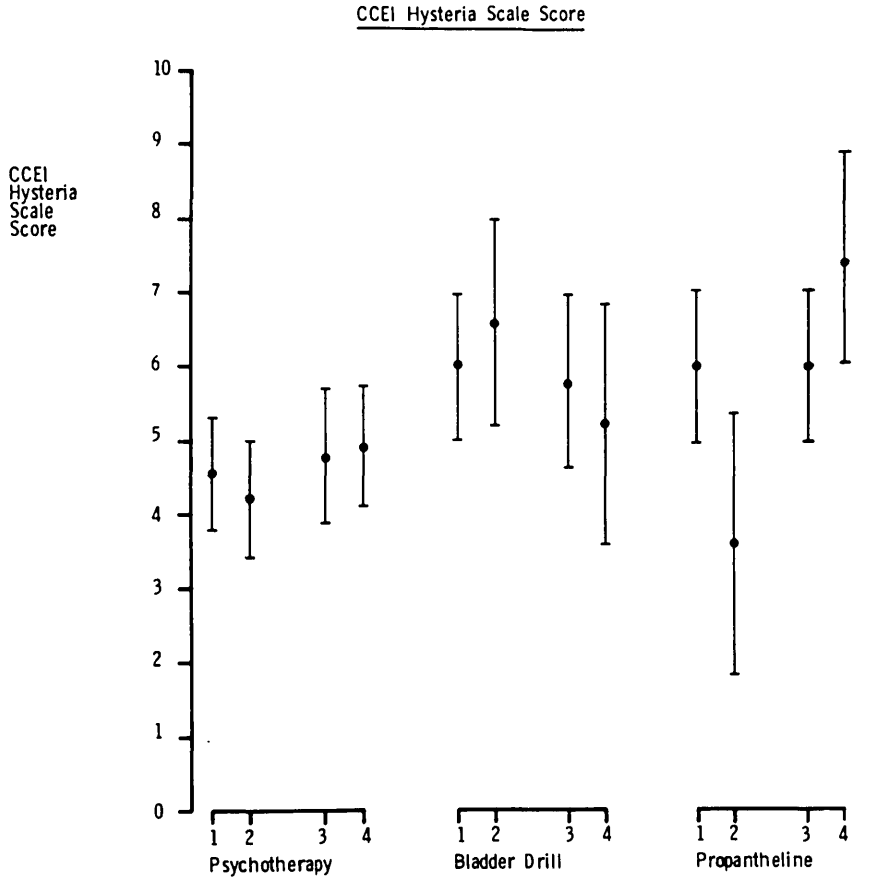
CCEI Hysteria Scale Score
CCEI Hysteria Scale Score
10
9
8
7
6
5
4
3
2
1
0
1 2 3 4
Psychotherapy
1 2 3 4
Bladder Drill
1 2 3 4
Propantheline

Figure 10.19

Summary of psychological questionnaires

In accordance with the findings of the clinic survey, the patients were abnormally anxious, depressed and phobic before treatment. After treatment the psychotherapy group showed no change on measures of anxiety and depression. They did however, improve on the somatic complaint scale of the CCEI, with abnormally high pre-treatment scores falling to within the normal range. The bladder training group had improved significantly in terms of state anxiety and depression. There was also a trend towards reduction of phobic anxiety. On the state anxiety scale the propantheline group improved as much as the bladder training group. Both groups showed a trend towards more obsessionality after treatment.

Conclusion

All three groups improved in different ways.

Psychotherapy Group

Cystometry showed a modest trend towards improvement in first sensation and bladder capacity (not significant). There was in contrast a significant and dramatic improvement in urinary urgency, incontinence and nocturia. Against the author's expectation there was no significant change in any psychological measure, with one exception: significantly fewer "somatic symptoms" after treatment as

measured by the subscale of the CCEI which measures possible physical correlates of anxiety.

Bladder Training Group

Treatment was associated with improvement in detrusor pressure rise and first sensation, as measured during cystometry. In parallel with this, there was a change in psychoneurotic profile with reduction in anxiety, depression and phobic anxiety. There was only modest improvement in urgency, nocturia and urinary incontinence. Urinary frequency improved, with the mean score after treatment falling into the normal range in this group only. Although the statistical analysis just failed to reach significance for the improvement in urinary frequency, the fact that the patients reported improvement in state anxiety, phobic anxiety and depression suggests that the change was real.

Propantheline Group

The propantheline group was intended to be an ethically acceptable control group. The cystometry results resembled those of the psychotherapy group, with some benefit in terms of first sensation and bladder capacity (not significant). The patients showed a statistically significant improvement in urinary frequency (but not in other urinary symptoms) and in state anxiety.

This trial has shown that bladder training helps to improve first sensation and urinary frequency. In parallel, anxiety and depression also improved. It seems likely that there is some relationship between the changes in urinary symptoms and psychological profile. However, it is difficult to be sure which is the primary and which is the secondary effect. It also showed that psychotherapy, as carried out in this trial, was the most effective treatment for urinary incontinence, urgency and nocturia.

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CHAPTER ELEVEN

DISCUSSION OF RESULTS

Hypotheses

Page 8 listed a number of hypotheses relevant to the treatment trial and these are now discussed in the light of the findings as presented in the preceding chapter.

Bladder training would be an effective treatment for some patients.

This hypothesis was confirmed. The behavioural treatment was designed to reduce frequency of micturition and this symptom was significantly reduced. There was no generalisation into improvement in urgency or nocturia. There was also a change in psychological status in that patients who received bladder training became less anxious, less depressed and less socially phobic.

Psychotherapy would be an effective treatment for some patients with micturition disorders.

This hypothesis was confirmed. The improvements occurred in the symptoms of nocturia, urgency and urge incontinence. There was no change in frequency. However, there were no changes in measures of anxiety or depression.

It was not predicted that there would be any differential response. That the above two hypotheses are confirmed lends support to the view that individual

components of the package outlined by Frewen (1978) are important in their own right. Possible reasons for this unexpected finding are discussed later in the chapter.

Propantheline would have little effect on urinary symptoms.

This hypothesis was confirmed. Although some workers have found support for the use of anti-cholinergic medication from in vitro studies (for example, Diokno et al. 1972), in clinical practice its usefulness is limited. Cardozo (1979) concluded, "Drugs may produce temporary improvement, but when therapy is stopped the symptoms invariably return".

Patients who symptomatically improved would also improve psychologically.

This hypothesis was partly confirmed. There was improvement for the patients receiving bladder training in terms of anxiety, depression and phobic anxiety. Although the psychotherapy group improved the psychological profiles did not alter with the exception of "functional somatic complaint". The propantheline group improved in terms of state anxiety. These findings are considered further in the discussion of the three treatment groups.

There would be a positive correlation between symptomatic improvement and cystometric findings.

All three groups showed a modest improvement and to some extent, therefore, the hypothesis is confirmed. However, the changes are not marked, and this finding is expanded on under "limitations of methodology".

Data Collection

Cystometry

Cystometry is a moderately invasive and uncomfortable procedure. The clinic nurse was kind and considerate in her technique but of necessity catheterisation involved an invasion of personal privacy. Most patients found it embarrassing and one or two found it frightening and upsetting. At the start of the trial all patients had agreed to undergo repeat cystometry but when the time came only 60% of the sample complied. In the bladder training group it was those patients who had initially been worst who attended for repeat cystometry. They may perhaps have been hoping for further therapeutic intervention. It may have been relevant that their treatment was also carried out by the nurse.

Despite the complex electronics to measure pressure, cystometry remains a relatively crude investigation. For example, all groups had an improvement in mean first

sensation of some 40 mls. However the clinical significance of such a change is difficult to assess.

Whilst the symptom of frequency may be related to first sensation and bladder capacity, cystometry offers little guidance as to the possible disordered physiology of the symptom of urgency. In some patients undergoing cystometry, urgency is experienced during detrusor contractions, but this is by no means invariable. Passage of urine into the proximal urethra may be manifest symptomatically as urgency, but is not measurable cystometrically.

Bladder Diaries

Most patients found that the bladder diaries were tedious to complete accurately. Every encouragement was given, including telephone calls during the week to potential defaulters. However, it was impossible to supervise the completion of the diaries more closely than this. On some occasions patients said they were keeping the diaries when they were not or told me that they had "lost" the form. The excuses were not challenged but the patients were asked to "try again next week".

Psychological Ratings

The questionnaires could be completed under supervision on the unit in a relatively short time. Data on psychological ratings were therefore complete.

The scores for all three groups on the CCEI anxiety and Spielberger trait scales suggests that these patients have constitutionally anxious temperaments. This is supported by the high scores on the hysteria and phobic anxiety scales of the CCEI.

Therapy

Psychotherapy

It was intended that this group should use the portable GSR machine as an aid to relaxation therapy at home. The idea behind this was to make this a treatment aimed at generalised anxiety on different levels. Relaxation did not include any specific bladder exercises. Patients were taught how to use the machine, and were instructed to practise for ten to fifteen minutes daily. Most reported that in the first week they tried two or three times without much success. If this was the case, part of the next session was used to practise under supervision. They were given visual imagery (such as a relaxing beach scene) or progressive muscular relaxation, whichever the patient preferred. Though apparently helpful during the sessions, few patients found benefit in the practise at home and few carried it out. In the event any relaxation effect must therefore have been weak but cannot be discounted.

The results show that psychotherapy can have an impact on urinary symptoms but in this study psychotherapy included a relaxation component which may have had some effect. Nocturia, urgency and incontinence all significantly improved. Indeed, no patient in the psychotherapy group had more than minor incontinence at follow-up. The improvement in this symptom is possibly a reflection of the increased control over urgency. The physiological control of the bladder neck is poorly understood and the possible influence of psychotherapy on this mechanism can only be speculative.

It is not possible to deduce from the data available if the patients with DI or SU were poor sleepers. It may be that nocturia was a result of poor sleeping. When worries were worked through the patients may then have slept better. This hypothesis gains support from the fact that nocturia continued to improve significantly in the follow-up period. Frequency however, was unaltered; different mechanisms might be important in the aetiology and treatment of this symptom.

Although the urinary symptoms improved in the psychotherapy group there was no change on the major psychological ratings. The aim of psychotherapy was to let the patients talk about issues that were important to them, and perhaps to resolve some of their problems. The questionnaires were all self-rating; it may be that after

treatment the patients in the psychotherapy group were more aware of their own anxieties and worries, thus obscuring any improvement. It was only the psychotherapy group that improved on the somatic complaint scale - questions which all relate to somatic correlates of anxiety.

Bladder Training

The essence of bladder training was to train the patient to ignore cues from the bladder at first sensation and to void at set times, eventually at bladder fullness. In this trial, bladder training was intended to be devoid of the supportive, non-behavioural aspects which usually accompany the therapy in clinical practice. The aim was to assess the contribution of "pure" bladder training. The clinic nurse thought that most patients wanted a chance to talk to somebody and she found it uncomfortable to confine discussion to the elements of bladder training and pelvic floor exercises. She was observed and the author was satisfied that her role was that of educator not counsellor. To this extent she complied with the intention of the trial, but perforce this created an uncertainty as to whether bladder training was carried out in its most efficacious way: "warmth, genuineness and empathy" (Truax et al 1966) and other non-specific components may have been therapeutic.

This problem was illustrated very clearly by one case. During the course of therapy one woman suffered a bereavement when her husband died suddenly. Following this she wanted to use the nurse as a sympathetic friend as she had little or no social support. The nurse expressed the briefest of sympathy that social convention would allow, encouraging the patient to continue with the bladder training as it would then mean "one less problem". In the event the patient dropped out at the next session, promising to return when she felt more able to cope with the effort and discipline of bladder training.

After treatment patients in this group had a significant improvement in detrusor pressure rise and a slight decrease in mean bladder capacity. Despite the latter change, there was a significant delay in subjective first sensation of bladder fullness, indicating the importance of factors other than objective physiology in the genesis of urinary symptoms.

These results suggest that bladder training is an effective form of treatment for the symptom of frequency. It may be that the patient has learnt, as a habit, always to void when there was an opportunity. For some patients, this behaviour might have its roots in early childhood. For example, one patient in her mid-twenties only presented for treatment when she changed jobs to work in a bank where they took exception to her frequent absences

from the counter to void. Prior to this, it had not occurred to her that there was anything abnormal in her behaviour. In discussion with her she was certain that this had started in childhood when her mother would always send her to the lavatory before they were to go out anywhere "just in case".

The work from this trial suggests that the symptom of frequency may be a learnt disorder which responds to a direct symptom-orientated treatment approach. Improvement in frequency was associated with reduction in state anxiety, phobic anxiety and depression. This suggests that chronic urinary symptoms may be a source of anxiety and depression, and that patients rated this symptomatic benefit as an important gain. Finally, it is of interest that bladder training, which required adherence to a rigid programme, was associated with a slight increase in obsessionality, as measured by the CCEI.

Medication

Propantheline was the simplest treatment to administer, and no patient reported significant side-effects. At the end of the three month treatment period some patients expressed doubt about stopping medication. Most seemed satisfied with the explanation that their symptoms might now be cured, in spite of the fact that for most there had been little improvement. Certainly, there

was no benefit in terms of suppression of detrusor activity; this was perhaps surprising given that the rationale for using this drug was to inhibit cholinergic-mediated detrusor contraction. There was however improvement in first sensation and frequency. It is possible that an anticholinergic effect results in decreased afferent impulses, and thus a decreased sensation of bladder fullness.

After treatment patients were significantly less anxious than before. This finding would not be predicted by an anticholinergic action in the central nervous system. It is possible that the reduction in reported anxiety was a non-specific, placebo response to therapeutic intervention. Observer rated questionnaires might have shown a different result.

Perception of Treatment

Patients' expectation of treatment as measured by the visual analogue scales fell significantly after treatment with propantheline. Though patients in the bladder training and psychotherapy group were by no means all symptom-free at the end of treatment, the expectation of treatment scores remained high. Presumably, both treatments were considered to be of value, mirroring improvement in urinary symptoms in these two groups.

Although no data is presented it is likely that the patients' perception of psychotherapy and bladder training differ. At the very least one was a treatment carried out by a psychiatrist whilst bladder training was a procedure taught by the unit nurse. This differing perception of therapy might have its own influence on response to questionnaires and to treatment.

Limitations of the Trial

The trial was undertaken to investigate the individual therapeutic aspects of conventional bladder training and to make suggestions for optimising such treatment. Firmer conclusions could have been drawn from a trial with more patients in each limb. However, this study was carried out over a period of two years at a busy urodynamic unit. A prospective treatment study which hoped to achieve greater recruitment would require the setting up of a multicentre trial. The logistics of such trials are formidable and the resources required were not available to the author.

The diagnostic and investigative procedures had inherent limitations. Methods of urodynamic measurement are discussed in chapter four. Notwithstanding the limitations of cystometry it was the only physiological measurement of bladder function that was routinely offered

to patients attending the clinic. Until more is known about the disordered physiology of DI and SU, patient selection for such trials can only usefully be made in accordance with internationally agreed criteria.

In the light of the results, observer rated scales might have been a useful additional measure. However, they do have their own disadvantages such as poorer reliability and validity in comparison to the self-rating scales used in this trial.

Economic Considerations

Resources available to the NHS are scarce. McDonnell (1982) undertook a cost-benefit analysis of the treatment of women with micturition disorders and considered that "if psychiatric treatment is able to cure or relieve symptoms of urgency, urge incontinence or frequency there may be vast non-pecuniary benefit to be reaped from its introduction". She also concluded that "once established, psychiatric treatment is less expensive than conventional methods of treatment".

This trial has demonstrated the efficacy of psychological treatments, in the form of bladder training and psychotherapy. Increasing availability of such therapies would be of considerable benefit to patients and the health service.

Conclusion

This randomised controlled trial was designed to assess the potential of behavioural and brief eclectic psychotherapy in the treatment of DI and SU. Bladder training was an effective treatment for frequency of micturition. Psychotherapy significantly improved symptoms of urgency, urge incontinence and nocturia. These two treatments probably work by different mechanisms, one apparently focussing on the training of new behaviour, the other at a different psychological level where the mechanisms are more diverse and speculative.

The psychotherapy given was intentionally broad based. It included aspects of emotional support, encouragement and reassurance as well as the opportunity to resolve intra-psychic conflicts, marital and family discord. In addition there was the opportunity to learn relaxation. Some patients discussed and worked through conflicts and anxieties but other patients appeared simply to value the supportive aspects.

The mental state altered as a consequence of improvement in urinary symptoms. After bladder training patients were less anxious, depressed and phobic. Similar improvement was not seen in the psychotherapy group. It is possible that any benefit may have been masked by

increasing self-awareness, patients rating themselves highly because of increased introspection. In support of this theory, there was a significant decrease in the physical correlates of anxiety.

The results suggest that patients with symptoms of frequency predominating would respond well to bladder training. Those with urgency and nocturia might derive benefit from broad-based psychotherapy. Most patients have a mixture of symptoms and would probably respond best to bladder training given by an understanding, empathic therapist who was sensitive to their general problems as well as skilled in carrying out bladder training.

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CHAPTER TWELVE

CLINICAL APPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

As a result of the research reported in the preceding chapters further avenues of investigation could usefully be explored. In addition, suggestions are made regarding changes in clinical practice which might benefit patients with DI and SU.

Predictive Questionnaire

Clinically, the most important distinction to make is between GSI and DI or SU, as the current treatment for DI and SU is the same, regardless of cystometry. Some authorities (for example Frewen 1982) suggest that DI is a more serious form of SU and that the symptoms cause the detrusor abnormality. The labels SU and DI may thus represent the same condition, one at a later stage with consequent physical abnormalities. Furthermore, the diagnosis of DI is an arbitrary one: a pressure rise on filling of 15 cms is the cut-off point between the two conditions.

A predictive questionnaire would require development work. The questionnaire would possibly have two main areas of enquiry, symptoms and psychological profile.

Symptoms

GSI and DI or SU can often be diagnosed on the basis of the clinical history (discussed in Chapter four). The main symptom suggestive of GSI is incontinence related to coughing or exercise, in the setting of a reasonably normal pattern of micturition and without urgency. Symptoms suggestive of DI or SU are urgency with or without incontinence, nocturia and frequency.

Psychological Profile

The psychological state of patients with GSI resembles that of patients with other physical symptoms. In the clinic survey there were a number of adjectives and phrases that significantly discriminated between GSI and DI or SU - examples such as "feel secure", "lack self confidence" and "worry over things that don't matter". These phrases and others possibly relating to self esteem could be used as stems with four point replies arranged so that high scores suggest SU or DI.

Inevitably, there would be some miss-classification in that GSI patients are a cross-section of the population. However, by including questions about urinary symptoms miss-classification could be minimised. A pilot questionnaire could then be tested for reliability and validity. The final version might consist of 10 to 12 questions and take ten minutes to complete. Urodynamic

investigations are moderately intrusive and unpleasant for the patient. They are also time consuming of staff and equipment. A predictive questionnaire would be a clinically valuable screening tool in obstetric and gynaecological departments as well as in specialist urodynamic units.

Co-existing Anxiety and Depression

The clinic survey lends weight to the concept that chronic urinary symptoms are associated in a causal manner with anxiety and depression. The questionnaires used here were all self-rating scales and do not replace the need for clinical assessment. Given the high prevalence of patients with symptoms that might be agitated or neurotic depression, routine enquiry about depressive phenomena should be made. Depression should be treated on its own merits; if indicated, antidepressant medication recommended.

Treatment of patients with DI or SU

This research has shown that there is a role for psychological intervention in the treatment of DI and SU. This raises two questions. First, what is the optimum format for treatment and second who should be giving the treatment?

In this randomised trial, "pure" bladder training and eclectic psychotherapy were administered separately. The

former proved most effective for urinary frequency and the latter for urgency, urge incontinence and nocturia. In clinical practice, bladder training is often accompanied by informal supportive psychotherapy from the clinic nurse. This is, of course, appropriate since most patients with DI or SU have both frequency and urgency. Greatest benefit might be derived by extending and refining the psychotherapy given in the course of bladder training.

It is unlikely that surgeons or psychiatrists have the time, nor would it necessarily be an appropriate use of their skills. Much treatment in the health service is already carried out by para-medical staff such as physiotherapists, occupational therapists, nurse practitioners and psychologists.

The necessary skills required for effective treatment of DI and SU can be taught. At the moment there is no training scheme set up; practitioners currently acquire their knowledge and skills in an ad hoc manner. It is to be hoped that in due course suitable training schemes will be organised, perhaps under the auspices of the International Continence Society.

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APPENDIX A

QUESTIONNAIRES

Patients name & hospital number							
Number			Group number		Interview number		
	(1)	(2)		(3)		(4)	

These questions are designed to help us find out more about your problems. Some may not seem to have much to do with your bladder difficulties but I'd be grateful if you'd answer them anyway.

For each of the following questions please put a cross in one of the boxes.

How are your bladder difficulties today?

- ☐ As bad as I could possibly imagine
- ☐ Worse than usual
- ☐ About average for me
- ☐ Better than average for me
- ☐ Not causing me any problems

DO NOT FILL I NUMBERED SQS.

☐ (5)

Do you think the treatment you have come to the hospital for helps everybody?

Everybody 100% ☐☐☐☐☐☐☐☐ Nobody 0%

50%

☐ (6)

How useful do you think the treatment will be for you?

Not useful at all 0% ☐☐☐☐☐☐☐☐ Very useful 100%

50%

☐ (7)

How helpful do you think the treatment will be for you?

Very helpful 100% ☐☐☐☐☐☐☐☐ No help at all 0%

50%

☐ (8)

How successful do you think the treatment will be for you?

Completly successful 100% ☐☐☐☐☐☐☐☐ Not successful 0%

50%

☐ (10)

Generally how troubled are you by your bladder problems?

It makes life not worth living 0% ☐☐☐☐☐☐☐☐ Not at all 100%

50%

☐ (11)

(2)

For the questions on this page please mark with a cross one of the boxes to indicate how you feel right now, at this moment. There are no right or wrong answers. Do not spend too much time on any statement but give the answer which seems to describe your feelings best.

I feel calm.

- ☐ Not at all
- ☐ Somewhat
- ☐ Moderately so
- ☐ Very much so

(12)

I feel secure

- ☐ Not at all
- ☐ Somewhat
- ☐ Moderately So
- ☐ Very much so

(13)

I am tense

- ☐ Not at all
- ☐ Somewhat
- ☐ Moderately so
- ☐ Very much so

(14)

I am regretful

- ☐ Not at all
- ☐ Somewhat
- ☐ Moderately so
- ☐ Very much so

(15)

I feel at ease

- ☐ Not at all
- ☐ Somewhat
- ☐ Moderately so
- ☐ Very much so

(16)

I feel upset

- ☐ Not at all
- ☐ Somewhat
- ☐ Moderately so
- ☐ Very much so

(17)

I am presently worrying over possible misfortunes

- ☐ Not at all
- ☐ Somewhat
- ☐ Moderately so
- ☐ Very much so

18

I feel rested

- [ ] Not at all
- [ ] Somewhat
- [ ] Moderately so
- [ ] Very much so

I feel anxious

- [ ] Not at all
- [ ] Somewhat
- [ ] Moderately so
- [ ] Very much so

I feel comfortable

- [ ] Not at all
- [ ] Somewhat
- [ ] Moderately so
- [ ] Very much so

I feel self-confident

- [ ] Not at all
- [ ] Somewhat
- [ ] Moderately so
- [ ] Very much so

I feel nervous

- [ ] Not at all
- [ ] Somewhat
- [ ] Moderately so
- [ ] Very much so

I am jittery

- [ ] Not at all
- [ ] Somewhat
- [ ] Moderately so
- [ ] Very much so

I feel highly strung

- [ ] Not at all
- [ ] Somewhat
- [ ] Moderately so
- [ ] Very much so

I am relaxed

- [ ] Not at all
- [ ] Somewhat
- [ ] Moderately so
- [ ] Very much so

(4)

I feel content

- ☐ Not at all
- ☐ Somewhat
- ☐ Moderately so
- ☐ Very much so

☐ (27)

I am worried

- ☐ Not at all
- ☐ Somewhat
- ☐ Moderately so
- ☐ Very much so

☐ (28)

I feel over-excited and "rattled"

- ☐ Not at all
- ☐ Somewhat
- ☐ Moderately so
- ☐ Very much so

☐ (29)

I feel joyful

- ☐ Not at all
- ☐ Somewhat
- ☐ Moderately so
- ☐ Very much so

☐ (30)

I feel pleasant

- ☐ Not at all
- ☐ Somewhat
- ☐ Moderately so
- ☐ Very much so

☐ (31)

For the following questions please mark with a cross in one of the boxes to indicate how you <u>generally</u> feel.

I feel pleasant

- ☐ Almost never
- ☐ Sometimes
- ☐ Often
- ☐ Almost always

☐ (32)

I tire quickly

- ☐ Almost never
- ☐ Sometimes
- ☐ Often
- ☐ Almost always

☐ (33)

(5)

I feel like crying

- [ ] Almost never
- [ ] Sometimes
- [ ] Often
- [ ] Almost always

(34)

I wish I could be as happy as others seem to be

- [ ] Almost never
- [ ] Sometimes
- [ ] Often
- [ ] Almost always

(35)

I am losing out on things because I can't make up my mind soon enough

- [ ] Almost never
- [ ] Sometimes
- [ ] Often
- [ ] Almost always

(36)

I feel rested

- [ ] Almost never
- [ ] Sometimes
- [ ] Often
- [ ] Almost always

(37)

I am calm, cool and collected

- [ ] Almost never
- [ ] Sometimes
- [ ] Often
- [ ] Almost always

(38)

I feel that difficulties are piling up so that I cannot overcome them

- [ ] Almost never
- [ ] Sometimes
- [ ] Often
- [ ] Almost always

(39)

I worry too much over something that really doesn't matter.

- [ ] Almost never
- [ ] Sometimes
- [ ] Often
- [ ] Almost always

(40)

I am happy

- ☐ Almost never
- ☐ Sometimes
- ☐ Often
- ☐ Almost always

I am inclined to take things hard

- ☐ Almost never
- ☐ Sometimes
- ☐ Often
- ☐ Almost always

I lack self-confidence

- ☐ Almost never
- ☐ Sometimes
- ☐ Often
- ☐ Almost always

I feel secure

- ☐ Almost never
- ☐ Sometimes
- ☐ Often
- ☐ Almost always

I try to avoid facing a crisis or difficulty

- ☐ Almost never
- ☐ Sometimes
- ☐ Often
- ☐ Almost always

I feel blue

- ☐ Almost never
- ☐ Sometimes
- ☐ Often
- ☐ Almost always

I am content

- ☐ Almost never
- ☐ Sometimes
- ☐ Often
- ☐ Almost always

Some unimportant thoughts run through my mind and bother me

- ☐ Almost never
- ☐ Sometimes
- ☐ Often
- ☐ Almost always

☐ 43)

I take disappointments so keenly that I can't put them out of my mind

- ☐ Almost never
- ☐ Sometimes
- ☐ Often
- ☐ Almost always

☐ (43)

I am a steady person

- ☐ Almost never
- ☐ Sometimes
- ☐ Often
- ☐ Almost always

☐ 50)

I get in a state of tension or turmoil as I think over my recent concerns and interests.

- ☐ Almost never
- ☐ Sometimes
- ☐ Often
- ☐ Almost always

☐ 51)

For each of the following questions please indicate how you feel by putting a cross in one of the boxes.

I feel miserable and sad.

- ☐ a) Yes, definitely
- ☐ b) Yes, sometimes
- ☐ c) No, not much
- ☐ d) No, not at all

I find it easy to do the things I used to

- ☐ a) Yes, definitely
- ☐ b) Yes, sometimes
- ☐ c) No, not much
- ☐ d) No, not at all

I get very frightened or panic feelings for apparently no reason at all.

- ☐ a) Yes, definitely
- ☐ b) Yes, sometimes
- ☐ c) No, not much
- ☐ d) No, not at all

I have weeping spells, or feel like it

- ☐ a) Yes, definitely
- ☐ b) Yes, sometimes
- ☐ c) No, not much
- ☐ d) No, not at all

I still enjoy the things I used to

- ☐ a) Yes, definitely
- ☐ b) Yes, sometimes
- ☐ c) No, not much
- ☐ d) No, not at all

I am restless and can't keep still

- ☐ a) Yes, definitely
- ☐ b) Yes, sometimes
- ☐ c) No, not much
- ☐ d) No, not at all

I get off to sleep easily without sleeping tablets

- ☐ a) Yes, definitely
- ☐ b) Yes, sometimes
- ☐ c) No, not much
- ☐ d) No, not at all

I feel anxious when I go out of the house on my own

- ☐ a) Yes, definitely
- ☐ b) Yes, sometimes
- ☐ c) No, not much
- ☐ d) No, not at all

(49)

I have lost interest in things

☐ a) Yes, definitely
☐ b) Yes, sometimes
☐ c) No, not much
☐ d) No, not at all

☐ (50)

I get tired for no reason

☐ a) Yes, definitely
☐ b) Yes, sometimes
☐ c) No, not much
☐ d) No, not at all

☐ (51)

I am more irritable than usual

☐ a) Yes, definitely
☐ b) Yes, sometimes
☐ c) No, not much
☐ d) No, not at all

☐ (52)

I wake early and then sleep badly for the rest of the night

☐ a) Yes, definitely
☐ b) Yes, sometimes
☐ c) No, not much
☐ d) No, not at all

☐ (53)

CARD No.

1 (54)

(10)

Patients name & hospital number						
Number			Group number		Interview number	
	(1)	(2)		(3)		(4)

The questions are concerned with the way you feel or act. They are all simple. Please put a cross in one of the boxes for each question.

Do you often feel upset for no obvious reason?

- ☐ Yes
- ☐ No

(5)

Do you have an unreasonable fear of being in enclosed such as shops, lifts, etc.?

- ☐ Often
- ☐ Sometimes
- ☐ Never

(6)

Do people ever say you are too conscientious?

- ☐ No
- ☐ Yes

(7)

Are you troubled by dizzyness or shortness of breath?

- ☐ Never
- ☐ Often
- ☐ Sometimes

(8)

Can you think as quickly as you used to?

- ☐ Yes
- ☐ No

(9)

Are your opinions easily influenced?

- ☐ Yes
- ☐ No

(10)

Have you felt as though you might faint?

- ☐ Frequently
- ☐ Occasionally
- ☐ Never

(11)

Do you find yourself worrying about getting some incurable illness?

- ☐ Never
- ☐ Sometimes
- ☐ Often

(12)

(11)

Do you think that 'cleanliness is next to godliness'?

- [ ] No
- [ ] Yes

(13)

Do you often feel sick or have indigestion?

- [ ] Yes
- [ ] No

(14)

Do you feel that life is too much effort?

- [ ] At times
- [ ] Often
- [ ] Never

(15)

Have you, at any time in your life, enjoyed acting?

- [ ] Yes
- [ ] No

(16)

Do you feel uneasy and restless?

- [ ] Frequently
- [ ] Sometimes
- [ ] Never

17)

Do you feel more relaxed indoors?

- [ ] Definitely
- [ ] Sometimes
- [ ] Not particularly

(18)

Do you find that silly or unreasonable thoughts keep recurring in your mind?

- [ ] Frequently
- [ ] Sometimes
- [ ] Never

(19)

Do you sometimes feel tingling or prickling sensations in your body, arms or legs?

- [ ] Rarely
- [ ] Frequently
- [ ] Never

20)

Do you regret much of your past behaviour?

- [ ] Yes
- [ ] No

21)

Are you normally an excessively emotional person?

☐ Yes
☐ No

22)

Do you sometimes feel really panicky?

☐ No
☐ Yes

23)

Do you feel uneasy travelling on buses or the underground even if they are not crowded?

☐ Very
☐ A little
☐ Not at all

24)

Are you happiest when you are working?

☐ Yes
☐ No

25)

Has your appetite got less recently?

☐ No
☐ Yes

26)

Do you wake unusually early in the morning?

☐ Yes
☐ No

27)

Do you enjoy being the centre of attention?

☐ No
☐ Yes

28)

Would you say you were a worrying person?

☐ Very
☐ Fairly
☐ Not at all

29)

Do you dislike going out alone?

☐ Yes
☐ No

30)

Are you a perfectionist?

☐ No
☐ Yes

31)

(31)

Do you feel unduly tired and exhausted?

- ☐ Often
- ☐ Sometimes
- ☐ Never

(32)

Do you experience long periods of sadness?

- ☐ Never
- ☐ Often
- ☐ Sometimes

(33)

Do you find that you take advantage of circumstances for your own ends?

- ☐ Never
- ☐ Sometimes
- ☐ Often

(34)

Do you often feel 'strung-up' inside?

- ☐ Yes
- ☐ No

(35)

Do you worry unduly when relatives are late coming home?

- ☐ No
- ☐ Yes

(36)

Do you have to check things to an unnecessary extent?

- ☐ Yes
- ☐ No

(37)

Can you get off to sleep alright at the moment?

- ☐ No
- ☐ Yes

(38)

Do you have to make a special effort to face up to a crisis or difficulty?

- ☐ Very much so
- ☐ Sometimes
- ☐ Not more than any one else

(39)

Do you often spend a lot of money on clothes?

- ☐ Yes
- ☐ No

(40)

(41)

Have you ever had the feeling you were 'going to pieces'?

- [ ] Yes
- [ ] No

(41)

Are you scared of heights?

- [ ] Very
- [ ] Fairly
- [ ] Not at all

(42)

Does it irritate you if your normal routine is disturbed?

- [ ] Greatly
- [ ] A little
- [ ] Not at all

(43)

Do you often suffer from excessive sweating or fluttering of the heart?

- [ ] No
- [ ] Yes

(44)

Do you find yourself needing to cry?

- [ ] Frequently
- [ ] Sometimes
- [ ] Never

(45)

Do you enjoy dramatic situations?

- [ ] Yes
- [ ] No

(46)

Do you have bad dreams which upset you when you wake up?

- [ ] Never
- [ ] Sometimes
- [ ] Frequently

(47)

Do you feel panicky in crowds?

- [ ] Always
- [ ] Sometimes
- [ ] Never

(48)

(48

Do you find yourself worrying unreasonably about things that do not really matter?

- ☐ Never
- ☐ Frequently
- ☐ Sometimes

(49

Has your sexual interest altered?

- ☐ Less
- ☐ The same or greater

(50

Have you lost your ability to feel sympathy for other people?

- ☐ No
- ☐ Yes

(51

Do you sometimes find yourself posing or pretending?

- ☐ Yes
- ☐ No

(52

PLEASE CHECK THAT YOU HAVE ANSWERED ALL THE QUESTIONS.

Card no. 2

(53)

APPENDIX B

BLADDER DIARY FORM

URODYNAMIC UNIT

Dept. of Obstetrics & Gynaecology
St. George's Hospital, Medical School

Cranmer Terrace
London, SW17 0RE
Telephone: 01-672 9944 Ext.55950 & 55949

URINARY DIARY

NAME.....

UNIT NO .....

WEEK BEGINNING .....

CHART NO.....

Instructions

This chart is designed to help us assess and treat your urinary problems. It will only help us to help you if you take time to fill it in accurately.

Please enter the amount each time you pass urine (measured by jug) or drink any liquid.

e.g.	1 cupful	= 6 oz.	or	175 ml
	1 tumblerful	= 7 oz.	or	200 ml
	1 soupbowl	= 11 oz.	or	300 ml

If you leak urine try to estimate the amount (1 = few drops; 2 = soaked underwear; 3 = emptied bladder). Also note whether you had any warning or urge to pass urine at that time.

Use a blue pen for daytime records and a red pen after you retire to bed.

Example

DAY: *TUESDAY MAY 20*

TIME	INTAKE (ml)	OUTPUT (ml)	LEAKAGE			
			ACTIVITY	Amount	Urge	Wet Bed
07.10		*300*				
08.15			*WASHING*	*2*	*YES*	
08.30	*150*					
09.45		*150*				

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