J Neurol (1999) 246 : 1027–1032

ORIGINAL COMMUNICATION

A. Hennessey
N. P. Robertson
R. Swingler
D. A. S. Compston

Urinary, faecal and sexual dysfunction in patients with multiple sclerosis

Received: 21 August 1998
Received in revised form: 27 April 1999
Accepted: 16 June 1999

N. P. Robertson
Department of Rehabilitation,
Morriston Hospital,
Swansea, SA6 6NL, UK

A. Hennessey
Department of Neurology,
University of Wales College of Medicine,
Heath Park, Cardiff, CF4 4XN, UK

D. A. S. Compston (✉)
University of Cambridge Neurology Unit,
Addenbrooke's Hospital, Hills Road,
Cambridge, CB2 2QQ, UK
e-mail:
alastair.compston@medschl.cam.ac.uk,
Tel.: +44-1223-216751,
Fax: +44-1223-336941

R. Swingler
Dundee Royal Infirmary, Barrack Road,
Dundee, DD1 9ND, UK

Abstract The prevalence and nature of bladder and bowel dysfunction were examined in a population-based study of 221 patients with multiple sclerosis who returned postal questionnaires. This preliminary investigation was supplemented by personal review which also provided information on sexual dysfunction in 174 and laboratory and urodynamic tests in 152 participants. Thirty of 221 (14%) currently used an indwelling catheter, and 84 of the remaining190 (44%) reported symptoms of urinary dysfunction, of which the most common were urgency and frequency. Thirteen of 144 (9%) patients had biochemical evidence of renal dysfunction, and 40 of 132 (30%) had infected urine samples. Eleven of 54 patients in whom investigation of upper urinary tract was thought to be appropriate demonstrated abnormalities. Sixty-four of 221 (29%) patients had experienced faecal incontinence, and 120 of 221 (54%) were constipated. Fifty-six of 68 (82%) men and 55 of 106 (52%) women reported a deterioration in sexual activity, the commonest symptoms being erectile failure in men and fatigue in women.

Key words Multiple sclerosis · Bladder dysfunction · Bowel dysfunction · Sexual dysfunction

Introduction

Epidemiological studies of multiple sclerosis have been used to assess the frequency of particular symptom complexes and to define the socio-economic significance of the disease. The impact of disability on individual patients has usually focused on measurements of mobility. Few studies have dealt with bladder, bowel and sexual dysfunction despite the fact that these not only represent areas of considerable psycho-social importance for affected individuals [5, 18, 28] but are aspects of the disease in which practical and therapeutic intervention may usefully be employed. [9] Many of the existing studies are based on clinic cohorts which are not necessarily representative of the general population.

Since the care of multiple sclerosis is of considerable importance for neurologists, population-based studies of bladder, bowel and sexual dysfunction allow complete care packages to be planned for these patients and suggest practical measures in which interventions may improve quality of life.

Methods and materials

A population-based register of patients with definite or probable multiple sclerosis according to the criteria of Poser et al. [22] living in south Glamorgan was used as the basis for a survey of bladder, bowel and sexual function. Details of this register have previously been published [12, 27]. The present survey was conducted in the first instance by postal questionnaire and supplemented thereafter by out-patient review in a proportion of cases.

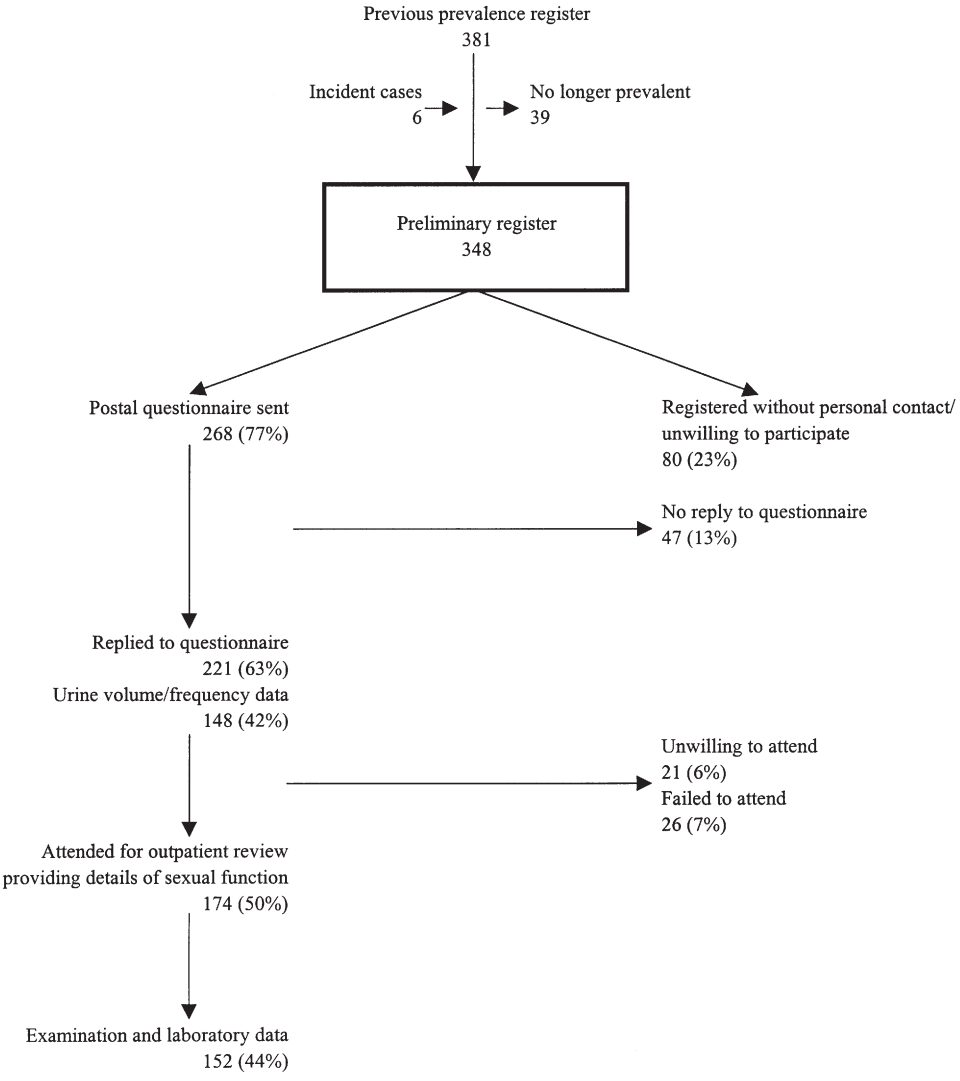

Fig. 1 Patient ascertainment algorithm

The questionnaire was based on topics routinely assessed at continence clinics, and couched in terms that could be easily be understood; sensitive issues were avoided and the postal questionnaire was confined to enquires about bladder and bowel symptoms. Patients were instructed on how to perform a urinary frequency-volume chart and invited to record details over a 1-week period. Results obtained from this part of the study were compared with published normal values [4]. Patients using a condom or catheter drain did not contribute to this part of the survey.

In order to keep the postal questionnaire simple and to maximise compliance, a number of sensitive topics and other details were omitted. Individuals were invited to attend for out-patient review at which additional historical information was obtained, and physical examination and laboratory investigations were performed. The structured interview sought to elicit further details of bladder and bowel dysfunction; sexual symptoms were discussed after obtaining patients' consent to proceed with this part of the interview, and a physical examination was carried out, with collection of samples in order to assess renal function and urinalysis. Upper renal tract investigation was not routinely performed, but abdominal X-ray, renal ultrasound, intravenous pyelography and urodynamic studies were carried out when indicated by the symptoms, signs or screening investigations.

Sources of prevalent patients and data are displayed in Fig. 1. Eighty patients on the preliminary register were not contacted either because they had already expressed an unwillingness to participate in further research or their initial registration had been without personal contact. Thirty-nine patients on the original register were no longer prevalent either because they had died or moved out of the area. Reminders were posted to those who failed to reply after 6 and 12 weeks. Data were eventually available on 221 patients, representing 63% of patients prevalent at the time of the study and 82% of those from whom information had been sought.

Results

In each part of the study patients were demographically representative of the prevalent population (see Table 1). In assessing the results, denominators were adjusted to exclude those patients who were unable to provide a definitive answer to particular items within the questionnaire.

Table 1 Comparison of prevalent and study populations

	Original prevalent population (n = 381)	Study population (n = 221)
Sex ratio F:M	2:1	2:1
Mean age (years)	48.8	50.2
CDMS	319 (83.7%)	196 (88.7%)
LSDMS	20 (5.2%)	10 (4.5%)
CPMS+LSPMS	42 (11.0%)	15 (6.8%)
EDSS (Sphincter) = 0	114/301 (38.0%)	73/221 (33.0%)

Bladder

Thirty of 221 (14%) individuals were currently using an indwelling catheter. Of the remainder, 101/191 (53%) were symptomatic, but in only 64/191 (34%) had their complaints been noticeable over the past month. The urinary problems had been severe enough to prevent the patient leaving home in 37/191 (19%), attending social functions in 28/191 (15%), or working 2/191 (1%). Excluding catheterised patients, urinary frequency was a common problem with 145/191 (76%) of individuals micturating more than five times and 32/191 (17%) more than ten times a day. Ninety-one of 191 (48%) patients regularly needed to pass urine during the night, and in 52/191 (27%) this occurred more than once. One hundred and sixty-six of 191 (87%) individuals were usually aware of bladder fullness, and 15/191 (8%) had absent sensation of bladder fullness. One hundred and thirty-five of 191 (71%) could not suppress the desire to micturate when the bladder was full, often requiring immediate access (98/191; 51%), or were likely to be incontinent (37/191; 19%) as a result of delay. Once the need arose, 68/191 (36%) patients needed to micturate within 2 min. One hundred and ten of 191 (58%) patients reported small voiding volumes, and 92/191 (48%) had difficulties initiating micturition or maintaining a good stream (Table 2).

Only 81/191 (42%) patients had never been incontinent of urine with common problems being dribbling after passing urine or stress incontinence although only 8/191 (4%) of cases regularly passed large volumes. Fifty-six of 56/191 (29%) patients had suffered symptoms strongly suggestive of urinary tract infection, and in 18/191 (9%) this had occurred within the past month. In 25/191 (13%) cases this had required a hospital admission for urinary tract infection, and only 109/191 (57%) had never taken antibiotics for this indication.

Table 2 Urinary symptoms in 191 non-catheterised patients with probable or definite multiple sclerosis

Symptom	n	%
Frequency	145	76
Urgency	135	71
Incontinence	110	58
Nocturia	91	48
Hesitancy/poor stream	92	48
Absent bladder sensation	15	8

Fifty-five of 221 (25%) of patients had required use of a urinary catheter at some stage of their illness, and a further 6/221 (3%) practised self intermittent catheterisation. Of those who were catheterised at the time of the study, 24/30 (80%) required help with maintenance from someone outside the family. The in-dwelling urinary catheter had been in use for a mean period of 3.6 years. Problems were commonplace; 21/30 (70%) reported leaking around the catheter and blockages had occurred in 19/30 (63%). In addition, 9/74 (12%) men wore a condom sheath and 46/147 (31%) women wore pads to aid continence.

Urine volume charts

The mean daily frequency of micturition was 8.4 and the mean number of episodes of nocturia 5.6/week (n = 148). The mean maximum volume passed was 414 ml on each occasion.

Bowels

One hundred and twenty of 221 (54%) patients considered themselves to be constipated. Forty-eight of 221 (22%) individuals habitually used a rectal enema, and this required assistance from someone outside the family in 32/48 (67%) users. Sixty-four of 221 (29%) had experienced loss of bowel control, and in 11/221 (5%) this occurred frequently. One patient had a colostomy for control of constipation.

Sexual function

There were 174 completed questionnaires, including 68 men and 106 women. Sexual orientation and marital sta-

Table 3 Marital status and sexual orientation of 174 prevalent patients with multiple sclerosis

	Women (n = 106)		Men (n = 68)		Total (n = 174)	
	n	%	n	%	n	%
Sexually active	58	55	47	69	105	60
Single	15	14	7	10	22	13
Married	66	62	48	71	114	66
Divorced/separated	14	13	11	16	25	14
Widowed	11	10	2	3	13	7
Heterosexual	103	97	68	100	171	98
Homosexual	2	2	0	0	2	1
Bisexual	1	1	0	0	1	1

tus for the patients taking part in this section of the survey are outlined in Table 3. Fifty-six of 68 (82%) men and 55/106 (52%) women reported deterioration in sexual activity since developing multiple sclerosis. The duration of these alterations in sexual activity was 16.3 years in men and 8.7 years in women. In the sexually active informants, intercourse occurred less than once per month in 9/68 (13%) men and 6/106 (6%) women; conversely, 20/106 (19%) affected women were participating in sexual activity two or more times each week, compared with 3/68 (4%) affected men. The causes of sexual dysfunction are listed in Table 4. Despite these problems 32/68 (47%) men and 65/106 (61%) women were satisfied with their sexual activity.

Table 4 Symptoms of sexual dysfunction in patients with multiple sclerosis

	Women (*n* = 106)		Men (*n* = 68)		Total (*n* = 174)	
	n	%	*n*	%	*n*	%
Fatigue	39	37	26	38	65	37
Diminished sensation	26	25	19	28	45	26
Diminished libido	34	32	29	43	63	36
Diminished orgasm	13	12	–	–	–	–
Anorgasmia	17	16	–	–	–	–
Diminished arousal	20	19	–	–	–	–
Diminished erection	–	–	44	65	–	–
Diminished maintenance of erection	–	–	37	54	–	–
Diminished ejaculation/ orgasm	–	–	21	31	–	–
Spontaneous nocturnal erection	–	–	18	26	–	–
Impaired dexterity	13	12	13	19	26	15
Spasticity	26	25	16	24	42	24
Immobility	29	27	38	56	67	39
Permanent catheter	7	7	13	19	20	11
Contractures	3	3	4	6	7	4
Incontinence	21	20	16	24	37	21
Urinary tract infections	2	2	2	3	4	2

Examination and laboratory investigation

Information was available on 152 participants. All patients who attended and completed the questionnaire relating to sexuality underwent physical examination and investigations, but some procedures were not performed in every individual. The bladder was palpable in 10/152 (7%), the bowel was distended in 8/152 (5%), the liver in 2/152 (1%), and an unidentified abdominal mass was present in 12/152 (8%). Rectal examination was performed in 49 patients; anal tone, contraction or reflex activity was reduced in 2 (4%), 1 (2%) and 3 (6%) patients, respectively. The rectum appeared loaded with faeces in 16/49 (33%). Five of 18 (28%) men had prostatic enlargement.

Thirty-one of 146 (21%) individuals had a haemoglobin below 11 dg/l. Random urea was greater than 6.7 mmol/l in 13/144 (9%), and creatinine was greater than 150 µmol/l in 4/122 (3%). Middle or catheter stream urine was abnormal in 59/132 (45%) samples. Abnormalities included infection in 40/132 (30%: usually due to coliforms), haematuria (21/135: 16%), glycosuria (10/135: 8%) and proteinuria (5/135: 4%) of samples.

Abdominal X-ray was abnormal in 4/65 (6%) due to the presence of renal stone (2) or other abnormality (2). Flow rates were measured for 25 men and 36 women and were analysed using age-sex specific normal values. Twenty-nine of 61 (48%) had a low flow rate; 27/61 (44%) had a reduced voiding volume, and 35/61 (57%) an increased residual volume. Urodynamic studies demonstrated an abnormality due to hyperreflexia, dyssenergia or obstruction in 33/47 (70%) individuals. Upper urinary tract investigations were abnormal in 11/54 (20%) individuals due to the presence of urinary tract dilatation (6), bladder diverticulae (2), clubbed calyces (2), and renal or ureteric stone (1).

Discussion

Integrity of the central nervous system pathways and particularly those fibres that connect the pontine micturition

Table 5 Contemporary studies of symptoms of bladder dysfunction in multiple sclerosis (percentages)

Study	*n*	Urgency	Frequency	Urge incontinence	Hesitancy	Retention
Sachs et al. 1921 [25]	57	31	–	37	49	–
Langworthy 1938 [16]	97	54	33	34	40	–
Carter et al. 1950 [7]	36	24	17	50	–	17
Miller et al. 1965 [18]	321	60	50	36	33	2
Bradley et al. 1973 [6]	90	86	60	–	28	20
Philp et al. 1981 [21]	52	61	59	47	25	8
Goldstein et al. 1983 [10]	86	32	32	49	–	–
Awad et al. 1984 [2]	47	85	65	72	36	–
Gonor et al. 1985 [11]	64	70	48	56	30	–
Betts et al. 1992 [3]	170	85	82	63	49	–
Present series, 1999	191	71	76	19	48	–

centre to the sacral spinal cord are essential for maintenance of continence and normal urinary function. The commonest cause of bladder dysfunction in multiple sclerosis is therefore disease of the spinal cord, and the two major consequences are detrusor hyperreflexia and incomplete bladder emptying. Around 2% of patients present with bladder dysfunction as the sole feature [18] although it is part of the presenting symptom complex in a greater proportion, and up to 90% [1] of individuals develop symptoms at some stage in the illness. The results of this population-based study indicate that it is often a major source of morbidity.

Of 221 patients 181 (82%) either had symptoms of bladder dysfunction or used a catheter. The commonest clinical manifestation of dysfunction was loss of descending inhibition producing frequency, urgency and urge incontinence and this was also reflected in the urodynamic evaluation of 152 patients in whom detrusor hyperreflexia was the most frequent finding. Indeed, when those patients are included who experience abnormal frequency (> 5 times/day) but are not necessarily symptomatic, the proportion of all patients with bladder dysfunction rises to 175 of 221 (79%). Other studies have generally reported a lower incidence of frequency with urgency tending to be the more common problem (see Table 5), but in our study the incidence of frequency (76%) and urgency (71%) were comparable. A common concurrent problem is hesitancy, which suggests that much of the prevalent bladder dysfunction in multiple sclerosis is complex and involves a number of pathways. The lower than expected frequency of urge incontinence undoubtedly reflects the population-based recruitment by comparison with cohorts identified on the basis of current symptoms which form the majority of published surveys. Evaluation of these common symptoms in routine clinical practice often allows the clinician to assess the suitability of prescribing anticholinergics which are effective in detrusor hyperreflexia. However, the presence of incomplete bladder emptying should prompt the identification of patients with high residual volumes in whom these drugs are ineffective when used in isolation.

It has been suggested previously that the risk of patients with bladder dysfunction going on to develop significant upper urinary tract abnormalities is high, and in one study of mortality in multiple sclerosis the cause of death was attributable to urological causes in 60% [26]. More contemporary analyses suggest that both death and serious upper tract complications from bladder dysfunction are rare [20, 23]. Betts et al. [3] analysed 56 of 170 patients with bladder dysfunction who had intravenous urograms and found only two with abnormalities; both were men with long-standing severe disease who had hydroureters and hydronephrosis. Results from this study are biased by the fact that upper urinary tract investigations were performed only where indicated; however, the incidence of abnormalities (20%) was higher than expected, as was the biochemical evidence of renal impairment reflected by abnormally high urea (9%) or creatinine (3%).

In contrast to the urogenital tract, bowel symptoms in multiple sclerosis have received scant attention. In an analysis of 297 patients Miller et al. [18] reported constipation in 39%, although they comment that this was difficult to interpret since constipation was very prevalent in the community, and nearly half of their symptomatic patients had always been constipated. A further 10% reported urgency of defecation, although no comment was made on faecal incontinence. A large survey by Kraft et al. [15] noted bowel symptoms in 39% of patients with multiple sclerosis, although details are lacking, and more recently in a study of 77 consecutive patients attending a neurourology clinic [8] 36% had constipation, 20% had current faecal incontinence, and 29% had experienced at least one episode of incontinence. Perhaps the most informative study on the prevalence of bowel dysfunction in multiple sclerosis was by Hinds et al. [13] who analysed data from 280 postal questionnaires sent to every fourth person on a local Multiple Sclerosis Society mailing list. Constipation was present in 43% and correlated with disease duration and severity; faecal incontinence had occurred in 51% of patients in the past 3 months and once per week or more in 25% of patients followed up with a more detailed questionnaire. These figures may not be entirely comparable with the results of our study since members of the Multiple Sclerosis Society returning questionnaires are not necessarily representative of the general population with multiple sclerosis. However, the frequency of faecal incontinence in both studies remains high (51% and 29%) and is not well reflected by changes in examination of anal tone or reflexes, representing what is almost certainly a poorly addressed issue in the clinic.

Changes in sexual function are common in multiple sclerosis affecting 38% of patients in a population-based survey in Olmstead County, Minnesota. [24] Almost all patients in advanced phases of the disease are symptomatic [17] [19] although even in mild cases difficulties are not unusual and indeed may be reported more by women with lower EDSS scores [14]. In a study of sexual function in 47 women with advanced disease [14] the commonest symptoms were decreased sexual desire (60%), sensory changes (62%) and reduced orgasmic capacity (38%). The presence of symptoms was correlated with bladder and bowel dysfunction, but also with ataxia and vertigo. In our study fatigue and problems with dexterity also featured highly. The most common complaint among men was erectile failure, although interference with sexual activity due to spasticity and continence were shared by both sexes.

Few studies have attempted to analyse the practical impact of urinary dysfunction in-patients with multiple sclerosis. Social isolation caused by worries about or practical aspects of urinary or faecal incontinence, odour of soiled

clothes, strategic fluid intake and planning activities around the geographical location of lavatories outside the home are all issues which must be addressed for comprehensive management of symptomatic patients with multiple sclerosis. Awareness of such problems by the physician, an understanding of the frequency of bladder, bowel and sexual dysfunction in these patients and the manner in which investigations may aid decisions in management, direct appropriate intervention and have the potential to enhance quality of life for these patients.

References

1. Andersen JT, Bradley WE (1976) Abnormalities of detrusor and sphincter funtion in multiple sclerosis. Br J Urol 48:193–198
2. Awad SA, Gajewski JB, Sogbein SK, Murray TJ, Field CA (1984) Relationship between neurological and urological status in multiple sclerosis. J Urol 132:499–502
3. Betts CD, D'Mellow MT, Fowler CJ (1993) Urinary symptoms and the neurological features of bladder dysfunction in multiple sclerosis. J Neurol Neurosurg Psychiatry 56:245–250
4. Blaivas JG, Holland NJ, Giesser B, LaRocca N, Madonna M, Scheinberg L (1984) Multiple sclerosis bladder. Studies and care. Ann N Y Acad Sci 436:328–346
5. Blaivas JG, Bhimani G, Labib KB (1979) Vesicourethral dysfunction in multiple sclerosis. J Urol 122:342–347
6. Bradley WE, Logothetis JL, Timm GW (1973) Cystometric and sphincter abnormalities in multiple sclerosis. Neurology 23:1131–1139
7. Carter S, D. S, Merrit HH (1950) The course of multiple sclerosis as determined by autopsy proven cases. Res Publ Ass Nerv Ment 28:471–509
8. Chia YW, Fowler CJ, Kamm MA, Henry MM, Lemieux MC, Swash M (1995) Prevalence of bowel dysfunction in patients with multiple sclerosis and bladder dysfunction. J Neurol 242: 105–108
9. Fowler CJ, van Kerrebroeck PEV, Nordenbo A, Van Poppel H (1992) Treatment of lower urinary tract dysfunction in patients with multiple sclerosis. J Neurol Neurosurg Psychiatry 55: 986–989
10. Goldstein I, Siroky MB, Sax S, Krane RJ (1982) Neurourologic abnormalities in multiple sclerosis. J Urol 128:541–545
11. Gonor SE, Carroll DJ, Metcalfe JB (1985) Vesical dysfunction in multiple sclerosis. Urology 25:429–431
12. Hennessey A, Swingler RJ, Compston DAS (1989) The incidence and mortality of multiple sclerosis in south east Wales. J Neurol Neurosurg Psychiatry 52:1085–1089
13. Hinds JP, Benjamin H, Eideman H, Wald A (1990) Prevalence of bowel dysfunction in multiple sclerosis. Gastroenterology 98:1538–1542
14. Hulter BM, Lundberg PO (1995) Sexual function in women with advanced multiple sclerosis. J Neurol Neurosurg Psychiatry 59:83–86
15. Kraft GH, Freal JE, Corvell JK (1986) Disability, disease duration and rehabilitation service needs in multiple sclerosis: patient perspectives. Arch Phys Med Rehabil 67:164–168
16. Langworthy OR (1938) Disturbances of micturition associated with disseminated sclerosis. J Nerv Ment Dis 88:760–770
17. Lilius HG, Valtonen EJ, Wikstrom J (1976) Sexual problems in patients suffering from multiple sclerosis. Scand J Med 4:41–44
18. Miller H, Simpson CA, Yeates WK (1965) Bladder dysfunction in multiple scelrosis. BMJ 1:1265–1269
19. Minderhoud JM, Leemhuis JG, Kremer J, Laban E, Smits PML (1984) Sexual disturbances arising from multiple sclerosis. Acta Neurol Scand 70:299–306
20. Phadke JG (1987) Survival pattern and cause of death in patients with multiple sclerosis: results from an epidemiological survey in north east Scotland. J Neurol Neurosurg Psychiatry 50: 523–531
21. Philp T, Read DJ, Higson RH (1981) The urodynamic characteristics of multiple sclerosis. Br J Urol 53:672–675
22. Poser C, Paty D, Scheinberg L, et al (1983) New diagnostic criteria for multiple sclerosis: guidelines for research protocols. Ann Neurol 13:227–231
23. Poskanzer DC, Schapira K, Miller H (1963) Epidemiology of multiple sclerosis in the Counties of Northumberland and Durham. J Neurol Neurosurg Psychiatry 26:368–376
24. Rodriguez M, Siva A, Ward J, Stolp-Smith K, O'Brien P, Kurland L (1994) Impairment, disability and handicap in multiple sclerosis: a population-based study in Olmstead County, Minnesota. Neurology 44:28–33
25. Sachs B, Freidman ED (1921) The general symptoms of multiple sclerosis and the mode of development of the symptoms of multiple sclerosis. Assoc Res Nerv Ment Dis 2:49–55
26. Samellas W, Rubin B (1965) Management of upper tract complications in multiple sclerosis by means of urinary diversion to an ileal conduit. J Urol 93: 548–552
27. Swingler RJ, Compston DAS (1988) The prevalence of multiple sclerosis in south east Wales. J Neurol Neurosurg Psychiatry 51:1520–2524
28. Szaz G, Paty D, Lawton-Speert S, et al. (1984) A sexual functioning scale in multiple sclerosis. Acta Neurol Scand 70:37–43