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SESSION ONE: THE FEMALE PARAPLEGIC**

SPINAL CORD INJURY IN THE FEMALE

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Summary. A survey of 200 women, admitted with spinal cord injuries over a 20-year-period, revealed that such injuries were much less common in females than males, with a ratio of 1 female to 4.4 males. Women had a higher ratio of cervical injuries, mainly due to elderly ladies falling downstairs at home. Most women (60 per cent) achieved full independence, pressure sores were seldom a problem, and some women were able to return to work in offices and teaching.

Women were very rarely at risk of renal failure. Most complete tetraplegics required permanent catheter drainage, with a 30 per cent incidence of leakage and blockage. Regular cystoscopy was advisable and the danger of autonomic dysreflexia had to be prevented. Partial tetraplegics and most paraplegics could manage without permanent catheters. Most became catheter-free, and the practice of self intermittent catheterisation would be the method of choice for the others.

The causes of death were unremarkable, except that only 17 per cent of all late deaths were attributable to the injury.

Key words: Spinal cord injury; Female patients.

Introduction

TRAUMATIC injury of the spinal cord has always been much less common in the female, than in the male population. The Sheffield Unit opened a female ward in 1961, and during the next 20 years, 1961-81, a total of 200 females were admitted with spinal injuries, mostly within hours of the accident, an average of 10 cases per year. During the same period 880 males were admitted, giving a ratio of one female to 4.4 males. Eighteen per cent of the acute beds were needed for female patients.

Age

A RECORD of the ages of the patients at the time of their accident is given in Table I.

TABLE I
Age at time of accident

Age	< 20	20-40	40-60	60+
Alive	35	69	28	20
Dead	2	5	12	29
Total	37 (18%)	74 (37%)	40 (20%)	49 (25%)

There is a preponderance of patients in the 20-40 age group, compared with other age groups. Actual ages ranged from 3 years to 89 years.

Level

The distribution of cases according to the level of injury is recorded in Table II.

TABLE II
Level of spinal injury

Level	C	D	D/L	L
Alive	72	28	41	11
Dead	38	2	2	1
	110 (55%)	30 (15%)	48 (24%)	12 (6%)

This demonstrates that the majority of injuries were at the cervical level.

Forty per cent of all injuries were complete lesions, while 60 per cent were partial lesions.

Causes

The circumstances responsible for the accidents are recorded in Table III.

TABLE III
Aetiology of spinal injury

Cause	RTA	Falls	Sports	Other and Industrial
Alive	92	44	11	5
Dead	16	30	1	1
Total	108	74	12	6
Percentage	54%	37%	6%	4%
Male				
Percentage	42%	37%	6%	15%

This shows that females have much less risk of industrial injuries than males, with a higher proportion of road accidents.

Analysis of the 74 falls in females showed that 45 (60 per cent) occurred at home, mostly in elderly women falling downstairs at night. In the 29 other falls, 13 were suicide attempts. In sporting injuries, women had more equestrian and fewer swimming accidents than men.

Work

Thirty-four (22 per cent) of the surviving females were able to return to work, mostly in offices (13), and the teaching profession (10). Seven children returned to school. No complete tetraplegic female patient returned to work.

Pressure sores

Eight patients developed pressure ulcers in the 48 patients who died, including one patient who died from that complication.

In the 152 survivors, nine had had pressure ulcers at some time.

Independence

In the 180 patients, who survived the acute stage, 114 (60 per cent) achieved full independence. Sixty patients with tetraplegia and six with paraplegia required assistance, including 13 elderly tetraplegic patients who needed custodial care in a hospital or nursing home.

Urological status

Urinary bladder paralysis was always treated with an indwelling Foley catheter 18 French Gauge, with a 5 ml balloon. Attempts were made to dispense with the catheter about the time of their mobilisation into a wheelchair.

The final bladder state is recorded in Table IV.

TABLE IV
Urological status regarding indwelling catheterisation.

	Catheter		Others
	Yes	No	
Complete Tetra.	24	0	Diversions 4 Self I.C. 7
Partial Tetra.	12	34	
Complete Para.	14	16	
Partial Para.	2	39	

Fifty-two patients required catheters permanently and 89 were catheter-free, including 28 with 'urgent' bladders, 15 with 'straining' bladders, and 45 who regained normal control.

1. Catheter patients

Fifty per cent of all patients with tetraplegia required catheters, mostly those with complete lesions. Twenty per cent of all paraplegics required catheters. Not one complete tetraplegic patient was catheter-free.

Problems with catheters occurred in 17 patients (30 per cent) either due to leakage around the catheter, by-passing the catheter, in 4 cases, or with stone formation causing blockage in 13 cases. Three tetraplegic patients suffered from episodes of autonomic dysreflexia associated with catheter blockage.

Most patients had an annual cystoscopic examination to wash out any debris which had formed. Some patients took anti-spasmodic drugs, Probanthine, Imipramine or Oxybutynin, to reduce reflex activity in the bladder and prevent by-passing of the catheter. A few patients had trans-sacral alcohol blocks performed to reduce excessive detrusor activity.

Cystoscopy could be a dangerous procedure in a patient liable to autonomic dysreflexia, and in some patients it was performed under spinal anaesthesia. Such patients were kept in bed and not allowed home until the following day, as we had an unfortunate death from brain haemorrhage in a woman with a high tetraplegia who was allowed home the same day as her cystoscopy, and who suffered apoplexy in the car on the way home.

2. *Catheter-free patients*

These numbered 89, most had partial lesions, of whom only three were persistently incontinent. Others were wet intermittently at menstruation and with episodes of urinary infection, when antibiotic and anti-spasmodic treatment was needed.

3. *Renal function*

Excretion urography was performed every 2-5 years, and in 99 per cent of cases the renal function was normal.

Only one patient died from renal failure. This woman of 45 years had a partial paraplegia with a straining type of bladder. She developed hydronephrosis 10 years after her injury, but declined the offer of a catheter. She died in another hospital during an acute illness, recorded as renal failure.

During the same period, 19 male patients died from renal failure, either due to pyelonephritis or amyloid disease.

4. *Urinary diversions*

Urinary diversions in the form of ileal loop conduits were performed on four patients, two at Sheffield for social reasons, and two elsewhere. One of the Sheffield conduit patients has renal stones.

Diversions are not held in favour by my urological colleagues, and are not recommended unless everything else fails.

5. *Self-intermittent catheterisation*

This is the preferred method in vogue at present, using anti-spasmodic drugs to reduce reflex detrusor activity, if it is excessive. Such patients carry out the procedure four times daily on the bed, toilet or in a wheelchair, using either a disposable catheter or a silver plated one, kept in antiseptic solution. There is no doubt that most paraplegic patients will be offered a trial of this method in future if they are incontinent.

Deaths

Forty-eight women (24 per cent) have died in our series of 200 cases:
 Twenty died in the acute stage of their injury:
 Fourteen from respiratory or circulatory failure, in patients with high cervical lesions.
 Two from pulmonary embolism.
 Two from fat embolism.
 One each from aneurysm, stroke.
 Twenty-eight died in later years, 1-10 years after injury.
 Thirteen from old age, five from cancer.
 Two each from heart disease, abdominal disease.
 One each from a road traffic accident, anaesthesia, pressure ulcers, drugs.
 One each from renal failure, autonomic dysreflexia.
 Of the 48 deaths, seven were under 40 years, and 41 over 40 years at the time of their accident.

Conclusions

1. Women are much less liable to spinal injury than men.
2. Women have a higher ratio of cervical injuries, mainly due to elderly ladies falling downstairs at home.
3. Sores are only a minor problem in women.
4. Women are only very rarely at risk from renal failure.
5. Catheters are necessary for most women who have complete tetraplegia, but all other injured females should have a trial of self-intermittent catheterisation if they are incontinent.
6. Catheters need to be carefully supervised to prevent complications, especially with regard to autonomic dysreflexia.

RÉSUMÉ

Une enquête sur 200 femmes qui étaient laissées entrer en l'espace de 20 ans révélait que de telles blessures étaient beaucoup moins ordinaires entre des femmes que des hommes dans la proportion d'une femme contre 4.4 d'hommes. Des femmes avaient une proportion plus élevée de blessures cervicales, en grande partie à cause des femmes assez âgées qui étaient tombées l'escalier à la maison. La plupart des femmes (60%) obtenaient l'indépendance complète, des plaies de la pression étaient un problème peu souvent et quelques femmes pouvaient travailler dans les bureaux et dans l'enseignement.

Des femmes avaient très rarement le danger d'une défaillance rénale. La plupart des complètes quadriplégiques avaient besoin de cathéter drainage permanent, avec une fréquence de 30% des fuites et des obstructions. Le cystoscopie régulier était conseillé et le danger de dysreflexia autonome devait être empêché. Des quadriplégiques partiels et la plupart des paraplégiques pouvaient y parvenir faire des cathéters permanents.

La plupart pouvaient se passer de cathéter et la pratique de intermittent cathétérisation personnels serait la méthode de préférence pour des autres.

Les causes de la mort étaient médiocres sauf que 17% des morts tardifs seulement étaient imputable à la blessure.

ZUSAMMENFASSUNG

Statistische Untersuchung von 200 weiblichen Patienten, die in einem Zeitraum von 20 Jahren mit spinalen Lähmungen ins Krankenhaus eingeliefert wurden, zeigte, dass solche

Verletzungen viel weniger oft in Frauen auftreten als in Männern, mit einem Verhältniss von 1 zu 4,4.

Zervikale Verletzungen waren verhältniss mässig häufiger, hauptsächlich da ältere Damen zu Hause die Teppe hinunter fielen. Die meisten Frauen (60%) erreichten volle Unabhängigkeit, Druckgeschwüre waren selten ein Problem und einige der Patientinnen waren im Stand Arbeit im Büro oder als Lehrerin wieder aufzunehmen.

Niereninsuffizienz trat bei den weiblichen Patienten nur selten auf. Wenn totale Tetraplegie vorlag, war meistens ein Dauer-Katheter notwendig; die Häufigkeit von Lecken und Blockierung war 30%. Regelmässige Zystoskopie erwies sich als ratsam und die Gefahr einer autonomschen Dysreflexie musste verhindert werden. Partielle Tetraplegiker und die meisten Paraplegiker waren im Stand ohne Dauerkatheter auszukommen. Die Mehrzahl wurden Katheter-frei, in anderen Fällen schien wiederholte Selbstkatheterisierung die beste Methode.

Die Todesursachen waren nicht von spezieller Bedeutung, doch ist es bemerkenswert, dass späte Todesfälle nur in 17% der Verletzung zuzuschreiben waren.

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