COMPARISON OF SPINAL CORD INJURIES IN FEMALES AND IN MALES, 1979-1981 BASLE

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Summary. The statistics regarding age, marital status, nationality, paraplegic: tetraplegic ratio and causes of accident of the 92 female and 238 male patients in our Centre in the years 1979-1981 show, in comparison to our own previous studies and those of other countries, the worldwide highest female-male rate of 1:2.59. This is usually due to the higher occurrence of traffic accidents for women. The fact that in the age group below 30 years more women than men suffer from spinal cord injuries implies adapting rehabilitation and management to the specific needs of women.

Key words: Spinal cord injuries in female patients; Epidemiological evaluation; Implications for rehabilitation.

Introduction and Methods

THREE HUNDRED AND THIRTY patients suffering from spinal cord injuries were admitted to the Swiss Paraplegic Centre of Basle for treatment and rehabilitation in the period 1979-1981. These patients were analysed epidemiologically according to sex, age, marital status, nationality and aetiology of the accident. The question arose whether the expected differences of the analysed parameters are of such importance as to possibly justify different treatment and rehabilitation procedures according to the sex of the patient.

Interpretation and Discussion of the Results

1. Female-male ratio

Of the 330 patients, 92 were female and 238 male; this represents a female-male ratio of 1:2.59. A previous study in Switzerland (Gehrig and Michaelis, 1968) for the period 1960-1967 showed a ratio of 1:4.96 (Table I). Similar to other countries (England, and Norway), which also have studies dating from different periods, one sees an increase in female spinal cord injuries. Surprisingly, however, one can find greatly varying female-male ratios in different countries at the same time (Fukuoka, Lyon, North California); this could possibly derive from differences in the social, economic and cultural structures.

TABLE I
Female to male ratio of patients with spinal cord injury: various reported injuries

Study	Site	Period	Female-Male Ratio
Frankel <i>et al.</i> (1968)	England	1951-68	8.59
Sutton <i>et al.</i> (1982)	North England	1975-79	4.36
Kassa and McAdam (1967)	Norway	1949-57	6.00
Gjone and Nordlie (1978)	Norway	1974-75	4.95
Gehrig and Michaelis (1968)	Switzerland	1960-67	4.96
This study	Basle	1979-81	2.59
Jousse <i>et al.</i> (1967)	Toronto	1945-66	6.85
Key and Retief (1970)	Cape Province	1963-67	8.38
Kraus <i>et al.</i> (1975)	North California	1970-71	3.70
Sutton (1973)	Brisbane	1962-71	7.07
Tusji and Fujishama (1975)	Fukuoka	1969-74	9.64
Minaire <i>et al.</i> (1978)	Lyon	1970-75	3.70
Fine <i>et al.</i> (1979)	Alabama	1973-77	4.28
Brown (1964)	New Zealand	1957-61	4.83

2. Age

When comparing the age-structure of the whole Swiss population to the age-structure of our 330 patients one can see that morbidity for spinal cord injury is by far the highest in the female age group of under 20 years old, i.e. exactly double the morbidity of the same male age group (Table II).

TABLE II
Age group ratio

3. Marital status

The percentages of single, divorced, separated and widowed women are higher than those of the men. The higher percentage of single women (54.3 per cent women, 45.8 per cent men) is due to the above mentioned higher morbidity of women in the youngest age group (Table III).

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TABLE III
Marital status

	%		%
54.3	Single	45.8

7.6	Divorced/ Separated	2.1

5.4	Widowed	2.1

32.6	Married	50.0

Female

Male

4. Nationality

The morbidity for spinal cord injury is practically identical for Swiss and foreign women. (About 20 per cent of the Swiss population are foreigners.)

5. Paraplegic:tetraplegic ratio

With regard to the level of spinal cord injury there is a remarkably higher percentage of female paraplegics than in the male group (Table IV).

TABLE IV
Paraplegics—tetraplegics ratio

6. Cause of injury

The differences in percentage of the traffic, work accidents and suicide attempts are also remarkable (Table V).

TABLE V
Causes of accident (overall)

	%		%	
	48.9	Traffic	33.2	
	8.7	Work	33.2	
	16.3	Sports	15.6	
	9.8	Suicides	2.6	
	16.3	Other	15.6	
Female				Male

Concerning road accidents there is a very high percentage of injured females both as car passengers as well as motorcycle passengers as compared with male passengers (car passengers 44.4 per cent to 25.3 per cent, motorcycle passengers 11.1 per cent to 1.3 per cent; Table VI).

TABLE VI
Traffic accidents

	%		%	
		Car:		
	22.2	— Driver	20.3	
	44.4	— Passenger	25.3	
		Motorcycles:		
	2.2	— Driver	30.4	
	11.1	— Passenger	1.3	
	8.8	Bicycle/ Motorbicycle	13.9	
	8.8	Pedestrian	1.3	
	2.2	Other Traffic	1.3	
Female				Male

As can be expected, more men have severe accidents at work than do women; more women, however, fall from cherry trees during the cherry picking season (Table VII).

The number of sports which lead to spinal cord lesions is clearly smaller

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TABLE VII
Accidents at work

%			%	
Falling From				
Female	62.5	Trees	12.7	Male
	0	Buildings	20.3	
	12.5	Other	29.1	
	25	Other Work Accident	38	

for women than for men (4 to 8). Relatively more women than men, however, are injured when skiing or riding (Table VIII).

TABLE VIII
Accidents due to sport

%			%	
Female	60	Skiing	27.1	Male
	20	Riding	8.1	
	6	Diving	0	
	0	Other Water Sports	16.2	
	0	Gymnastics	8.1	
	0	Trampoline	5.4	
	0	Mountaineer	8.1	
	0	Deltagliding	2.7	
	14	Other Sports	24.3	

Conclusions

In Switzerland there is a steady increase in the number of women with spinal cord lesions (Gehrig and Michaelis, 1968; Jenik *et al.*, 1982; Zäch, 1977-82). Compared with other countries we have the highest female-male ratio of 1:2.59 for the period 1979-1981.

The fact that 55.4 per cent of paraplegic and tetraplegic women are under 30 years old is due to the big increase in road accidents in which females are to a great extent involved as passengers.

A similar higher percentage of younger females is to be found in the female marital status; two-thirds of the female patients as opposed to one half of the male patients are unmarried, a fact which poses more problems for the re-integration of women than of men, (higher demands of self reliance or more dependance on help from outside the family).

The liability of spinal cord injury due to accidents at work is smaller for women than for men (8.7 per cent to 33.2 per cent). The percentage of falls from cherry trees among the female work accidents is, however, remarkably high in spite of all warnings given out every year in the cherry season.

In Switzerland there are now more deaths due to suicide than to road accidents. Female suicide attempts of appellatory nature constitute 10 per cent of all accidents with spinal cord injuries. Understandably such patients must be looked after with special psychological care.

The steady increase of the number of women with spinal cord injuries implies more attention to specifically feminine problems in urological management and in social and vocational reintegration.

RÉSUMÉ

L'analyse statistique (âge, état civil, nationalité, relation paraplégiques/tétraplégiques et causes d'accidents) des 92 femmes et 238 hommes hospitalisés dans notre centre pendant les années 1979-81 montre par rapport à nos propres travaux et à ceux d'autres auteurs un accroissement continu du nombre de femmes paralysées avec un facteur de 1:2,59. Cette augmentation est surtout due à une incidence plus élevée des accidents de trafic. Le pourcentage élevé (55,4%) des femmes de moins de 30 ans frappe en comparaison avec celui des patients masculins. Ceci implique une orientation accrue vers les problèmes spécifiquement féminins telqu'un management urologique adéquat ainsi que des efforts de réintégration au plan professionnel et social de ces jeunes femmes qui de nos jours sont pratiquement indépendantes.

ZUSAMMENFASSUNG

Die statistische Analyse (Alter, Zivilstand, Nationalität, Verhältnis Paraplegiker/Tetraplegiker und Unfallursachen) der 92 weiblichen und 238 männlichen Patienten unseres Zentrums der Jahre 1979-81 zeigt verglichen mit eigenen und anderen Untersuchungen eine kontinuierliche Zunahme der querschnittgelähmten Frauen mit dem weltweit höchsten Faktor von 1:2,59. Der Hauptanteil dieses Anstiegs liegt in der erhöhten Inzidenz für Verkehrsunfälle. Gegenüber den männlichen Patienten ist der hohe Anteil (55,4%) der unter 30-jährigen Patientinnen auffallend, was eine vermehrte Orientierung hinsichtlich spezifisch weiblicher Probleme dieser Patientengruppe impliziert, wie vorallem adäquates urologisches Management, Reintegrationsbemühungen auf beruflicher und sozialer Ebene der heute weitgehend selbständigen jungen Frau.

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