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LEISURE TIME PHYSICAL ACTIVITIES AND THE RESULTS OF SURGERY OF LUMBAR DISC HERNIATION

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ABSTRACT. The aim of this study was to elucidate the consequences of leisure time physical activities on the one-year results of surgery of lumbar intervertebral disc herniation. Pre- and postoperative leisure time physical activities and severity of occupation handicap were analyzed from 212 patients. Only to a certain degree the findings support the claim that a high preoperative level of physical activities during leisure time is linked with good postoperative results.

Key words: intervertebral disc displacement, leisure time, lumbar region, physical activity, prognosis, surgery

Studies from many industrialized countries reveal an increasing incidence and prevalence of low back pain (2, 5). A physically active life style is generally recommended to prevent low back pain (10, 11). Some scientific reports of prospective studies support the above recommendations (3, 7, 14, 15, 17, 18). For example, in a prospective study of 1 652 firefighters Cady et al. (3) demonstrated that an increasing level of fitness gives a graded and significant protective effect against low back pain. However, the relations of leisure time physical activities and low back pain are not always clear (4, 12, 20).

The present study was a part of a larger prospective project of the Rehabilitation Research Centre of the Social Insurance Institution, the Turku University Central Hospital and the Turku City Hospital. The aim of the whole project was to examine the rehabilitation process with one-year follow-up of patients operated on for lumbar disc herniation (1, 6). The study was carried out between May 1980 and October 1983. The particular purpose of this report was to elucidate the consequences of leisure time physical activities on the result of surgery for lumbar intervertebral disc herniation.

MATERIAL AND METHODS

The patients selected had had no previous spinal surgery, were under 55 years of age, had not yet retired and resided within the district of the Turku University Central Hospital. A total of 220 consecutive patients fulfilled the above criteria and were operated on for lumbar disc herniation. The operative finding was extrusion in 17%, prolapse in 65% and protrusion of the intervertebral disc in 16% of the 220 cases. Eight of the cases failed to attend the one-year postoperative evaluation. The final study group of 212 patients (mean age 39.3 yrs, range 16–54) included 101 females and 111 males.

The team of a physiatrist, surgeon, social worker and a psychologist evaluated each patient's occupation handicap using the modified WHO scales (1, 19).

The preoperative handicap was estimated according to the medical history of patients based on both an interview and medical records. It was estimated for the time preceding the acute sciatica attack leading to operation. On the average, the acute preoperative sciatica period had lasted for three months. The postoperative handicap was defined according to a clinical examination and the interviews. It was defined for the period of one year after surgery.

Pre- and postoperatively the patients completed a questionnaire concerning, among other things, their leisure time physical activities. The activities were graded in three classes: 1) low: passive in leisure time physical activities; 2) moderate: no regular hobby of leisure time physical activities but otherwise physically active: gardening, picking berries, repairing furniture, hunting, etc. and 3) high: regular hobby of leisure time physical activities: jogging, dancing, cycling, skiing, swimming etc.

Questions on preoperative leisure time physical activities were concerned with the time preceding the acute sciatica attack leading to operation. Postoperative leisure time physical activities were inquired about one year after surgery.

RESULTS

Table I shows the results of all patients (n=212) operated on for lumbar disc herniation, expressed as changes in the severity of pre- and postoperative occupation handicap.

The preoperative leisure time physical activities were low in 19%, moderate in 57% and high in 24%. The corresponding postoperative rates were 28% low, 53% moderate and 19% high activity.

For further analysis the occupation handicap was

Table I. *The results of all patients (N=212) operated on for lumbar disc herniation expressed as changes in the severity of occupation handicap (%)*

Severity of occupation handicap							
Before the acute sciatica attack leading to operation	One year after operation						
	Total	No	Mild	Moderate	Severe	Very severe	Extr. severe
No	41 (19)	24	14	3	–	–	–
Mild	96 (45)	16	58	14	5	3	–
Moderate	67 (32)	8	29	15	9	6	–
Severe	7 (3)	–	–	2	3	1	1
Very severe	1 (0)	–	–	–	–	1	–
Total	212 (100)	48 (23)	101 (48)	34 (16)	17 (8)	11 (5)	1 (0)

dichotomized: fairly good ones with no or mild handicap and poor patients with moderate-to-severe handicap. The preoperatively good patients with good postoperative results showed no significant correlation to preoperative leisure time physical activities ($\chi^2(2)=0.78$, NS) (Table II). The preoperatively poor patients with good postoperative results showed a significant correlation to preoperative leisure time physical activities ($\chi^2(2)=9.22$, $p=0.01$) (Table II).

The preoperatively good patients with good postoperative results showed no significant correlation between changes of leisure time physical activities before the acute sciatica attack leading to operation and one year after the operation ($\chi^2(3)=3.15$, NS) (Table III). The preoperatively poor patients with good postoperative results showed a significant correlation between changes of leisure time physical activities before the acute sciatica leading to operation and one year after operation ($\chi^2(3)=10.05$, $p=0.02$) (Table III).

The relations of sex, age and other background factors were considered for analysis, but because of very small subgroups such analyses were omitted.

DISCUSSION

A high level of physical activity at leisure has been stated to be a beneficial rehabilitation factor for low back pain patients. Weber (18) found that the patients with high preoperative level of leisure time physical activities have a good prognosis after laminectomy. Spengler (15) has also reported on the good recovery of sportsmen after laminectomy.

The connections between low back pain and physical activities seem to be complicated. The preopera-

Table II. *Preoperative leisure time physical activities and severity of occupation handicap before and after surgery for lumbar disc herniation*

Severity of occupation handicap				
Before the acute sciatica attack leading to oper.	One year after oper.	Level of leisure time physical activities before the acute sciatica attack leading to operation[a]		
		Low	Moderate	High
None-to-mild → (n=137)	None-to-mild (n=112)	76% (19/25)	82% (60/73)	85% (33/39)
			$\chi^2(2)=0.78$, NS	
Moderate-to-severe → (n=74)	None-to-mild (n=37)	20% (3/15)	63% (30/48)	36% (4/11)
			$\chi^2(2)=9.22$, $p=0.01$	

[a] One missing datum.

Table III. *Leisure time physical activities and severity of occupation handicap before and after surgery for lumbar disc herniation*

Severity of occupation handicap		Level changes of leisure time physical activities before the acute sciatica attack leading to operation and one year postoperatively[a]			
		Decreased	No change		Increased
Before the acute sciatica attack leading to oper.	One year after oper.	Mod.→low High→low High→mod.	Low→low	Mod.→mod. High→high	Low→mod. Low→high Mod.→high
None-to-mild → (n=134)	None-to-mild (n=109)	72% (21/29)	79% (11/14)	86% (64/74)	76% (13/17)
			$\chi^2(3)=3.15$, NS		
Moderate-to-severe → (n=74)	None-to-mild (n=37)	43% (10/23)	18% (2/11)	70% (21/30)	40% (4/10)
			$\chi^2(3)=10.05$, $p=0.02$		

[a] Four missing data.

tive physical activity during leisure time did not differ between our operated patients and the Finnish population in general (6). Dehlin et al. (4) gave no evidence of general physical training of nursing aides reducing their low back symptoms. Videman et al. (20) found no correlation between the frequency of leisure time physical activities and low back pain of nurses.

The claim of high preoperative level of leisure time physical activities being linked with good postoperative prognosis is only partly supported by our findings. Low activity does not preclude good results for those with poor preoperative handicap. For a better prognosis, higher than low level of leisure time activities are needed but the moderate level should not be exceeded. Excessive activity may lead to as poor a prognosis as too low an activity for low back pain patients.

Relevant levels of physical activities for low back pain patients need better standards for measuring the level of activity. The conventional frequency and intensity methods to define suitable physical activities for the benefit of the cardiorespiratory system are not adequate for making progress in musculoskeletal functions. More exact information is also needed about the most favorable and atraumatic motions and movements of the musculoskeletal systems. A favorable and atraumatic effect of physical activity should mean optimal spinal stability and mobility, sufficient bone density, adequate muscular strength, soft-tissue elasticity and neuromuscular coordination (8, 9, 16).

For the health and well-being of their backs people must lead a physically active life, train the back moderately and learn to know both the upper and lower multidimensional limits of their own physical activity (15, 10).

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