

CERVICOBRACHIAL SYNDROME – WORK AND DISABILITY

L. Krapac¹, A. Krmpotić¹, L. Pavičević¹ and Z. Domljan²

*Institute for Medical Research and Occupational Health University of Zagreb, Zagreb¹ and
Institute for Rheumatic Diseases and Rehabilitation Clinical Hospital Centre, Zagreb², Croatia*

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The subjects in the study were 114 persons receiving a disability pension or referred for disability assessment. They were placed in two groups of 57 persons each, one with marked cervicobrachial syndrome and the other without. The latter group was chosen by the method of equivalent pairs with regard to sex and age. All subjects underwent a clinical examination and a standardized questionnaire was completed. The questionnaire pertained to the state of health, focussing on the amount and type of physical burdening at the workplace and on activities outside the workplace. Sixty-five percent of the subjects were aged from 51 to 60 years. A statistically significant difference was established between earlier occupation and cervicobrachial syndrome. Cervicobrachial syndrome was found in 31.6% of unskilled workers and 12.3% of the controls ($P < 0.05$). A forced body posture during work was recorded in 74% of the subjects with the syndrome and in 50% of the control subjects ($P < 0.05$). Repetitive movements at work were reported by a large number of subjects with cervicobrachial syndrome (71.9:49.1%; $P < 0.05$) who also claimed to strain the arms (84.2:61.4%; $P < 0.05$) and burden the cervical spine (68.5:40.4%; $P < 0.05$) during household activities to a significantly greater extent than the controls. A possible preventive approach to the occurrence and progression of cervicobrachial syndrome is discussed.

Key terms: body posture at work, risk factors, degenerative spinal disease, working ability.

Diseases of the musculo-skeletal system are present to a marked degree in the working population in Croatia. In a random sample of middle-aged subjects every fifth man and every fourth woman are reported to have a disorder or disease of the spine (1-3). Thus, in addition to diseases of the cardiovascular system, rheumatic disorders and diseases are the main reason for disability. In more than 90% of cases spinal disease was the main reason for disability retirement (4-6). The incidence of disorders and diseases of the cervical spine is on the increase, coming immediately after back pain. They are often the cause of work disability, leading to permanent disability (5-8). Their effect on a person's everyday activities is debilitating, even during rest, and they consequently reduce the quality of life (1, 9-12).

SUBJECTS AND METHODS

The 114 subjects in the study were chosen from a group of patients undergoing disability pension assessment due to cervicobrachial syndrome and other diseases. In 57 of those subjects (29 men and 28 women) marked cervicobrachial syndrome (CBS) was diagnosed as the main illness. The control group consisted of 57 persons who had no symptoms of CBS and were selected by means of the method of equivalent pairs with regard to sex and age.

The CBS diagnosis was based on a case history and standardized clinical examination. Apart from the characteristic pain in the lower part of the cervical spine spreading to the arms, diagnostic criteria included hypertonia of the paravertebral musculature and painfully restricted movement of the cervical spine, pain on palpation and axial pressure in the lower segment of the cervical spine. Reduced strength of the hand grip was tested by means of a mechanical dynamometer according to Collins. EMG, X-ray and oscillographic techniques were used as additional CBS diagnostic methods. We also attempted to establish risk factors connected with the workplace and everyday life, such as the type of job, body posture during work, repetitive movements, lifting and carrying of loads, work conditions, domestic activities, hobbies etc. Data were entered into a specially prepared questionnaire. Data analysis was carried out on an Olivetti M28 personal computer. A Quattro programme was used for statistical analysis and for graphic presentation.

RESULTS

The majority of CBS subjects were aged from 51 to 60 years (65%), 32% were aged from 41 to 50 and only 3% were younger than 41 years. Figure 1 gives their total years of work; the slight difference between them and the control group was not significant.

With regard to current occupation, pensioners were the most numerous in both groups (the CBS group: 59%, the control group: 47.4%). However, among CBS subjects as many

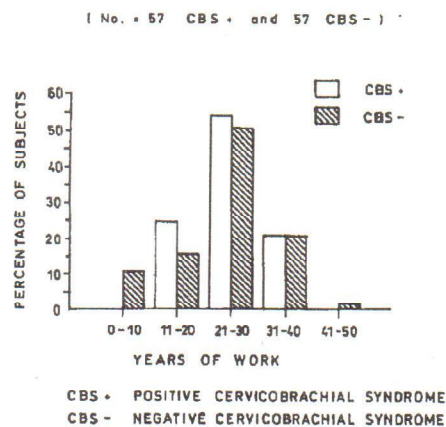


Figure 1. Total years of work of subjects

as 31.6% were unskilled workers, against only 12.3% in the control group ($P < 0.05$). Skilled and highly skilled workers with CBS amounted to only 7%, as opposed to 15.8% of subjects without CBS. With regard to the body posture at work differences were significant (Fig. 2). Most CBS subjects worked in a leaning forward position (67%), whereas controls mostly worked upright or leaning forward ($P < 0.05$). Repetitive movements during work were reported by 71.9% of the CBS subjects and by 49.1% of the controls ($P < 0.05$).

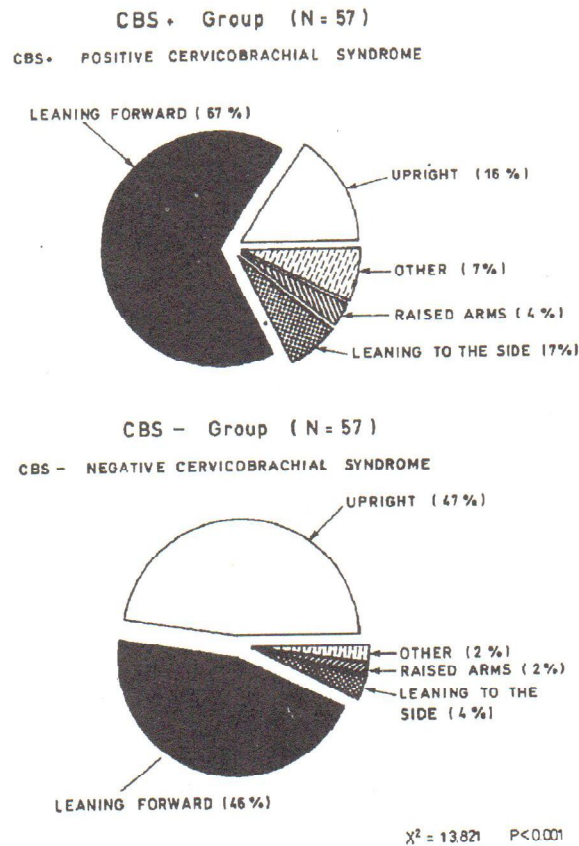


Figure 2. Body posture at work

The subjects' physical activities at work, conditions at the workplace, as well as hobbies are shown in the Table. The symptom most often reported by both groups was »lifting and carrying of loads« (54%). The number of subjects with sedentary jobs was slightly higher in the control group, and of those who lifted or threw loads in the CBS group (10.5:6.9%). However, even these differences did not reach the level of statistical significance. Loads heavier than five kilograms were not lifted at work by 26.3% of the CBS

Table
Subjects by physical activity at work, conditions at the workplace and hobby (n=114)

		Subjects	
		CBS + (n=57)	CBS – (n=57)
Physical activity at work	Sit, without loading	20	22
	Lift or throw loads	6	4
	Lift and carry loads	31	31
		$\bar{X} = 0.495$	P > 0.05 Not significant
Conditions at the workplace	Work outdoors	15	9
	Indoors – suitable microclimate (warm and dry)	17	26
	Indoors – unsuitable microclimate (cold and damp)	25	22
		$\bar{X} = 3.575$	P > 0.05 Not significant
Hobby	Active (agriculture, gardening, sport, hunting)	5	21
	Passive (handicrafts, intellectual work)	14	6
	No hobby	38	30
		$\bar{X} = 13.987$	P < 0.001 Significant

subjects and by 38.6% of the controls. Such loads were lifted for 5–8 hours by 24.6% of the former and 12.3% of the latter subjects. The differences, however, were not significant.

No significant differences were observed with regard to conditions at the workplace either. A total of 47.4% of the CBS subjects and 45.6% of control subjects were not exposed to noxious factors in the working environment. The respective percentages of those exposed to mild injuries were 29.8% and 22.8%, while a small number of subjects were exposed to more serious injuries, vibration and noise.

During housework 64.9% of the CBS subjects were exposed to occasional burdening of the arms, and 19.3% to frequent burdening of the arms. Respective percentages for the control group were 42.1 and 19.3% (P < 0.05). The proportional relation for burdening the cervical spine was 14.0:7.1%; the differences were statistically significant (P < 0.05).

Among the CBS subjects 66.7% had no hobby at all, neither did 52.6% of the control subjects.

The control subjects who tended to spend their free time actively outnumbered the CBS subjects, who predominantly spent their free time passively. These differences were statistically significant (P < 0.001).

DISCUSSION

In medical literature risk factors at the workplace constitute a topical and much discussed issue (12–15). Apart from inherited and constitutional factors, age, sex and methods of work can significantly influence the occurrence and development of CBS. The following

factors are particularly important: forced body posture, repetitive movements, microtrauma, vibration, incorrect loading, detrimental microclimate. In addition, socio-economic factors should not be ignored, such as the type of nutrition, spending of free time and the ever increasing incidence of trauma (7, 16–20). Recently, emphasis has been placed on psychogenic factors which can also play a major role in the occurrence, and particularly in the deterioration of CBS (10, 12, 21, 22).

During 1981–1982, of the total number of persons examined by disability commissions in Croatia 24% applied because of a disease of the locomotor system. These diseases are the largest group of chronic diseases. The most numerous are degenerative diseases of the locomotor system, the spine in particular (4–6).

Among many endogenous and exogenous aetiopathogenetic factors relevant for the occurrence and development of rheumatic diseases and CBS, occupation, physical exertion and working environment are given various significance (9, 12). Patients tend to exaggerate their unsatisfactory effect while physicians are inclined to underestimate them.

Both the CBS and control subjects showed statistically significant differences in respect to occupation ($P < 0.05$). The CBS subjects had more unskilled workers than the controls (31.6:12.3%). Comparable percentages – 30:21.4% have been reported by other authors (23,10). A high percentage of our subjects worked in a forced body position: 74% leaned forward or to the side. In the control group they were significantly fewer – 50% ($P < 0.05$).

In literature forced body posture at work is dealt with as an important aetiopathogenetic factor in the occurrence and development of CBS (7–9, 11). Symptoms of degenerative changes in the cervical spine are reported to be more frequent in typists, precision mechanics, dentists and technical drawers (9).

Apart from a forced position of the body, repeated identical stereotype movements during work are claimed to be an important factor in the occurrence of CBS (up to 80% of the examined subjects and as many as 50% of the subjects in the comparative groups, were said to repeat the same movement during work (24). In our sample there was also a significant difference between the two groups of subjects in that respect. As many as 71.9% of the subjects with confirmed CBS and 49.1% of control subjects performed jobs involving repetitive movements ($P < 0.05$).

Our results along with those of many other authors indicate a significant difference between persons with CBS and control subjects in relation to physical loading during work. This is especially valid for women (7–9, 14).

In our investigation we did not find a statistically significant difference between subjects with CBS and the controls with regard to the lifting of loads heavier than five kilograms. It is difficult to explain the difference between our results and those of some earlier works. One of the reasons could be that our subjects were not separated by sex, and the difference in other investigations was more marked in women than in men (10, 14, 20, 23, 24). In addition we determined that persons with CBS frequently changed their workplace, either on their own initiative or even on the request of the disability commission. Thus, in accordance with their state of health, it could be assumed that their new workplaces did not require physical exertion. Moreover, our data on loading and estimation of the weight of loads were obtained on the basis of subjects' statements, which could have easily deviated from the actually valid.

Other important factors in the occurrence of CBS are macrotraumas and microtraumas (20), microclimate (particularly work in the cold and damp) and vibration (9, 10). These are provocative factors which very frequently lead to clinical manifestation of degenerative diseases of the spine and joints (20, 23).

In our investigation we did not succeed in establishing the effect of microclimate in the workplace on the occurrence and development of CBS. However, it should be mentioned that in our case extremely unfavourable conditions were rare, and accordingly the possibility of their influencing the occurrence and deterioration of CBS cannot be excluded.

Apart from activity at work, people also engage in various activities in their homes which burden certain parts of the body. This can also produce an undesirable health effect and contribute to the occurrence and development of CBS. The female worker often does not distinguish between housework and work at the workplace, which can partly be explained by the higher rate of CBS (24). In our study 84.2% of the CBS subjects burdened their arms during housework and 68.5% encumbered the cervical spine. In the control group the respective percentages were significantly lower (64.4 and 40.4%) and the difference between the CBS and control subjects was statistically significant ($P < 0.05$). It was also observed that significantly more women with CBS reported a marked activity of the cervical spine (14, 15, 25).

CONCLUSION

From the results of our investigation it can be concluded that the occurrence and development of CBS are influenced by occupational factors, particularly the mode of work, physical strain and working environment. Reduced physical condition, partly the result of passive spending of free time is also of consequence, as are workplace conditions which should be adjusted to the worker's anthropometric demands. Attempts should be made to reduce the effect of detrimental agents in the general and working environments (improvement of microclimate, avoidance of repeated monotonous movements by introducing automation and robots, reduction of manual carrying of heavy loads to the minimum). Unfortunately, primary prevention of CBS is difficult to realize. It is therefore necessary to recognize CBS early and to prevent or slow down further deterioration (secondary prevention). Education of the working population and medical staff should be directed to the early recognition of symptoms of diseases and self-protective measures should be initiated.

Attempts will have to be made to improve physical condition, productiveness and quality of life by medical programming of active holidays, prophylactic kineziotherapeutic measures at the workplace, and by encouraging the population to plan more active recreation.

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Sažetak

CERVIKOBRAHIJALNI SINDROM – RAD I RADNA NESPOSOBNOST

Istraživanjem je obuhvaćeno 114 ispitanika koji su odabrani iz skupine invalidskih umirovljenika te bolesnika koji su bili na zdravstvenoj obradi za utvrđivanje invalidnosti. Ispitivanu je skupinu činilo 57 invalidskih umirovljenika s jasno izraženim cervikobrahijalnim sindromom. Poredbena skupina, formirana metodom ekvivalentnih parova s obzirom na spol i dob, bili su bolesnici kojima se ovaj sindrom sa sigurnošću mogao isključiti. Za sve je ispitanike uz klinički pregled ispunjen i standardizirani upitnik u kojem su uz podatke o zdravstvenom stanju bila pitanja o opterećenjima na radnom mjestu, kao i aktivnostima izvan rada. Većina ispitanika (65%) bila je u dobi između 51 i 60 godina. Utvrđena je statistički značajna razlika u zastupanosti cervikobrahijalnog sindroma s obzirom na ranije zanimanje. U ispitivanoj skupini nekvalificirani radnici bili su zastupani s 31,6%, a u poredbenoj s 12,3% ($P < 0,05$). Prisilan položaj tijela pri radu zabilježen je u 74% ispitanika s cervikobrahijalnim sindromom te u 50% ispitanika bez ijednog simptoma ovog sindroma ($P < 0,05$). Jednake pokrete pri radu također je navodio veći broj ispitanika s cervikobrahijalnim sindromom

(79,1:49,1%; $P < 0,05$). Ispitanici s cervikobrahijalnim sindromom su u nešto većem postotku radili u nepovoljnim mikroklimatskim uvjetima, ali razlike s obzirom na poredbenu skupinu nisu bile statistički značajne. U kućanskim aktivnostima znatno su više naprezali ruke (84,2:61,4%; $P < 0,05$) i opterećivali vratnu kralješnicu (68,5:40,4%; $P < 0,05$). U članku se raspravlja i o mogućem preventivnom pristupu nastanku i pogoršanju cervikobrahijalnog sindroma.

Institut za medicinska istraživanja i medicinu rada Sveučilišta u Zagrebu, Zagreb i Zavod za reumatske bolesti i rehabilitaciju Kliničkog bolničkog centra, Zagreb, Hrvatska

Ključne riječi: degenerativna bolest kralježnice, faktori rizika, položaj tijela pri radu, radna sposobnost.