PSYCHOLOGICAL CONSEQUENCES OF THE WORK-RELATED OVERUSE OF THE SPINAL COLUMN ON THE QUALITY OF LIFE

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Abstract: *The increasing complexity of work tasks led to the growth of the number of work-related musculoskeletal diseases (WMSDs), so that scientific research increased too, including Romania. The aim of the study was to investigate the impact of the work-related spinal overuse on the psycho-emotional area and the influences on the employees' quality of life. Material and methods: the study group was made up of working subjects with professional exposure to overuse of the spinal column compared to a control group, both evaluated for pain, anxiety, stress and quality of life. Results were significant statistically increased for pin, anxiety and stress in the working group and we found significant correlations between symptoms and diminished quality of life. Conclusions: there is a negative impact of work related spinal pain on psycho-emotional area, including quality of life. The impact is different according to the anatomical region of pain. Further medical and ergonomic protective measurements need to be taken.*

Rezumat: *Complexitatea crescândă a muncii a dus la creşterea numărului de cazuri de patologie musculo-osteo-articulară prin suprasolicitare profesională, suscitând interes pentru cercetare în lume, dar şi în România. Obiectivele studiului nostru au constat în cercetarea impactului suprasolicitărilor coloanei vertebrale în timpul activităţii profesionale asupra sferei psiho-emoţionale, precum şi corelaţiile cu calitatea vieţii. Material şi metodă: Un lot de populaţie lucrătoare, expusă suprasolicitărilor ocupaţionale ale coloanei vertebrale comparativ cu un lot de control, evaluate pentru durere, anxietate, stres autopercput şi calitatea vieţii. Rezultate: S-au obţinut valori crescute semnificativ statistic ale durerii, anxietăţii şi stresului autoperceput în lotul de studiu, faţă de cel de control, precum şi corelaţii sugestive între existenţa acestor simptome şi diminuarea calităţii vieţii. Concluzii: Există un impact negativ al durerii de coloană vertebrală survenită prin suprasolicitare ocupaţională asupra sferei psiho-emoţionale şi calităţii vieţii, în relaţie cu regiunea anatomo-topografică expusă. Ca urmare se impun măsuri profilactice medicale şi tehnico-organizatorice.*

INTRODUCTION

Increasing variety and continuous transformation of human activities have led to a rise throughout the world in the number of cases of osteo-articular musculoskeletal pathology by occupational strain, requiring the complete study of all the consequences in order to establish ways of therapeutic action and especially prophylaxis. The steps taken so far in Romania suggest the usefulness and the need to deepen the existing knowledge to properly assess the occupational risk and effectively prevent the consequences.

OBJECTIVES

The study objectives were: identification and objectification of some consequences of the muscular and osteoarticular overuse on the subjects exposed to various professions, the study of the impact of these changes on the quality of life of the exposed and the identification of possible correlations between the quality of life and the studied psycho-emotional parameters.

METHODS

There were 230 subjects in the study, who were divided into two groups. The clinical batch included 115 subjects aged between 24 and 40 years old, all of whom were employed in various establishments and / or services of Bihor County. Of these, 39 are CNC machine operators, quality controllers 34, 21 commercial workers in stores (also called sales assistants, sales advisors, cashiers, salespeople, all having the characteristic that they do not operate via the internet, online shops, or in call centres, but in classic stores), 15 pharmacists, six merchandisers.

As a result of overwork, all of them have constant daily overuse of the spine, several hours a day, through: prolonged standing, bending movements, repeated flexion, inability to sit down, or do a few steps, when they feel the need to do this, or more often than is provided in their job description or in the internal regulation. The control group comprised 115 subjects aged between 23 and 42 years old, without WMSDs overuse of occupational or non-occupational type (academic staff, administrative officials with computer or office limited activity, companies administrators).

The inclusion criteria include the age over 18 years old, seniority in the profession and to the same job more of equal to 1 year, subjects working in one shift without overtime, subjects who complained about mechanical pain, the possibility of revaluation if necessary, compliance to the principles of medical ethics.

Exclusion criteria: coexistence of serious illness,

disability, age below 18 years old, non-compliant workers, subjects who complain about inflammatory pain, subjects operated for herniated disc or other spine surgery, mental illness.

The two groups were examined clinically and functionally focusing on the types of musculo-osteo-articular conditions and on the possible effects with a detailed description of symptoms when present.

The following working instruments were used: VAS visual analogue scale for pain, Levenstein stress perception scale Hamilton Anxiety Scale, the questionnaire for assessing the quality of life of the MOS SF-36.

The VAS visual analogue scale is one of the tools most commonly used for the self-assessment of perceived pain, for it is easy to use by the subject, as well as for its reliability and validity proven over the time. It consists of a 10 cm scale, on which suggestive figures for pain intensity are recorded, the subject choosing the value corresponding to the intensity of pain that he/she feels.

Levenstein stress perception scale comprises 30 statements to which subjects can respond using a Likert scale in four gradations. The 30 statements describing possible psychological reactions to various requests that exceed the response capabilities of the person to stress, so measuring the level of self-perceived stress. The score of the subject is between 30 and 120 and allows its classification into the following groups as follows: 30 to 60 - reduced stress; 61-90 - moderate stress; 91-120 - intense stress.

Hamilton Anxiety Scale assesses the global psychiatric symptoms (anxious mood, mental tension) and somatic anxiety. It contains 14 items which determine both global anxiety score and detailed score for "mental anxiety" and "somatic anxiety". The 14 items are quoted on scale of 0-4, based on the presence and intensity of subjective symptoms. Seven of the items addressed mental anxiety and seven items are for somatic anxiety. The individual used in the form of interview without time limit. As the quotation - each item is quoted at between 0-4, where 0 = no anxiety, anxiety 1 = mild, 2 = moderate anxiety, 3 = severe anxiety, 4 = very severe and disabling anxiety. The total score is obtained by summing the scores of the 14 items of the scale, which is between 0 - 56 A score of over 20 is found in individuals diagnosed with anxiety disorders clinic intensity.(3)

The SF-36 is the tool for the investigation of quality of life. It consists of 36 questions, grouped into eight most common fields; response time is about 15 minutes and the score is calculated by the software. There are determined percentage values of physical and mental dimension of the subject investigated, considering a good quality of life values close to 100.(4)

In the clinical group, we found by physical examination, that a total of 63 subjects experienced neck pain. We define the subset with neck pain. 52 subjects had predominant lumbar pain, they formed the subgroup with low back pain. 36 subjects were presented simultaneously, both cervical and lumbar pain. They formed subgroup cervical and lumbar pain. For each subset, we selected randomly by 25 subjects, which we compared with each other regarding the following variables: pain, self perceived stress, anxiety, quality of life.

We then studied the correlations established between types of the parameters, investigated psychological and quality of life.

RESULTS

Statistical analysis was performed with SPSS19 package. Descriptive analysis for continuous variables included indicators of centrality - media release - standard deviation and location - maximum value, minimum value. Kolmogorov-Smirnov test was used to test the normal distribution, Student's t test was used for comparison of means for two independent samples if the probability distribution was normal. Pearson correlation coefficient we used correlation analysis.

Following the tests applied have achieved a number of significant results that we have introduced to facilitate comparison in the following table:

Table no. 1. Mean values obtained from questionnaires on clinical group versus control group

	Clinical group	Control group
Subject Number	115	115
Mean value VAS	3,81(a.s.=2,97)	2,30(a.s.=1,68)
Mean value anxiety	13,25(a.s.=1,99)	10,16(a.s.=1,78)
Mean value self-perceived stress	41.93 (9.72)	41.54 (6.11)
Mean value quality of life	78.12 (3.89)	88.49(2.80)

In the table below, we have correlations established from the study:

Table no. 2. Correlations between the study group for pain, anxiety, self perceived stress and quality of life

Correlations	Quality of life		
	N	R	p
Pain (VAS)	115	-.689	.00
Anxiety	115	-.543	.02
Self-perceived stress	115	-.627	.00

From the statistical analysis of the data in the table above, we can see that pain is a parameter which affects the quality of life; there is a negative correlation between the two variables statistically significant (r = .689, p <.05). In the terms of quality of life and anxiety, the above data indicate a negative correlation between the two variables (R = .543, p <.05); as stress correlates negatively with self-perceived quality of life (R = .627, p <.05).

Below, we have summarized the results as average values of the studied parameters in the subgroups studied:

Table no. 3. Average values obtained from the questionnaires applied in the three study subgroups

	Cervical spine pain subgroup	Lumbar spine pain subgroup	Cervico-lumbar spine pain subgroup
Subject Number	25	25	25
Mean value VAS	4.08(2.01)	4.72(1.68)	5,50(1,32)
Mean value anxiety	11,03(1.85)	11,15(1.25)	11,35(2,21)
Mean value self-perceived stress	45,98(1.35)	45,76(1.47)	45,83(2,16)
Mean value quality of life	78,23(1,45)	78,61(2,27)	75,95(1,42)

DISCUSSIONS

Musculoskeletal disorders are widespread in the general population. Prevalence, however, of either the musculo-osteo-articular structures is difficult to estimate, so the lack of a "gold standard" of measurements and the fact that some segments of the population have sparked a greater interest in study, compared to other, which have been ignored.(5)

Our study focused on a sample of working people with musculoskeletal and osteoarticular overload without occupational or chronic pathology installed but rarely with present symptoms of pain in the spine. Painful symptoms had a mean VAS score of 3.81 for the clinical group (I = 2.97) compared with 2.30 (SD = 1.68) in the control group, the difference being statistically significant. In this respect our findings are consistent with results of other studies that relate to

the working population and shows that pain is among the early signs of occupational diseases by overloading.(6)

Our finding that spinal damage (although reversible to some extent to a point) is found to be directly related to occupational factors that trigger is provided by some other studies.(8)

Recent studies on patients with spinal pain with different types of study design identified the presence of significant psychological disorders like distress, anxiety, which suggested that there is a need for psychological investigation.(4,5,6) This was also a reason to investigate in our study the potential associate effect and we focused on stress and anxiety. Following the clinical findings the researchers' interest was also focused to study the emotional impact of working over-load tasks. A lot of research concluded that there is a direct negative correlation between the WRMSDs and the psychological function of the working people.(7,8) In the same way, in our study we found that there is a correlation between pain intensity and the investigated psycho-emotional items: stress and anxiety. Analysing the three groups apli after the anatomical pain location, we found that the group with both cervical and lumbar pain had significant greater values of pain than the other two groups. In the same way the values for anxiety and stress at the group with both cervical and lumbar pain were bigger than at the values of the other two groups. The quality of life, measured with SF-36 form, showed that the values were lower in group with both cervical and lumbar pain compared to the other two groups. Making the correlation between quality of life and psycho-social factors we have identified the presence of significant statistic correlation at all three groups. Similar aspects were identified by Bongers and all. In a study made on psycho-social work-related risks in the perspective of a bio-behavioural intervention.(4)

CONCLUSIONS

The work related upper limb disorders affect a lot of working people, the most frequent symptom being pain. The intensity and the anatomic location can be different, depending on the area most overloaded during specific working tasks. There is a first and important pain impact on the worker, but a psycho-emotional impact as well. Both physical and psychological disorders lead to decrease of quality of life. Because of so many negative possible effects early risk identification and medical and technical management are required.

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