

THERAPEUTIC ASSESSMENT OF THE WORK-RELATED UPPER LIMB DISORDERS

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Abstract: New types of activities imposed by the economic development with variable and diverse degree of physical and psychical strain have led to an increase in the number of work-related musculo-skeletal disorders (WMSDs) and possible psychological impairment that both require adequate and efficient preventive measurements. The aim of the study was to assess the work-related upper limb musculo-skeletal symptoms and their influence on the quality of life. Material and method: The study covered three years; the group of patients included 144 workers with different professions, all with musculo-skeletal exposures on the upper limb, who was divided into three groups according to pain intensity. The patients were evaluated using the VAS scale and the SF-36 form in three stages: initially, after 10 days of therapy and 6 months later. The results showed negative correlations between pain intensity and quality of life. Conclusions: The rehabilitation programme strengthened by kinesiotherapy at the work place was efficient.

Cuvinte cheie: suprasolicitare ocupațională, durere, calitatea vieții, program de recuperare

Rezumat: Noile tipuri de activități impuse de dezvoltarea economică, cu grad variabil și divers de solicitări fizice și psihice, au dus la o explozie a patologiei de suprasolicitare MOA și neuro-psiho-senzorială, ceea ce impune implementarea conduitei profilactice și terapeutice adecvate, ca raporturi: eficiență/timp, necesar/costuri. Obiective: evaluarea suprasolicitărilor MOA ocupaționale ale trenului superior și cuantificarea consecințelor asupra calității vieții. Material și metodă: Studiul s-a desfășurat pe 3 ani, lotul de 144 de lucrători cu diferite profesii, toate cu suprasolicitări MOA pe trenul superior, fiind subîmpărțit în 3 subloturi, în funcție de intensitatea durerii. Lucrătorilor li s-au aplicat scala VAS și chestionarul SF-36, în trei etape; inițial, după 10 zile de terapie de recuperare și la 6 luni. Rezultatele au arătat corelații negative între intensitatea durerii și nivelul calității vieții. Concluzii: programul de recuperare, întărit de kinetoterapia la locul de muncă au fost eficiente.

INTRODUCTION

Worldwide, it is well known that the overuse of musculoskeletal osteo-articular pathology (WMSDs) during work, ranks second in the standings occupational diseases. Socio-economic evolution has led to new types of activities, with a high degree of physical and mental distress. Therefore, the study of prophylactic and therapeutic behaviours adapted to this type of overload, helps identifying those methods that are most suitable as ratios of efficiency / time needed / cost.

PURPOSE

To assess overloading of WMSDs due to professions that typically produce higher distress on the upper limb, the effects on quality of life both professional and non-professional.

METHODS

The study was conducted in the ambulatory of Bihor County during 2010 - 2013 on a sample of 144 workers with different professions, but all with overload WMSDs on the upper body: 35 people who use computers in their daily work, over 80% of working time, 25 people - accountants, administrative officials etc. garment workers: 19 drivers: 16 construction workers, 8 cargo handlers: 6 bakers: six dentists 5 nurses, 5 locksmiths five cashiers, 5 roofers, 4 masseurs, 2 maids, 2 operators parts, 2 fork-lift: 1 storage worker. Inclusion criteria: age over 10 years in the same occupation, adherence to

the protocol required for 6 months uninterrupted professional activity throughout the study. (No sick leave, or job changes). Exclusion criteria: other activities that overwhelm upper body (gardening, driving the car for a long period of time, for personal use), trauma and /or outstanding congenital disabilities or severe debilitating chronic diseases. There was agreement on the principles of participation, privacy and data access according to the current procedures. Evaluation included clinical examination, functional, laboratory investigations and administration of VAS scale and SF-36 questionnaire. Visual analogue scale VAS is a valid and reliable pain assessment tool.(1,2) The SF-36 is a commonly used tool for investigating quality of life, being composed of 36 questions, grouped into eight most common fields. Percentage values of physical size (PCS) and mental (MCS) of the subject investigated are determined, considering a good quality of life values close to 100.(3)

The initial sample was subdivided into three groups: group 1 contains 64 subjects without any anatomical and functional changes, with sporadic complaints, unorganized, of the painful type, and an easy made connection between the conditions of occurrence of pain and occupational distress; batch 2 comprises 43 subjects with functional changes, intermittent pain, slight limitation of motion (ROM) of the upper body, without hindering the professional activity. Group 3 consists of 37 subjects with frequent painful episodes anamnesticly

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correlated with occupational overuse and the nature of working tasks, which is almost invariably associated muscle contracture sometimes numbness, limiting the maximum amplitude of motion (ROM= Range of Motion). Typically, in this group there have been identified anatomical and radiographic changes, of the type of: limestone tendinitis, cervical spondilosis etc.

All three groups were treated for recovery for a period of 10 days. Subjects were evaluated clinically-functionally at the beginning of the study, after the treatment and 6 months later. Therapeutic procedure consisted of: physiotherapy, electrotherapy, massage. At the end of treatment, the subjects were instructed to follow a programme of physical therapy at home or at work, where possible, according to a learned protocol, 2 times per week.

The statistical analysis was performed with SPSS19 package consisting of descriptive analysis, using the Kolmogorov-Smirnov test to test the normal distribution, the Student test for comparison of means for two independent samples, "sensitivity to change" effect evaluated by calculating the waist and using following interpretation ES low = 0.20; Moderate ES = 0.50; Large ES \geq 0.80.

RESULTS

The results that we have obtained in examinations and tests applied have been introduced to facilitate the comparison of the following separate tables for each parameter studied in each group of patients. For group 1, consisting of 32 subjects, with a mean age 38.3 ± 2.71 , we obtained the following values:

Table no. 1. Values for the VAS scale for pain in group 1

Size	Subjects number	Mean baseline	Mean baseline after 10 days	Mean baseline after 6 months
Pain VAS Scale	32	1,8(a.s.=1,31)	1,5(a.s.=1,22)	1,6(a.s.=1,15)

There is a decrease in the mean pain at the end of treatment, statistically significant ($p < 0.05$), value that remains in plateau at the 6-month evaluation, registering a small effect.

Table no. 2. Values of the physical component (PCS) and mental (MCS) of the SF-36 in group 1

Size	Subject number	Mean baseline	Mean baseline after 10 days	Mean baseline after 6 months
PCS	32	71,1(a.s.=1,32)	71,2 (a.s.=1,12)	71,2(a.s.=1,63)
MCS	32	71,8(a.s.=1,14)	71,9 (a.s.=1,64)	71,9(a.s.=1,24)

The effect size obtained by comparing the initial physical function score, at the end of treatment was 0.04, which estimated a minimal effect of the treatment. This value was maintained when compared with the natural physical function at 6 months. Regarding the psychological component, the effect of the size calculated in the same way was 0.03, value which is maintained 6 months later.

Table no. 3. Mean values of the VAS scale for pain in group 2

Size	Subject number	Mean baseline	Mean baseline after 10 days	Mean baseline after 6 months
Pain (VAS scale)	43	3,8(a.s.=1,19)	2,1(a.s.=2,10)	2,5(a.s.=1,95)

The effect size for pain at the end of treatment was 0.44, which means a medium, and at the evaluation of six

months, we obtained a value of 0.09 (i.e. also a maintenance of the effect size)

The physical component after 10 days of treatment is 0.52, which suggests an average value of the effect. At 6 months after treatment, the value was 0.02, which means it maintains the plateau. Mental component size effect at the end of 10 days of treatment was 0.40, and at the end of the study, it was 0.02, therefore maintaining the plateau effect.

Table no. 4. Mean physical component (PCS) and mental (MCS) of the SF-36 scale in group 2

Size	Subject number	Mean baseline	Mean baseline after 10 days	Mean baseline after 6 months
PCS	43	63,1(a.s.=2,44)	65,9 (a.s.=2,04)	65,8(a.s.=2,16)
MCS	43	64,3(a.s.=2,15)	65,8 (a.s.=1,13)	65,9(a.s.=2,33)

The third group (group 3), consisting of 37 subjects, mean age 49 ± 3.15 presented values of VAS scores and SF-36 questionnaire, summarized in the tables below:

Table no. 5. Mean values for pain on VAS scale in group 3

Size	Subject number	Mean baseline	Mean baseline after 10 days	Mean baseline after 6 months
Pain VAS Scale	37	5,3(a.s.=2,19)	3,2(a.s.=2,10)	3,6(a.s.=1,34)

Table no. 6. The mean physical and mental component of the SF-36 in group 3

Size	Subject number	Mean baseline	Mean baseline after 10 days	Mean baseline after 6 months
PCS	37	51,3(a.s.=1,29)	53,7(a.s.=2,51)	56,6(a.s.=3,17)
MCS	37	51,1(a.s.=2,27)	52,9(a.s.=3,12)	55,1(a.s.=2,63)

We evaluated the effect size at end of treatment for pain and got a value of 0.43 (also an average value) and for the physical component - 0.51 (again an average value) and for the mental component a value of 0.31. The size effect 6 months after the treatment had a value of 0.11 for the VAS pain scale, so the effect was maintained in the set. For the physical component, we obtained 0.45 (an average which shows a further improvement obtained by treatment).

Mental component size effect at the end of study was 0.35, which suggests maintaining the plateau effect of the therapy.

DISCUSSIONS

The explosion of illness through WMSDs overwork drew the attention of the occupational medicine specialists and of others, leading to a series of actions that gradually established best practice guidelines, with a role in prevention, early detection and appropriate treatment.(4,5,6) There is a growing interest in this field in Romania, as well, our study being of the same areas of concern, as we have noticed a first manifestation of discomfort arising from the WMSDs overwork, the pain. The curr places great emphasis on the correlation between pain (the first and the common symptom which draws the attention of the worker and makes him seek medical attention), its intensity and the activity developed (7), which is consistent with our study that followed subjects from different professional categories with exposure to WMSDs overwork. Van den Heuvel claims that the psycho-emotional load and the improper social factors from the workplace affects the physical condition.(8) In the second group of patients, pain perception changes at the end of treatment were statistically significant ($p < 0.05$), at 6 months after the treatment, the values being maintained in the plateau

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were close ($p > 0.05$). For PCS, at the end of treatment we obtained a statistically significant difference ($p < 0.05$) and at 6 months, an averaged value close to that obtained at the end of treatment, the difference between them was not statistically significant ($p > 0.05$). For MCS, comparing the mean values at baseline with those obtained at the end of therapy, we achieved a statistically significant difference ($p < 0.05$), as the difference between the average values at the completion of treatment and at 6 months. ($P < 0.05$). Similarly, six months later, we achieved a statistically significant difference as against the assessment at the end of treatment ($p < 0.05$), meaning the maintainance of the beneficial effect of the treatment. For the MCS component, the comparison of the initial baseline values with those at the end of the therapy, we obtained a statistically significant difference ($p < 0.05$). The average value obtained at the 6-month assessment was significantly higher than that obtained and the end of treatment ($p < 0.05$). In the literature, there are studies that show that physical exercise has a moderate efficiency for the musculo-osteo-articular strain of occupational etiology. Further research is needed to investigate the beneficial effects of exercise in time, as well as to determine the essential attributes of physical exercise (intensity, duration, frequency).⁽¹⁰⁾ Adequate education of the subjects at risk of occupational diseases of the upper limbs and spine and stimulating physical exercises, the execution of certain activities may be important strategies for preventing the burden these diseases have ⁽¹¹⁾ and in order to maintain both the ability to work at normal parameters as long as possible, thus maintaining a high quality of life.

CONCLUSIONS

The recovery programme has proven effective on the subjects undergoing professional overload by improving the quality of life, both the physical size and the physical one, including those who had unsystematic clinical and functional changes on short-term and with spontaneous remission. The continuation of a constant kinesiotherapy programme led to maintaining the effects over time. Further studies are needed to elucidate all aspects of the beneficial effect of the prophylactic programmes, for example, the efficiency or on the contrary, of certain type of exercise in the prevention of certain types of strains.

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