

Management of Spinal Osteochondrosis Rehabilitation Process

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Abstract: Background: Osteochondrosis of spine is the one of the most prevalent diseases among the all musculoskeletal conditions. Osteochondrosis is not a curable condition and its treatment/rehabilitation is a long-term process. The present work aims to assess clinical effectiveness and duration of outcomes of rehabilitation that includes complex and consequent methods (algorithm) of treatment. The pilot study has been continuing several years and now is going on. Methods: The subject were 220 patients, 122 females and 98 males, aged 50-65 (adherence to treatment 100%) with as reflex as well radicular syndromes in subacute phase. Informed consent was obtained from all patients. Rehabilitation process continued 2.5-3 months and its management included the following consequent methods: waist fixation, pain control with medication (NSAIDs and in some cases steroidal drugs), iontophoresis with karipazim—20-25 sessions, after 8-10 sessions of the latter manual therapy was added—10-12 sessions, and kinesiotherapy (3 times per week) after 5 procedures. After pain management recommendation of daily life activity was given. Oral chondroprotectors after completion of a treatment were administered. Dynamic evaluation of subjective and objective symptoms, mobility and functional state of spine were done. Parameters were assessed before treatment, after 3 month and 1-3 years upon its completion. Results: Data were analyzed using SPSS program. Obtained results showed that after the first course of treatment (3 months) positive outcomes were observed in 198 patients (90%), 22 (10%) of patients required the second course of rehabilitation. Stable outcome of treatment was maintained after 1 year in 204 patients (92.7%) and after 3 years in 196 patients (89%). Conclusion: Approved complex of treatment is established to be effective in rehabilitation of patients with lumbar osteochondrosis.

Key words: Conservative comprehensive rehabilitation, management of spinal rehabilitation, lumbar osteochondrosis, iontophoresis with karipazim, manual therapy, kinesiotherapy.

1. Introduction

Osteochondrosis of the spine (osteoarthritis) represents a medical-social problem for the health system in all countries, due to its prevalence and frequency of related disability. It is one of the common diseases of the locomotor system and holds the third place in the list of widespread conditions. The frequency of spinal disorders is almost identical in both physically active and less physically loaded persons [1-4], pregnant person [5, 6], athletes. It is estimated that 10-15% of injuries attributed to sports are related to the spine injury [7]. Spinal diseases are

almost equally common in both males and females. Recent studies have shown that the pathology of the spine has quite rejuvenated. The pain of the waist and lower limb joints occurs after an intensive sports exercise or competition, as the initial symptoms of pathology require thorough assessment of the spine and/or large joints [8]. Recent researches in European populations show the gender related advantages of different risk factors for lumbar part of spine [9]. Men have high correlation with physical work, vibration effect, and relatively weak linkage with intense physical activity. In the Italian population, where the risk factors were explored in gender and genetic aspects, as well as in European research, women are at risk for age, excess weight, family history and weak

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linkage with physical activity. In the presence of these risk factors, there is a high risk of discopathy and disc herniation [10].

Despite the prevalence, osteochondrosis of the spine is not considered to be part of the ageing process. It is established that the condition is linked not only to degenerative-dystrophic but also to reparative processes.

The classification of the degenerative-dystrophy disorders of the spine is multi-component. It provides for localization of pathological changes, the level of changes, clinical form and other components. Recently, it has been proposed to classify the disease according to the Kelgren-Laurenes scale [11]. Kogan et al., [3] According to clinical manifestations spinal disorders are grouped into diseases with reflex and root syndromes. But introduction of ICD (international classification of diseases) 10 classification has partly changed out approach to these diseases. Chapter 13 of ICD 10 describes Diseases of the Musculoskeletal System and Connective Tissue. The chapter covers different bone-joint-muscle disorders, including the diseases of tissues surrounding the backbone. Spinal osteochondrosis, spondylosis, different localization syndromes caused by disc compression, biomechanical disorders are presented (M42, M47, M50, M51, M53, M54, M99, etc.), giving clarity to classification of spinal diseases.

At the same time, it should be noted that for rehabilitation of the spine diseases, it is most importance to determine the structural and functional status of the disease, i.e., determine the pathological substrate of the disease, pathogenesis of the disease and corresponding clinical diagnosis, and then select rehabilitation methods.

From the rehabilitation point of view of, a detailed analysis of the disease or syndrome is less important because some similar or related pathologies may have the same rehabilitation goal and path genetic impact on them resulting in long-term outcome of rehabilitation.

Our research of complex rehabilitation for lumbar osteochondrosis was based exactly on the above mentioned principle. While developing up the rehabilitation complex, we have taken into account the standard approach as well as modern research data. We encounter the clinical symptoms associated with the damage of the soft tissue surrounding the spine motion segment (reflexive stage) and intervertebral discopathy, formation of osteophytes on vertebrae, and intervertebral hole stenosis (root stage). Treatment/rehabilitation of osteochondrosis is long-term and there is no opportunity for complete cure. Almost every guideline of the world's leading countries recognizes the following rehabilitation principles: moderate movement, strengthening the spinal muscle system, liquidation of the inflammatory process by means of physiotherapy or medication, or surgical intervention.

The main goal of rehabilitation is to stimulate the regeneration processes; namely, to remove the reactive inflammatory process, improve trophic processes and blood circulation in the spine movement segment, stimulate the nervous system.

Researcher-doctors continue the search for complex treatment and rehabilitation.

The purpose of the presented paper is to determine the clinical effect and health outcome sustainability after the use of complex consecutive rehabilitation methods (so called algorithm).

2. Research Methodology

A pilot study has been going on for several years now and continues. The study sample was composed of 220 patients of both sexes, 122 females and 98 males, at age 50-65, with lumbar reflex as well as compression syndromes in subacute phase.

In our previous years' publications [11-15], we have described Caripazim electrophoresis for spinal and joint diseases. It is a lipolysis enzyme produced from papaya, produced in Georgia by the Institute of Biochemistry and we have a long experience of its

effective use. Other methods—manual therapy with soft techniques, independently or in combination with other methods, is used in the treatment of spinal disease based on the modern surveys [5, 16-26]. In some cases, manual therapy is associated with significant clinical improvement of chronic lumbar pain and can be used before invasive and expensive treatment [22]. The effectiveness of therapeutic exercises for rehabilitation of spinal and joint disorders, relief of pain, and the increase in the intervertebral disk height is also proved [10, 27-30]. Methods were selected to ensure the pathogenic nature of the interventions and impact almost all pathogenic rings, particularly have anti-inflammatory effect (removal of edema), and thus improve metabolism in the damaged region, reduce and “soften” osteophytes, improve regional blood circulation; increase the mobility of the spine and strengthen the spinal muscles (development of the so-called muscular corset).

The management of the rehabilitation process suggested by us captures consecutive use of following methods:

- (1) Waist fixation is necessary in the beginning;
- (2) Removal of pain with medicines (nonsteroidal and sometimes steroid);
- (3) Electrophoresis with Caripazim—20-25 procedures;
- (4) Manual therapy with soft technique—10-12 procedures after 8-10 procedures of electrophoresis;
- (5) After manual therapy or from 5th-6th procedures—kinesiotherapy 3 times a week—after pain relieve or with weakly expressed pain, long-term (2 months);
- (6) Recommendations on correct daily activities;
- (7) Chondroprotectors for 2-3 months courses, 2-3 times a year;

The rehabilitation process takes 2.5-3 months.

Subjective symptoms, spine mobility and functional status, as well as distant results were assessed in dynamics through a survey method. From the

subjective indicators the following symptoms were observed: discomfort and pain in the damaged spinal segment and irradiation area (during relaxation, motion and physical activity); sensory disorders; restriction of movement; From the objective signs: functional tests to determine lumbar rotation ability (test 1 cm), the spinal (test in 2 seconds), abdominal (test in 3 seconds) and femoral and tibias (test in 4 seconds) muscle abilities, as well as the spinal mobility: Schober, Otto and “Finger-Floor” tests [31]. The parameters have been studied before treatment, 3 months, 1 and 3 years after treatment. The data were statistically analyzed using SPSS, 16th version.

To identify the long-term results of treatment we used several evaluation criteria provided by O. G. Kogan and co-authors (1983). The patient should answer questions: whether the disease has been exacerbated, the duration of exacerbation (long or short), the nature of the remission, is it complete or partial (according to O. G. Kogan, 1983). The survey results were compared with the initial history data. Frequency of exacerbations—frequent (3 times per year and more), moderate (2-3 times per year) and rare (once per year); duration of exacerbation—long-term clinical manifestation is more than 1 month and short-term up to 1 month. The nature of remission, or clinical manifestation between exacerbations: the complete absence of the subjective signs of disease, or the residual symptoms that do not violate the coping activity; incomplete when the mild clinical manifestations are revealed.

Subjective and functional data are presented in Tables 1 and 3. As shown in Table 1, after completing a rehabilitation course, suggested by us, statistically significant positive rehabilitation results ($p < 0.001$) have been observed in the majority of patients (90%), meaning relieved subjective complaints and improved functional parameters. The 2nd course of rehabilitation was offered to the rest of patients. The study recruited 22 patients who had repeated rehabilitation after 1.5-2 months. The obtained

positive results (Table 2) are statistically significant ($p < 0.001$). The similar results were demonstrated in regards with the functional parameters (Table 4).

In order to determine the stability of the rehabilitation outcome, the 204 patients were surveyed after 1 year and 196 after three years.

The results are presented in Table 4. As shown in

the table, the majority of patients have a full or partial rehabilitation effect (92.7% and 89%) after 1 and 3 years.

Analysis: Based on the obtained data, we can assume that Caripazim electrophoresis at the initial stage of rehabilitation (due to its effect) leads to relief of reactive inflammatory symptoms, softening of

Table 1 Dynamics of subjective indicators in patients with lumbar osteochondrosis.

Indicators	Before rehabilitation N = 220	3 months after rehabilitation N = 198	<i>p</i>	
Discomfort or pain in spinal segment and irradiation area	In relaxed position	48	< 0.001	
	During movement	144		
	During physical exercise	28		
Sensory disorders	66	6	< 0.001	
Restricted movement	24	6		
Restricted spinal mobility and muscular strength	145	8		
“Schober’s” symptom	1.46 + 0.32	2.61 + 0.14	< 0.001	
“Otto’s” symptom	3.12 + 0.23	5.12 + 0.32	< 0.001	
“Finger-Floor” test	14.08 + 0.78	6.78 + 1.02	< 0.001	
Functional tests	# 1	15.54 + 1.2	< 0.01	
	# 2	27.43 + 0.98	< 0.001	
	# 3	20.08 + 0.76	< 0.001	
	# 4	9.44 + 0.72	22.78 + 0.84	< 0.001
	Left lower limb	9.26 + 0.70	20.56 + 0.72	< 0.001

Table 2 Dynamics of subjective indicators in patients with lumbar osteochondrosis after the II course of rehabilitation (n = 22).

Indicators	Before rehabilitation N = 220	3 months after rehabilitation N = 198	<i>p</i>
Discomfort or pain in spinal segment and irradiation area	In relaxed position.	3	< 0.001
	During movement	8	
	During physical exercise	6	
Sensory disorders	6	0	< 0.001
Restricted movement	0	0	
Restricted strength and weakness in lower limbs	8	0	

Table 3 Dynamics of functional indicators in patients with lumbar osteochondrosis.

Indicators	Before rehabilitation N = 220	3 months after rehabilitation N = 198	<i>p</i>	
“Schober’s” symptom	1.46 + 0.32	2.61 + 0.14	< 0.001	
“Otto’s” symptom	3.12 + 0.23	5.12 + 0.32	< 0.001	
“Finger-Floor” test	14.08 + 0.78	6.78 + 1.02	< 0.001	
Functional tests	# 1	15.54 + 1.2	< 0.01	
	# 2	27.43 + 0.98	< 0.001	
	# 3	20.08 + 0.76	< 0.001	
	# 4	9.44 + 0.72	22.78 + 0.84	< 0.001
	Left lower limb	9.26 + 0.70	20.56 + 0.72	< 0.001

Table 4 Long-term outcomes of rehabilitation in patients with lumbar osteochondrosis.

Disease course indicators		Before treatment(history) N = 220	1 year after treatment N = 204	<i>p</i>	3 years after treatment, N = 196	<i>p</i>
Frequency of exacerbations	Frequent	24	-		2	
	Moderate	196	8	< 0.001	3	*
	None	Primary 20	196		191	
Duration of exacerbations	Short-term	206	6	< 0.001	2	*
	Long-term	14	8		6	
The nature of remission	Complete	-	190	< 0.001	184	*
	Partial	-	8		12	

thickened ligaments (as well as post-operative scars) and osteophytes, which is due to administration of proteolytic enzyme in the area of damaged spinal segment; Thus, the prepared region and in parallel relaxed paravertebral muscles (Amplipulse therapy and medical massage) increase effectiveness of the manual therapy; and afterwards special exercises (kinesiotherapy), done in accordance with age and general physical training, strengthen the spinal muscles.

3. Conclusions

Rehabilitation process management in patients with osteochondrosis of the spine suggested by us (consistent and simultaneous use of the methods) can be considered as one of the most effective processes.

Initial rehabilitation with Caripazim creates a foundation for the effective use of other methods of rehabilitation.

The proposed rehabilitation methodology provides stable rehabilitation results (research 1 and 3 years later).

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