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# Generalized joint hypermobility and backache

Vladimir Eduardovich Li [a*], Andrey Vasilievich Chemeris[b], R.A. Kanaev [c], Asiya Erbulatovna Iglikova[d]

[a]Assistant of the Department of Traditional Medicine, Medical Academy of Postgraduate Education, Almaty, Almalinsky District, 118 Shevchenko st.
[b]Professor, Doctor of Medical Sciences, Head of the Department of Conventional Medicine, Medical Academy of Postgraduate Education, Almaty, Almalinsky District, 118 Shevchenko st.
[c]Doctor of Medical Sciences, Head of the Department of Oriental Medicine, Kyrgyz State Medical Institute for Retraining and Advanced Training, Iglikova Asiya Erbulatovna National Center for Independent Examination, regional expert
[d]National Center for Independent Examination, regional expert

**Abstract**

Relevance Hypermobility of the vertebral spine is characterized by a spur increase in the movement amplitude in the region of spine with the preservation of shape and without visible disturbances, as well as in the presence of a permanent axis of the joint motion. This issue is currently widespread among the patients with chronic pain syndrome. Generalized joint hypermobility provokes the occurrence of pain syndrome, but in most cases it is difficult to diagnose, especially in laboratory studies [5].

In medical practice, there is a so-called "syndrome" of joints hypermobility, which is characterized by a genetically determined state with a dominant inheritance character, the clinical manifestations of which are muscle and joint pain in individuals with excessive range of motion in the joints with the absence of other specific signs of connective tissue dysplasia, the presence of a florid pain syndrome (muscle and joint pain), as well as the "isolated" joints hypermobility is widespread, or the benign form when patients have no complaints [20]. The main manifestation of generalized joint hypermobility is their hyperextensible ligamentous apparatus, laxity of joint capsule and hypomyotonia of the muscles around the joint which, according to statistical observations, is recorded in 7 – 30% of patients. In most cases, the disease occurs in women and is mainly characteristic of the peoples of Africa, Asia and the Middle East. Thus, joint hypermobility syndrome is characterized as a complex of signs of joint hypermobility with clinical symptomatology [11].

The goal of the research: to review the literature on generalized joint hypermobility.

The methods of research: analysis of literary sources over the past 10 years.

Findings. Joint hypermobility is not considered a pathological condition but is a specific risk factor. This condition can be dangerous both for the functioning of the musculoskeletal system and the connective tissue structures of other systems of body. Generalized hypermobility of the vertebral spine joints is accompanied by a variety of pathological conditions, among which the leading position is occupied by pain (arthralgia, dorsalgia), crunch, clicks and others, the occurrence of which is associated with excessive extensibility of connective tissue structures and their increased sensitivity to mechanical stress.

**Keywords:** backache, pain syndrome, spine, joint hypermobility.

## INTRODUCTION

Diseases of the musculoskeletal system are widespread among the population, they are characterized by vivid clinical implications, the presence of a severe pain syndrome, as well as long-term disability [4]. The pathological processes associated with affect of the vertebral spine, in particular, luxations and subluxations in the joints of the spine, deserve special attention and study. As a result, the quality-of-life decreases, manifested by a decrease in physical activity and work

capacity. Severe pain syndrome as the main clinical manifestation in joint hypermobility makes the patients seek medical help [16].

According to S.P. Markin et al., It is the pain syndrome that determines the strong relationship between the joint hypermobility syndrome, arthralgia and dorsalgia. These pathological processes can be regarded as the diagnostic criterion for joint hypermobility. For example, chronic arthralgia can act as a large diagnostic criterion, the severity depends on the number of joints involved in the pathological process. Long-term pain syndrome can serve as a small diagnostic criterion [19].

Currently, generalized joint hypermobility is recorded on average in 10–15% of the population, and the characteristic feature of this disease is excessive movement in the joints. Joint hypermobility has a genetic predisposition and is quite often inherited through the female line [1].

As the pathological condition joint hypermobility is based on increased collagen extensibility. The vertebral spine is involved in the process of generalized joint hypermobility. Joint hypermobility associated with damage to the vertebral spine determines the development of such diseases as:

- nonspecific dorsalgia;
- scoliosis;
- Shoerman-Mau disease;
- spondylolisthesis;
- early osteochondrosis [22].

These pathological conditions are not a full-fledged and firm sign describing joint hypermobility, but numerous studies have determined that the above conditions of the vertebral spine are interrelated with the development of generalized joint hypermobility. In some cases, it was noted that patients with joint hypermobility not only do not have a severe pain syndrome, but also show the excellent results in sports that require increased flexibility (athletics, acrobatics, ballet) [13].

## MATERIALS AND METHODS

Analysis of literary sources over the past 10 years.

## RESULTS AND DISCUSSION

Statistical observations by researchers such as R. Grahame (1990), J.W. Jacobs (2014), D.B. Everman (1998) et al., show that hypermobility of individual joints occurs in most cases, sometimes generalized hypermobility is detected, and hypermobility of one joint is found very seldom. In some cases, joint hypermobility should be differentiated from genetic connective tissue diseases such as Ehlers-Danlos syndrome, Marfan syndrome, and osteogenesis imperfecta (brittle bone syndrome) [18].

Having analyzed the history of joint hypermobility discovery and study, one can reveal that until the middle of the XX century physicians studied such a pathological condition as "dysraphic status", which according to nosology was close enough to joint hypermobility. This condition was characterized as a complex of congenital malformations, in particular, in the skeleton and the nervous system [7]. However, the dysraphic status has not received further study due to disagreement among researchers on the clinical implications of the condition. In the 60s of the last century, the scoliosis classification was indicated. One of the forms in the proposed classification is "dysplastic scoliosis" - the pathological condition that represents a complex combination of joint hypermobility with flat foot and phenotypic skeletal anomalies. Then, in later studies, the separation of dysplastic and idiopathic scoliosis was not carried out due to similar clinical implications in both cases [9].

Thus, in the medical history of studying the joint hypermobility peculiarities, some periods can be distinguished when researchers were interested in the relationship between the pathological condition of the vertebral spine and manifestations of connective-tissue dysplasia [21]. Due to the specific clinical manifestations characteristic of this pathological condition, as well as due to the absence of genetic and biochemical markers, the study of the joint hypermobility peculiarities was considered prospective [3].

At present, the issue of studying the joint hypermobility peculiarities is very urgent. One of the aspects of interest is the study of biochemical markers, and in this direction there is a positive trend. It was found in the series of other studies that joint hypermobility can be considered as a specific manifestation of connective-tissue dysplasia [10]. This pathological condition represents the complex process that leads not only to the musculo-skeletal system malfunction, but also negatively affects the state of the connective-tissue matrix. The result of the research was the formulation of such a term as "hypermobility syndrome". This concept defines the condition of dysplasia [24]. From the point of view of clinical features, it reflects generalized joint hypermobility, on the other hand, it characterizes the ambiguity of a condition that is not limited exclusively to the musculo-skeletal system [15].

From a genetic point of view, joint hypermobility is caused by structural problems in the genes of the connective tissue protein - collagen. Such problems contribute to the emergence of hyperextensibility of the ligaments and the joint capsule. As a result, the mechanical strength of the connective-tissue components is sharply reduced. These pathological disorders lead to scoliosis, myopia, skin laxity, varicose vascular changes [6].

The main clinical implication of joint hypermobility is pain syndrome, in particular, arthralgia and dorsalgia, as well as crepitus and flicks. The emergence of such a pathological condition is explained by the supersensitiveness to the mechanical stress of the connective-tissue structures, which results in the occurrence of microscopic traumas of the circumarticular tissues. Bursitis and tendinitis can be observed as complications [7].

Dorsalgia is one of the main clinical signs emerging in generalized joint hypermobility. This pathological condition is characterized as backache.

In dorsalgia the pain syndrome arises or increases with prolonged stay of the patient in an upright position, as well as with prolonged sitting [17]. In dorsalgia the pain may disappear when the patient takes a recumbent position. Timely therapeutic measures also gradually reduce and remove the pain syndrome; centrally acting muscle relaxants in combination with analgesics or non-steroidal anti-inflammatory drugs are used as medications [25].

Scoliosis is no less common pathological condition observed in vertebral spine joints hypermobility. According to some statistical observations [11], the formation and development of scoliosis occurs in 5-7% of cases, is recorded in childhood and does not depend on gender. In patients under the age of 30, asymptomatic scoliosis can be detected, although the main clinical implication is the presence of pain syndrome and feeling of compression in the thoracic section of vertebral spine

(thoracalgia). Joint hypermobility is accompanied by scoliosis in 30–35% of cases [21].

With the vertebral spine joints hypermobility in young patients, osteochondropathy may be observed. This pathological condition can have the definitely pronounced dorsalgia. The prevalence of osteochondropathy with joints hypermobility is explained by a similar pathogenesis of development, when the error of collagen metabolism occurs [19].

With joints hypermobility, a pathological condition such as spondylolisthesis can be observed, which is characterized by the presence of low back pain. Due to the hyperextensibility of the connective-tissue elements in the vertebral spine joints hypermobility, a dislocation of vertebra relative to the subadjacent one can occur. So, as a result of experimental studies performed by Kirk J.H., Ansell B.M. and Bywaters E.G., more than 25% of patients with spondylolisthesis were identified from the total number of patients with vertebral spine joints hypermobility [16].

The studies performed by M.R. Isaev, showed that about 30% of patients with vertebral spine joints hypermobility complain of backache in combination with pain syndrome in the feet. This syndrome was observed after long walks, as well as under static loads. Some observations (Corben T., Lewis J.S., Petty N.J.) suggest that an increase in pain syndrome in the foot occurred at night, which characterizes the development of tarsal canal syndrome [19].

## FINDINGS

Generalized joints hypermobility is characterized as an extreme variant of the normal range of motion in the joints with nonspecific dysplasia of the connective tissue, due to the hyperextensibility of the ligamentous apparatus. Joint hypermobility has a hereditary predisposition, mainly passed through the female line. Generalized joints hypermobility is a predisposing cause for the development of vertebrogenic pain syndromes.

## CONCLUSION

Thus, generalized vertebral spine joints hypermobility is accompanied by a variety of pathological conditions, the leading position among which is occupied by dorsalgia. Pain syndrome may be accompanied by the development of scoliosis, as well as spondylolisthesis, which is associated with hyperextensibility of the connective-tissue elements.

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