

Postural defects – kyphosis, lordosis, sway back, flat back. Part two

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ABSTRACT

Posture defects are a serious social problem. It is very important to be able to distinguish between postural defects. A part of the second part of the paper presents a description of kyphosis, lordosis, sway back and flat back.

Keywords: kyphosis, lordosis, sway back, flat back, physiotherapy

KYPHOSIS

Kyphosis, or chest hyperkyphosis, is characterized by increased curvature of physiological curvature in the thoracic section of the spine, which is often compensated in adjacent sections (cervical and lumbar lordosis). The defect can be distinguished between low kyphosis (kyphosis peak displaced downwards) and high kyphosis (kyphosis peak displaced upwards). If there is a visible bend in the upper thoracic part of the spine, this type of round back is called "kyphotic", while if the spine is bent towards the back, we call this type of "sitting" or "total kyphosis". A characteristic feature of the kyphosis is an increased kyphosis along the entire length of the thoracic spine, which is accompanied by asymmetry of the spine

muscles. The described defect is characterized by weakened back muscles and shrunken chest muscles. The silhouette of a person with the discussed problem is characterized by the positioning of the head and shoulders in the prostration, flattened and collapsed chest, protruding and pushed away from the line of spinous appendixes, and over-emphasized thoracic kyphosis. Additionally, the defect is accompanied by decreased mobility of the upper ribs and shoulder joint. The respiratory function of the chest is impaired. The angle of pelvic anterior inclination is reduced. There are kyphosis, acquired and congenital. Congenital kyphosis are formed only on osteogenic or hereditary grounds or they are a defect coexisting with scoliosis. The reason for the formation of the acquired kyphosis may be a consequence of diseases such as tuberculosis, rickets, ankylosing spondylitis, Scheuermann's disease. Another reason for this defect may be overloading of the spine rectifiers by static work (at work or at school during a bad body position), which causes imbalance of muscle tensions in the spine muscles. They may also be the so-called embarrassing kyphosis, which is a result of a defect in vision.^{1, 2, 3, 4, 5, 6, 7, 8}

The size and shape of thoracic kyphosis is influenced by the following factors: age, temperament, somatotype, hereditary predisposition, visual abnormalities, emotional factors, shape and extent of cervical and lumbar lordosis, torso muscle tension and strength.⁹

In thoracic hyperkyphosis, weakened and stretched muscles include: parallelogram muscle, quadrilateral muscle, widest dorsal muscle, deep dorsal muscles (especially the neck muscles and the rectifier of the dorsal part of the thoracic spine). Additionally, in the discussed defect there are excessively stretched back, yellow, intercostal and supracostal ligaments. Muscles that are excessively tense (strengthened), shrunken are chest muscles (greater and smaller chest muscle, as well as anterior toothed muscle). The longitudinal longitudinal ligament of the anterior spine is contracted.^{10, 11}

Untreated hyperkyphosis leads to irreversible structural changes caused by musculoskeletal dystonia, anterior long ligament calcification, vertebral arthrosis, lower chest mobility - which results in a higher probability of developing respiratory diseases, crushing of the intervertebral cartilage on the opposite side, adhesion of vertebral bodies. The above mentioned effects of untreated hyper-erkiphosis lead to its fixation.¹²

LORDOSIS

Lordosis is characterized by deepened lumbar lordosis, reduced thoracic kyphosis and increased pelvic anterior angle. Physiologically, the lumbar spine is bent forward (lumbar

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lordosis). Its size and shape may be influenced by factors such as: age, shape and position of the pelvis (related to the length, tension and strength of muscles that stabilize the hip joints), somatic type, hereditary predispositions, temperament, degree of mobility of the chest curvature.^{13, 14, 15, 16}

The silhouette of a person suffering from the discussed defect is characterized by a raised abdomen, accentuated buttocks, increased pelvic forefoot inclination and deepening of lumbar lordosis. Location of lesions occurs mainly in the lumbar spine, forming its deepening (lumbar hyperlordosis) and often compensating it by forming deepened thoracic kyphosis. The chest is narrow and the abdominal muscles weakened. The muscles of the spine, back surface of the thighs and buttocks are asymmetrical.^{17, 18, 19, 20}

In lumbar hyperlordosis, weakened and excessively stretched muscles include: gluteal muscle, sciatic and shin muscles, abdominal muscles (especially straight abdomen's umbilical cord). Muscles that are excessively tense (strengthened), shrunken are the hip and lumbar muscles, quadrilateral muscles of the lumbar region, straight muscles of the thighs and the rectifier muscle of the back of the lumbar region.^{21, 22}

We distinguish between concave, acquired or congenital backs. The most common form of concave back is an acquired concave back, which is a consequence of muscle dystonia.²³

The shape, extent and size of lumbar lordosis is closely related to the shape, extent and size of thoracic kyphosis. The displaced peak of lordosis, usually associated with changes in lordosis extent, includes low short lordosis, which in most cases is accompanied by long-arc kyphosis and high lordosis including the lower part of the thoracic spine (sometimes reaching Th6) is accompanied by short high kyphosis.²⁴

Untreated hyperlordosis is a consequence of shrunken ligaments and muscles. It causes secondary changes - "spinal pains". This is due to the overload caused by the obstruction of the pelvis. The L5 vertebrae can slide forward on the S1 vertebrae, causing damage to the ligamentous system, the intervertebral disc and the nerve roots. As a result, degenerative changes and prolapse of the gelatinous nucleus occur. Spinal pain syndrome is formed. When sitting on a chair, normal lordosis is completely eliminated, whereas when leaning forward it turns into kyphosis.²⁵

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SWAY BACK

Sway back is characterized by deepened lumbar lordosis, compensatory deepening of thoracic kyphosis, increased pelvic anterior angle, increased resistance of the spine to protruding and dislocated shoulders. In many cases, the head, neck and shoulders are placed in prostration, while the chest is flattened and with limited mobility, which results in a smaller share of breathing. The abdomen is bent forward, the buttocks are emphasized, the knees are bent to the highest degree. Asymmetry of abdominal compressor muscles, spine, back of thighs and buttocks. Usually the cause of this defect is an increase in pelvic anterior angle, which results in increased lumbar lordosis and, on the basis of compensation, deepened thoracic kyphosis. Round-concave back is a combination of round and concave back and is usually the result of a two-fold compensation. The defect may arise from the need to compensate for one of the sections that is rigid (most often in Scheuermann's disease, spinal tuberculosis or injury). Another reason for the defect may be a passive adaptation in the case of flaccid structure and the need to balance (from a functional and morphological point of view) the changes or stiffness of the existing, in any of the curvatures of a physiological nature. If the appropriate treatment is not implemented, the condition will deteriorate and become permanent.^{26, 27, 28, 29, 30, 31, 32}

The pathologically altered shape of the spine affects the muscles and ligaments. The muscles of the dorsal rectifier are stretched in the thoracic section and shortened in the lumbar section. Other shrunken muscles are the muscles of the chest and shoulder girdle. The organs of the abdominal cavity are moved forward (through increased lordosis) causing stretching of the abdominal muscles. The gluteal muscles are weakened.³³

In sway back, weakened and stretched muscles include: superficial back muscles (especially quadriceps, broadest back muscles and parallelogram muscles), deep back muscles (dorsal and neck rectifier muscles), gluteal muscles, sciatic and shin muscles, abdominal muscles (the navel part of the straight muscle). The following ligaments are also stretched: yellow, intercostal, supracostal and long back ligaments. Muscles that are excessively tense (strengthened), contracted are chest muscles (greater and smaller chest muscles, as well as anterior toothed muscles), quadrilateral muscles of the lumbar system, hip and lumbar muscles, straight thigh muscles and a rectifier muscle of the back of the lumbar system.^{34, 35}

FLAT BACK

Flat back is characterized by a decrease or lack of thoracic kyphosis and lumbar lordosis. Reduction or lack of physiological bends results in a reduction or lack of cushioning function of the spine. The pelvis is in a more horizontal position, with reduced pelvic anterior angle. The individual elements of the spine that contribute to degenerative changes are overloaded. If you have a flat back, you will experience flattening and reduced chest mobility.

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The spine, by reducing or lacking physiological curves, has reduced immunity, which results in overloading and faster wear of soft parts of the spine, predisposing to degenerative changes if the muscle system is too weak. Compressive fractures associated with mechanical damage and degenerative dystrophic changes of the spine may also occur. The formation of lateral curvatures of the spine may occur - scoliosis.^{36, 37, 38, 39}

Two cases of flat back can be distinguished. A person who has an asthenic structure with underdeveloped muscles and a person who has well-developed, strong muscles, started to exercise early with a heavy physical strain.⁴⁰

In the flat back, the weakened and excessively stretched muscles include: chest muscles (large and small chest muscles, small, toothed front muscles). The weakened muscles also include simple thigh muscles, hip-lumbar muscles, quadrilateral lumbar muscles and the rectifier of the back of the lumbar section. The longitudinal longitudinal ligament of the anterior spine is also weakened. Muscles that are excessively tense (strengthened), shrunken are the superficial muscles of the back (parallelogram muscle, quadrilateral muscle and the widest back muscle), deep muscles of the back (rectifier of the back of the thoracic section, neck muscles) and abdominal muscles, sciatica and shinbone muscles and gluteus muscles.^{41, 42}

The discussed attitude deficiency is more and more common in children and adolescents. Doctors consider sedentary lifestyle to be the cause of the defect, which affects impoverishment and limitation of practical forms of movement and muscle weakness.⁴³

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