

# Research Journal of Pharmaceutical, Biological and Chemical Sciences

## The Problem Of Flatfoot And Approaches To Its Solution.

Makhov AS, and Medvedev IN\*.

Russian State Social University, st. V. Pika, 4, Moscow, Russia, 129226.

### ABSTRACT

A modern person often registers the pathology of the musculoskeletal system, which disrupts the function of movement and creates a lot of problems with social adaptation. One of the variants of this pathology is flat feet. This is a chronically current disease, prone to progression. They can provoke a number of specific manifestations: a gradual increase in pain, clubfoot; unnatural posture, curvature of the spine, development of scoliosis and osteochondrosis of the spine, ingrown nails, dystrophic changes that develop in the muscles of the back and legs, the development of diseases directly related to the lesion of the feet. To weaken the manifestations of flatfoot, you can correctly choosing orthopedic shoes. High heels are excluded, as its optimal variant its height is considered, not more than 4 centimeters. As an additional measure for the prevention and treatment of flatfoot, the need for physical exercise and gymnastics is considered. To relax the muscles and to relieve the overall tension of the legs, during the day, baths are recommended. In the presence of excess body weight should try to reduce it. If symptoms appear that indicate the presence of flat feet, it is necessary to be monitored regularly by an orthopedic surgeon.

**Keywords:** health, flatfoot, locomotor system, rehabilitation, physiology, feet.

*\*Corresponding author*

## Introduction

Health consists of a large number of components [1,2]. Only the presence of all of them ensures the optimum functioning of the body [3,4]. However, the body often has various predispositions to the development of the pathological process [5-10]. With adverse environmental influences, they inevitably begin to activate the effects of damaged genes, which forms diseases [11,12], often turning into a chronic form of flow [13]. Often, pathology in a modern person is recorded in the musculoskeletal system [14]. At the same time, the function of movement is disturbed and a lot of problems with social adaptation are created [15].

One of the variants of this pathology is flat feet. It is associated with the deformation of the foot, in which its arches are lowered. As a result, there is a complete loss of the damping and spring functions inherent in the foot. Flat feet, has a number of characteristic symptoms including pain in the calf muscles and a feeling of stiffness in them, increased fatigue when walking and long standing, increased pain in the legs by the end of the day [16]. Given the prevalence of this pathology and the urgent need to continue the search for the rehabilitation of this category of patients, the goal has been set: to consider aspects of the problem of flatfoot and approaches to its solution.

### Questions of etiology and pathogenesis of flatfoot

Normally, the structure of the foot includes a lot of ligaments, joints and bones, due to the peculiarities of their connection with each other in humans it is possible to walk. The presence of arches in the foot allows it to rest on the ground when walking not with its entire surface, but only with localization areas of three main points sufficient for this [17].

Among the main reasons provoking the development of flat-footedness, include overweight, pregnancy, features of work, causing excessive physical exertion; heredity; wearing poor quality shoes - too narrow or small shoes, weakness of the ligaments and muscles of the feet, due to the lack of appropriate stress or age. There is congenital flatfoot. This variant of pathology is rare - it accounts for about 11% of the total number of pathologies associated with a lesion of the foot. Various forms of exposure to the fetus during its prenatal development can provoke congenital flatfoot, in particular, this may be due to the harmful habits of the mother, exposure to radiation. In addition, flatfoot may be due to rickets. In this case, it is associated with the previous development of rachitic foot in children, which occurs against the background of vitamin D deficiency [18]. Because of this, the musculo-ligamentous apparatus is weakened, which is a direct development of flatfoot. Flat feet can also be paralytic. It develops against the background of previous polio transmission. The degree of flatfoot in this case is directly determined by the intensity of the severity of the manifestation of concomitant paralysis. Fracture of the bones may be another reason for the development of flatfoot. In this case, traumatic flatfoot is considered. Its symptoms are manifested in fractures affecting the bones of the foot. In addition, this type of flatfoot may develop as a result of improper fusion of the bones, against the background of previous fractures. Flat feet can also be static. This variant of flatfoot is diagnosed most often due to a decrease in muscle tone and develops as a result of too much overwork, against the background of a prolonged load on the legs [19].

Under the condition of deformation of the arches of the foot, the emphasis is fully implemented, as a result of which the shock-absorbing properties of the foot are disturbed, and this causes the development of symptoms of flatfoot. If the ligaments and muscles in the foot cease to properly ensure the functions assigned to them, ceasing to work and losing their inherent strength, the normal shape of the foot is also impaired. As a result of the settling of the foot against this background, as well as due to its adoption of a completely flat position, the spring function is also lost. This leads to the fact that the load, previously imposed on the foot, begins to be compensated by the joints of the legs. In other words, the ankle joint, the knee joint and the hip joint are already involved. Naturally, with such a substitution of functions, an even greater load falls on the spine. Considering that neither he nor the joints involved are intended to directly participate in the functions performed during such deformation, they are not very successfully performed by them. Considering such features of the pathological process associated with flatfoot, it becomes clear that the mechanism of pain in the legs and pain in the spine. The pain in case of flat-footedness appears at such a stage, which can be described as a lack of body forces to ensure safe and normal movement even at the expense of the compensation method, which is so unusual for him.

The result of the influence of flatfoot becomes pain in the hip, ankle and knee joints. In addition, due to the load exerted on the spine, posture in patients can also become pathological. Against the background of the pathological changes associated with the work of the musculoskeletal system, scoliosis and arthrosis can later develop. In addition, flatfoot causes in many cases the development of varicose veins. In this regard, it is extremely important to maintain the ligaments and muscles in the normal state to perform their functions, that is, in a state of elevation. This disease can develop not only in people whose professional or general daily activities consist in the necessity of staying in a standing position, but also in people whose activity is connected with working in a sitting position. This is due to the fact that in the sitting position the ligaments and muscles lose their inherent strength, becoming weak, and in the standing position, on the contrary, the load is too strong, which also weakens them [20,21].

### Symptoms of flatfoot

**Symptoms of longitudinal flatfoot.** Longitudinal flatfoot is accompanied by contact with the floor surface of the foot completely, which causes an increase in its length. The main feature, corresponding to the manifestation of the longitudinal flat-footedness, is the reduction of the distance that normally forms between the floor surface and the foot from its inner edge. Longitudinal flat-footedness also becomes the cause of the development of clubfoot, as a result of which shoe wear follows a certain “pattern”: on its inner side along the length of the heel and the sole. In this version of flatfoot, there are three degrees of deformity of the foot [22].

**The first degree of flatfoot** is characterized by the absence of visible deformation, which is caused by the still weak expression of the accompanying changes. Symptoms of flatfoot at this stage manifest as fatigue in the legs after experiencing significant physical exertion. Pressing on the foot area is accompanied by the occurrence of pain. Towards evening, this symptom may be supplemented by a disturbance in the smoothness of the gait against the background of accompanying sensations, as well as swelling of the feet [23].

**The second degree of flatfoot** is characterized by moderate severity of flatfoot. The arch of the foot at this stage of the disease disappears. The pain becomes stronger, it appears much more often. In addition, its spread to the ankle area, as well as to the tibia, is noted. The smoothness of the gait at this stage of the disease disappears, the foot muscles lose their inherent elasticity.

**The third degree of flatfoot** is manifested in an even more pronounced form, which is also accompanied by increased strain. Swelling and pain in the feet become permanent, in addition to this recorded a severe headache. There is also pain in the lumbar region. There is a decrease in the ability to work, difficulties arise even when it is necessary to overcome small distances. The third degree of flatfoot often makes it impossible for a person to walk, being shod in ordinary shoes due to the pronounced deformity of the foot [24].

### Main symptoms of transverse flatfoot

Transverse flatfoot is accompanied by a decrease in the length of the foot, which is due to the divergence of its component bones. There is a deviation outwards of the thumb with the accompanying deformation of the middle finger. In addition, there is a bone thickening in the base of the thumb, which has a lump shape and is accompanied by a manifestation of pain. This form of flatfoot is also accompanied by various stages of progression, on the basis of which there are three degrees of transverse flatfoot.

**The first degree of cross flatfoot** is characterized by a weak expression changes. The angle of deviation of the first toe does not exceed 20 degrees. Prolonged standing or walking, accompanied by fatigue. In the location field 2-4 fingers formed a characteristic thickening of the skin – corns. In addition, there is mild tenderness and redness, detected by the first finger on the foot.

**Second degree transverse flatfoot.** The angle of deflection of the first finger is from 20 to 35 degrees. The load is accompanied by a burning sensation in the foot, as well as pain in it and in the area of the first finger. The knees at this stage of the disease increase in size. The toes of the foot begin to flatten out when the feet are placed on the surface.

**The third degree of transverse flatfoot** is manifested by the greatest manifestation of manifestations. The angle of deviation of the thumb from 35 degrees or more. When the load appears a strong pain in the foot. Its front section is spread out. Tentacles in the area of fingers reach significant sizes. The position of the first toe sharply changes, resembling a dislocation. At the same time, 2-4 toes of the foot experience severe deformation, which can lead to the development of bursitis [25].

As for the mixed flatfoot, it is accompanied by the manifestation of symptoms inherent in both considered forms, that is, the symptoms of the transverse, and the symptoms of the longitudinal flatfoot. In this case, shoes wear out too quickly, especially noticeable in the presence of her heel. Physical activity causes soreness of the feet, rapid fatigue of the legs with the appearance of heaviness in the legs and cramps by the end of the day, there is a feeling of increasing legs in size in length and width, which makes it necessary to buy shoes of larger size [26].

### **Diagnostic issues of flatfoot**

Flat feet can be determined not only on the basis of the clinical manifestations of the disease, but also using certain methods. Based on the results of the study, you can establish the stage of the pathological process. As such methods are used plantography, podometry, the method of analysis of Face, X-ray and clinical diagnostic methods. Plantography makes it possible to determine the degree of manifestation of flatfoot on the basis of the results of foot prints, for which they are smeared with a special solution, and then they make prints on paper when relying on it with the whole weight. Conducting podometry makes it possible to determine the percentage ratio between the length of the foot and its height. The basis for the clinical diagnosis is the construction of a triangle having a base corresponding to the distance between the location of the head of the first metatarsal bone and the calcaneal tubercle [27,28].

### **Basics of treating flatfoot**

Treatment of flatfoot, aimed at eliminating pain accompanying this disease in the affected area. It is important to strengthen the ligaments and muscles of the leg, along with the restoration of the functions inherent in the foot. Treatment of flatfoot can be conservative with the use of various medications or procedures and surgical. Conservative treatment consists in the implementation of physiotherapeutic measures and in the performance of certain exercises of therapeutic gymnastics. In addition, special orthopedic shoes with an insole are selected. Foot baths and massages are recommended. As an effective treatment of non-expressed flatfoot in children, baths with the addition of river pebbles are used in them. This can help improve the condition of the foot. At an early stage of treatment of flatfoot in children, it is enough to ensure rest, and the cessation of physical exertion [29-31].

### **CONCLUSION**

Flatfoot is a chronically current disease, prone to progression. This may have a number of specific manifestations: gradual increase in pain, clubfoot, unnatural posture, curvature of the spine, development of scoliosis and osteochondrosis of the spine, ingrown nails, dystrophic changes developing in the back muscles and legs, the development of diseases associated with lesions of the feet. To weaken the manifestations of flatfoot, you can correctly choosing orthopedic shoes. High heel is excluded - its height should not be more than 4 centimeters. Exercise and gymnastics are considered as an additional measure for the prevention and treatment of flatfoot. To relax the muscles and to relieve the overall tension of the legs, during the day, baths are recommended. In the presence of excess body weight should try to reduce it. At occurrence of the symptoms indicating the presence of flat-footedness, it is necessary to observe regularly with the orthopedic surgeon.

### **REFERENCES**

- [1] Bikbulatova AA. (2018) Creating Psychological Comfort In Women Who Wear Corrective Clothing For A Long Time. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1112-1121.
- [2] Zavalishina SYu. (2018) The Functional State Of Vascular Hemostasis In Calves During The Neonatal Phase. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1507-1512.

- [3] Zavalishina SYu. (2018) Physiology Of Antiaggregatory Manifestations Of The Vascular Wall In Newborn Calves With Iron Deficiency, Receiving Metabolic Significant Effects. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1530-1536.
- [4] Zavalishina SYu. (2018) The Functional State Of Primary Hemostasis In Newborns Calves With Dyspepsia. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1543-1549.
- [5] Zavalishina SYu. (2018) Dynamics Of The Functional State Of Platelet Functions In Newborn Calves Receiving Correction For Dyspepsia. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1566-1572.
- [6] Zavalishina SYu. (2018) Physiological Control Of The Vascular Wall Over Platelet-Induced Aggregation In Newborn Calves With Iron Deficiency. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1601-1606.
- [7] Zavalishina SYu. (2018) Functional Features Of Primary Hemostasis In Newborns Calves With Functional Disorders Of The Digestive System. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1630-1636.
- [8] Zavalishina SYu. (2018) Elimination of platelet dysfunctions in newborn calves with functional digestive disorders. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1650-1656.
- [9] Zavalishina SYu. (2018) Prevention Of Violations Of The Functional Status Of Platelet Hemostasis In Newborn Calves With Functional Disorders Of The Digestive System. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1672-1678.
- [10] Zavalishina SYu. (2018) Physiological Properties Of Platelets In Newborn Calves With Functional Disorders Of The Digestive System, Treated With The Sorbent "Ecos". Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1697-1702.
- [11] Zavalishina SYu. (2018) The Dynamics Of The Physiological Properties Of Hemostasis In Newborn Calves With Functional Disorders Of The Digestion Against The Background Of Their Consumption Of Needles Extract. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1726-1731.
- [12] Zavalishina SYu. (2018) Functional Features Of Vascular Hemostasis In Calves Of Dairy Nutrition. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1754-1759.
- [13] Rimashevskaya NM, Lunyakova LG, Shabunova AA. (2012) Health and healthy lifestyle of young people. Population. 4(58) : 083-086.
- [14] Vorobyeva NV, Mal GS, Zavalishina SYu, Glagoleva TI, Fayzullina II. (2018) Influence Of Physical Exercise On The Activity Of Brain Processes. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 240-244.
- [15] Bikbulatova AA. (2018) Functional Features Of Microcirculatory Processes In Obese Women Against A Background Of Long Daily Wearing Of Corrective Clothing. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 785-793.
- [16] Gusarov AV, Kornev AV, Kartashev VP, Nekrasova MV. (2018) Effect Of Static Exercises With A Deflection On The Tone Of The Skeletal Musculature Of Middle-Aged Women. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(4) : 1716-1724.
- [17] Zavalishina SYu. (2018) Functional Activity Of Vascular Hemostasis In Newborn Calves With Iron Deficiency. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1490-1496.
- [18] Uminskaya MB, Commercial SP. (2018) The effect of exercise on the musculoskeletal system. Perspectives of science. 4(103) : 122-124.
- [19] Zhalilov AV, Mironov IS. (2018) Identification Of The Most Significant Shortcomings Of Sports Competitions In Sambo Among People With Hearing Impairment In A Separate Region Of Russia. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(3) : 672-677.
- [20] Zavalishina SYu. (2018) Physiological Features Of Primary Hemostasis In Newborns Calves With Functional Digestive Disorders. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1514-1520.
- [21] Zavalishina SYu. (2018) Functional Features Of Hemostasis In Calves Of Dairy And Vegetable Nutrition. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1544-1550.
- [22] Zavalishina SYu. (2018) Functional Activity Of Primary Hemostasis In Calves During The First Year Of Life. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 9(6) : 1575-1581.
- [23] Chuchkina RF, Efimova NV. (2006) Anatomy and morphology of man. Section "Musculoskeletal system". Chelyabinsk, 107.
- [24] Mandrikov VB, Gavrikov KV, Tsarapkin LV, Krayushkin AI, Perepelkin AI. (2008) Musculoskeletal (aspects of clinical anatomy and rehabilitology). Volgograd, 134.



- [25] Tsarapkin LV. (2007) Methodological approaches to the use of exercise therapy in disorders of the musculoskeletal system. Bulletin of the Volgograd Scientific Center of the Russian Academy of Medical Sciences and Administration of the Volgograd Region. 3 : 39.
- [26] Smirnova LM, Tkachuk IV, Vedenina AS, Gaevskaya OE. (2014) Instrumental and methodological support for the study of unbalance loads in the musculoskeletal system. Medical equipment. 2(284) : 40-43.
- [27] Bulanova EV, Osipov VG. (2011) The interdependence of functional and structural processes in the musculoskeletal system. Physical culture and sport of the Upper Volga. 4 : 58-65.
- [28] Borisov AV. (2011) Calculation of deformations that occur during loads in the human musculoskeletal system. News of Smolensk State University. 4(16): 114-118.
- [29] Apanasyuk LA, Soldatov AA. (2017) Socio-Psychological Conditions for Optimizing Intercultural Interaction in the Educational Space of the University. Scientific Notes of Russian State Social University. 16(5-144) : 143-150. doi: 10.17922/2071-5323-2017-16-5-143-150.
- [30] Maloletko AN, Yudina TN.(2017) (Un)Making Europe: Capitalism, Solidarities, Subjectivities. Contemporary problems of social work. 3 (3-11) : 4-5.
- [31] Pozdnyakova ML, Soldatov AA. (2017) The Essential and Forms of the Approaches to Control the Documents Execution. Contemporary problems of social work. 3 (1-9): 39-46. doi: 10.17922/2412-5466-2017-3-1-39-46.