

Early Detection Of Foot Deformity At Younger School Age

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Abstract: *The foot undergoes major developmental changes through various stages of growth and development. Anthropometry and the appearance of the feet throughout childhood have been monitored and analyzed for many years. The sample of respondents included 126 unofifth-graders, aged 10-11, divided into two subsamples, rural and urban. Representation of a certain degree of deformity I, II, III lowering of the feet using a certain formula. Research has shown that a large number of primary school children in rural areas do not have impaired foot status; by comparing the results of the confirmation. The hypothesis is that rural children have better foot status than urban children. Only regular monitoring of the child's condition will contribute to a preventive and timely solution to the problem.*

Keywords - pes planus; urban; rural; analyze; children; school

1. INTRODUCTION

Postural status is very important in the functioning of the human body. The pattern of good posture, if created in early childhood, not only contributes to the proper growth and development of children, but later has a positive effect on their health and quality of life [2]. Forming proper posture, among various other known factors, depends largely on the engagement innoteachers, professors and parents, but also physique levels noactivities [6]. Due to poor posture in children, health problems can occur in later life, which affect their quality of life. Muscles play the most important role in forming and maintaining proper posture, as an active part of the locomotor system [11]. Weakness of certain muscle groups, their excessive and one-sided load, can cause various disorders on the spine, chest, upper and lower extremities, and especially on the foot [9].

A flat foot (pes planus) is manifested in the loss of normal, physiological arches of the foot to a greater or lesser degree [20].

We distinguish three coversnoon the period of occurrence of bodily deformities. First covernonor is the period of erection (the period of walking), the second is going to school, [23]. Sudden bone growth is not accompanied by adequate muscle strength, which leads to instability of the musculoskeletal system causing various body deformities [18].

When designing shoes. When it comes to children, the anthropometric data of this group are of great importance [4]. The quality of the feet improves the health and comfort of the feet. Whichand does not correspond to the structure of the foot, which is used at a young age, can lead to permanent deformities of the feet.

However, foot deformities that can be observed in youth can be eliminated before reaching the developmental period [7].

Flat feet in children should have a normal physiognomy and no pain (asymptomatic). In children, the pain is manifested in the arch or on the back of the leg when walk in gnoactivities [20]. Other causes of flat feet that are less common may be due to hypermobility. It is used to describe the ability to move joints outside the normal range of motion [21]. Hypermobility of the joints isnoesta in the general population. It may be present in only a few joints or be widespread. If it is serious, there may be a contributing genetic factor that may need further testing, which is in the domain of general practitioners [8].

Sports and all forms of physical activities have a confirmed health-preventive impact, so it is very important to teach children as early as possible, ie. to train, to engage in sports, physical activity, to increase general motor ability, which has an important role in the movement of individual organs, as well as the whole body [17].

2. METHOD OF WORK

2.1 Sample of respondents

The sample of respondents included 126 fifth grade students, aged 10-11. The sample of respondents was separated from two primary schools. Out of that, 59 students of the elementary school "Milan Rakić" from Karanovac, 35 girls and 24 boys (urban area), and 67 students of the elementary school "Dositej Obradović" from Kneževo, of which 41 girls and 26 boys (rural area).

2.2 Sample of measuring instruments

The presence of flat foot deformities in students of both schools is determined. In order to determine the status of the feet, the plantographic method was used. The advantages of this method are reflected in the following:

- objectively measures the status of the feet;

- it is relatively easy to apply to a large number of respondents and does not require any special conditions for implementation;
- it is reliable and accurate;
- it was well received by the respondents;
- the obtained results can be statistically presented.

All plantograms were processed by Thomson's method.

2.3 Description of the experimental procedure

The work was done by departments. First, the students were explained what they needed to do. Barefoot stand in a metal container (30x40) about 3 cm deep, at the bottom of which is gauze soaked in this case with purple ink dissolved in water in a ratio of 2:1. The subject then normally steps with one foot and the other on two sheets of A4 paper corresponding to the child's normal step, which is located in front of the bowl. Then he stands on a wet and then a dry towel to wipe his feet. When stepping out, it should not stay on the paper longer because it sticks to the foot, so the print must be repeated. Then both papers with prints are taken, and the name and surname of the student are written on them.

After the test, the students took a shower in the locker room if they needed to wash their feet. Everything went in an extraordinary atmosphere and cooperation between students and teachers and was completed within 2 days.

2.4 Data processing method

The obtained data were processed by descriptive method. The percentage of a certain degree of deformity (I%, II%, III% foot drop) was calculated separately using the formula:

$$\frac{\text{Number of students with certain deformities}}{\text{Total number of students (N)}} \times 100 = \%$$

The total number of students varies depending on the required results: whether it is all students, whether it is especially boys or girls, etc. In an effort to solve the set tasks in showing the difference in the status of the feet of children in urban and rural areas, the most elementary statistics were used, namely the percentage of the obtained data with comparative analysis. All data were processed using a desktop calculator.

If we compare the status of the feet of boys from both schools (Table 1), we see that the boys from Kneževo Elementary School "Dositej Obradović" have slightly better results, but they are not statistically significant. They have a small advantage in terms of the presence of a good foot as well as slightly less present students with impaired foot status.

3. RESULTS WITH DISCUSSION

The foot undergoes major developmental changes through various stages of growth and development. Anthropometry and the appearance of the feet throughout childhood have been monitored and analyzed for many years [12,13]. Foot development depends a lot on footwear, and this segment is increasingly neglected nowadays, as fashion and other trends are more closely followed [14,22], and all together they affect the development, function and health of the feet [1,19].

By analyzing the results of the students of the elementary school "Milan Rakić", we see that the status of their feet is very good. Thus, the good left foot has 32 (54.20%) and the right 27 (45.7%) students. The first degree of lowering of the left foot is present in 16 (27.1%) and the right in 20 (33.90%) students. Slightly more severe, the second degree of lowering of the left foot was found in 7 (11.9%) and the right in 6 (10.2%) students. Few students of this school have poor foot status, the third degree of lowering of the left 4 (6.8%), and the right 6 (10.2%) of the total sample of students.

Table 1. Analysis of the feet of students of OS "M. Rakić"

Assessment scale	Students of the elementary school "M. Rakić" Urban (N = 35)				Students of the elementary school "M. Rakić" Urban (N = 24)			
	left foot		right foot		left foot		right foot	
	N	%	N	%	N	%	N	%
Normal	18	51.4	17	48.6	14	58.3	10	41.7
I	10	28.5	11	31.2	6	25	9	37.5

II	3	8.6	3	8.6	4	16.7	3	12.5
III	4	11.5	4	11.5	-	-	2	8.3

If we compare the status of the feet of boys from both schools, we see that the boys from Kneževo Elementary School "Dositej Obradović" have slightly better results, but they are not statistically significant. They have a small advantage in terms of the presence of a good foot as well as slightly less present students with impaired foot status.

Balanced development of children requires the cooperation of all those involved in the process of a child's growing up [15,24]. It is important that parents and teachers are providing education as well as doctors communicate well [24]. Everyone should know about the child's medical problem, and everyone should use their expertise to contribute to maintaining and establishing the optimal health of the child.

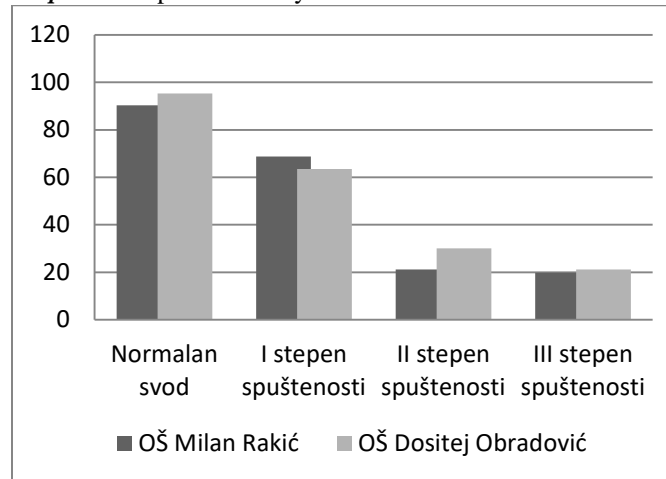
Table 2. Analysis of the feet of students of OS "Dositej Obradović"

Assessment scale	Students of the elementary school "D. Obradović" Rural (N = 41)				Students of the elementary school "Dositej Obradović" Rural t (N = 26)			
	left foot		right foot		left foot		right foot	
	N	%	N	%	N	%	N	%
Normal	18	51.4	17	48.6	15	57.7	14	53.8
I	10	28.5	11	31.2	7	26.9	7	26.9
II	3	8.6	3	8.6	4	15.4	4	15.4
III	4	11.5	4	11.5	-	-	1	3.8

The results of the analysis of the feet of the students of the elementary school "Dositej Obradović" are as follows: normal left foot is present in 34 (50.7%) and right foot in 31 (46.3%) students. Somewhat impaired status of the left foot was found in 18 (26.9%) and the right in 22 (32.8%) students. The second degree of lowering is present in 10 (14.9%) students, while the third degree of lowering is present in only 4 (6%) and right in 5 (7.5%) students of this school.

This period of accelerated growth, which is often uneven because there is an elongation of the extremities, ie. bone growth but lagging muscle strength. Then there is a stretching of muscle fibers and in addition weakened and binding elements due to the action of hormones. This is a critical period for the development of deformities because there is an imbalance between the load and the ability of the supporting tissue of the foot to accept the mentioned load. Both schools have very well-equipped gyms and the students attend physical education classes in very good conditions. Preservation of longitudinal and transverse arches depends on the structure of bones, foot ligaments and lower extremities and leg muscles [16]. On the onset of puberty the foot reaches 97% of its optimal length. Late ossification of the tarsal bones results in foot flexibility in the first year, which is a favorable biomechanical basis for the conservative treatment of congenital foot deformities [5,10].

By overprotecting children, we eliminate opportunities to gain a variety of life experiences and limit proportionate growth and development as well as strengthening their bodies. Children should be allowed and allowed to crawling, jumping, climbing and perform various movements and movements, because in this way they gain various experiences and motor skills. In this way, children will develop their motor skills, which is an important contribution to the development of the locomotor system, as well as the feet, which are the main mechanism for movement and the only contact part of the body with the ground [3].

Graph 1. Comparative analysis of feet between schools on the whole sample

On the chart, we can clearly see that the presence of deformities is more present in children in urban areas, except for second-degree depressions, which we can justify by using bad shoes. If we allow children to satisfy their needs for movement, we will enable them to develop strength, coordination of movements, balance and other skills.

All physical education teachers, parents and the involvement of medical workers must be a compact team and regularly monitor the child's condition, because only in this way will they contribute to a preventive and timely solution to the problem.

4. CONCLUSION

The unfavorable influences of civilization are reflected on the foot. Subjective and objective disorders in young people with a lowered arch of the foot become more pronounced over time. This reduces the ability to work and live. For these reasons, it is necessary to create an effective system of preventive in young children both for the whole body and for the foot. According to the obtained results, set goals and hypotheses, the following conclusions can be drawn: research has shown that a large number of primary school children in rural areas do not have impaired foot status; by comparing the results of the confirmation. The hypothesis is that rural children have better foot status than urban children.

During the implementation of this research, there was great interest among students and teachers about the results of the same, so the results will be handed over to schools in the foreseeable future.

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