

Pain associated with the musculoskeletal system in children from Warsaw schools

Iwona Słowińska¹, Małgorzata Kwiatkowska², Ewa Jednacz², Małgorzata Mańczak³, Lidia Rutkowska-Sak², Filip Raciborski^{3,4}

¹Department of Rheumoorthopedic Surgery, Institute of Rheumatology, Warsaw, Poland

²Department and Polyclinic of Developmental Age Rheumatology, Institute of Rheumatology, Warsaw, Poland

³Department of Epidemiology and Health Promotion, Institute of Rheumatology, Warsaw, Poland

⁴Department of Prevention of Environmental Hazards and Allergology, Medical University of Warsaw, Warsaw, Poland

Abstract

Objective: To assess the prevalence of pain in the musculoskeletal system and possible reasons for these complaints among early age children from Warsaw schools.

Material and methods: The study was conducted in 34 randomly selected primary schools in Warsaw in 2011. 2748 survey-questionnaires were given to parents or legal guardians by children. Of these, 1509 surveys were subject to a final analysis. The survey included 66 questions regarding, among other things, pain in the musculoskeletal system in children. Additionally, there were questions about possibly occurring diseases, any postural defects, significant obesity, as well as effects of these complaints on the child's physical activity. Survey data regarded 6–7-year-old children.

Results: In the group of 1509 respondents, 242 children (16%) complained about pain in the musculoskeletal system. Pain was located most frequently in the knee joints, and more rarely in the spine and joints in the upper extremities. In the group of children who complained about pain, moderate physical activity was statistically significantly limited. According to parents, physicians did not diagnose any medical conditions in 106 children. Joint disease was diagnosed in 33 children. Postural defects were diagnosed in 589 children. In 123 children complaining about pain at least one postural defect was diagnosed. Such defects were diagnosed statistically significantly more rarely ($p = 0.011$) in 1234 children who did not complain about pain (460 children). Platypodia or other foot deformation was observed in 25% of these children, spinal curvature in 12%, abnormal knee joint position in 11% and uneven hip position in 2% children. Of note, 17% of all children were significantly overweight. In overweight children the prevalence of pain, especially in the knee joints and feet, was significantly higher.

Conclusions: This study aims to underline the problem of musculoskeletal pain in early-age children which limits their physical activity. Also the authors draw attention to the issue of postural defects in a large group of school children. This issue undoubtedly requires more attention and a plan how to create more effective methods of prevention.

Key words: pain, musculoskeletal system, children, schools.

Introduction

Pain in the musculoskeletal system in children may be so-called “growth pain”, symptoms of overload, also associated with postural defects, as well as manifesta-

tion of various diseases. They always raise some anxiety in the child's parents or guardians.

This study aimed to assess the prevalence of pain in the musculoskeletal system and possible reasons for the complaints among early school-age children in Warsaw.

Address for correspondence:

Lidia Rutkowska-Sak, Department and Polyclinic of Developmental Age Rheumatology, Institute of Rheumatology, Spartanska 1, 02-637 Warsaw, Poland, e-mail: lidia.rutkowska@ir.ids.pl

Submitted: 15.05.2015; Accepted: 15.05.2015

Material and methods

The study was conducted in the Department of Public Health, Warsaw Medical University in cooperation with the Institute of Rheumatology, Warsaw in 2011.

It was a survey-based study performed in 34 randomly selected primary schools in Warsaw. 2748 survey-questionnaires were given to parents or legal guardians by children. Of these, 1600 surveys were received back. Not all of them were filled in completely. Only 1509 surveys were subject to a final analysis.

The survey included 66 questions regarding, among other things, pain in the musculoskeletal system in children. The questions regarded the prevalence, location and intensity of complaints. Additionally, there were questions about possible reasons for such complaints, possibly occurring diseases, any postural defects, significant obesity, as well as effects of these complaints on the child's physical activity.

The study was approved by the Bioethics Committee of the Institute of Rheumatology. The majority, i.e. 86%, of surveys were filled in by mothers. The mean age of respondents was 36.7 years (SD = 4.9). Notably, 89% of mothers had secondary or higher education.

The examination included all children of the first classes in randomly selected schools.

In 74% survey data regarded 7-year-old children (year of birth 2003), in 24% 6-year-old children (year of birth 2004) and in 2% older children (year of birth 2000–2002). In the study group girls accounted for 52%.

As the study regarding pain in the musculoskeletal system in children was only a subjective study, the pain character was assessed indirectly based on the child's ability to engage in physical activity and based on the parents'/guardians' knowledge. The following criteria of

physical activity were accepted for the purposes of this survey:

- intense – e.g. jogging or other sports with intense physical effort,
- moderate – e.g. recreational cycling, fast walking.

Other criteria were specified in questions regarding limitations in performing the following activities:

- lifting and wearing a backpack/satchel,
- flexing and bending,
- going up the stairs (one floor, several floors),
- short or long walk (from 100 m to several km),
- independence with regard to washing and getting dressed.

Frequent pain was regarded as pain felt 2–3 times a week, while sporadic pain was pain felt once a week or less frequently.

A statistical analysis was performed with the Statistica 9.0 software. The χ^2 test was used to test whether differences between groups of children with and without pain were statistically significant. The value of $p \leq 0.05$ was assumed to be statistically significant.

Results

In the group of 1509 respondents 242 children (16%) complained of pain in the musculoskeletal system. Figure 1 presents the location of pain and its frequency.

Frequent pain was located in the knee joints, and sporadic pain in the spine and joints in the upper extremities. In 39 subjects (16%) joint swelling was sporadically observed and it was not associated with physical effort or infection. In the group of children who complained of pain, moderate physical activity was statistically significantly limited, which is presented in Figs. 2 and 3.

Due to pain 22 children (9%) sometimes missed school. Parents/guardians consulted a GP or pediatrician in the case of 120 children (50%) in the group complaining of pain, an orthopedician in the case of 99 subjects (41%) and a rheumatologist in the case of 12 subjects (5%). According to parents, physicians did not diagnose any medical conditions in 106 children (43.8%), unspecific joint disease was found in 20 of this group (8.3%), degenerative joint disease in 7 children (2.9%), juvenile idiopathic arthritis in 5 children (2.1%), and osteoporosis in 1 child (0.4%). In 21 children (8.7%) the diagnostic process is still ongoing. In the remaining children only postural defects were diagnosed.

Postural defects were diagnosed in 589 children. In 123 (51%) children complaining about pain at least one postural defect was diagnosed. Postural defects were also identified in the group of 1,234 children without pain.

With regard to postural defects platypodia or other foot deformation was diagnosed in 25% of children,

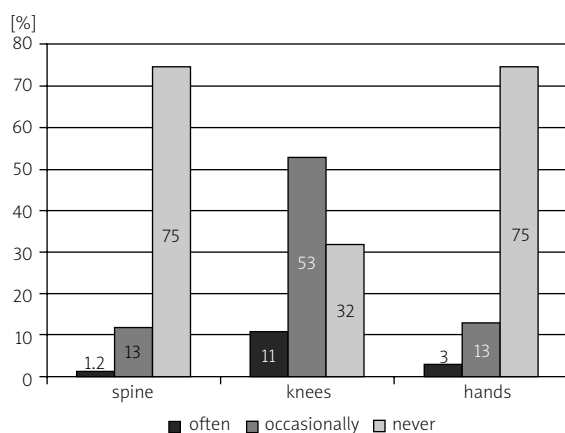


Fig. 1. Location of pain in the locomotor system in the studied children.

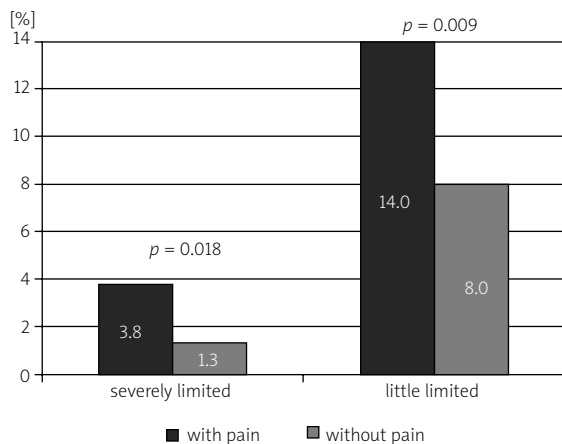


Fig. 2. Intense motor activity in children.

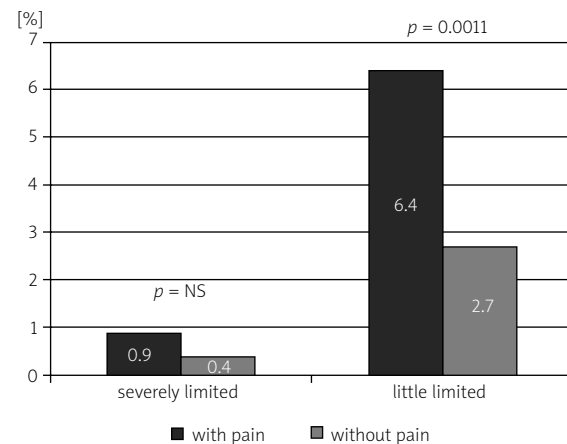


Fig. 3. Moderate motor activity in children (cycling, fast walking).

spinal curvature in 12%, abnormal knee joint position in 11% and uneven hip position in 2% children.

There were no differences with regard to motor activity in the group of children with and without postural defects ($\chi^2 = 0.21$, $p = 0.8973$).

17% of all children were significantly overweight (above the 90th centile) and 4% of all children were significantly underweight (below the 10th centile). In overweight children the occurrence of pain, especially in the knee joints and feet, was significantly higher.

Based on respondents' declarations, it can also be concluded that parents/guardians of children complaining about pain in the musculoskeletal system ($p = 0.0005$) also complained about similar pain in their surveys and it was statistically significant.

It was found that 31.4% of children experiencing pain were receiving rehabilitation treatment. Children with postural defects who did not complain about pain in the musculoskeletal system also received rehabilitation treatment, but statistically significantly more rarely ($p = 0.0004$).

Discussion

It was possible to analyze answers obtained thanks to a high response rate (55%) to questionnaires. According to studies conducted by the Institute of Rheumatology 16 years earlier back pain among children from Warsaw primary schools was objectively described in 10% of children. The mean age was 11 years. The rate of complaints increased with age and in secondary school students in Warsaw it was as high as 26.7% [1]. In our study back pain was reported by 2% of respondents. Children's mean age was 6.7 years. Despite different study methods both studies confirm that increase of the number of cases of back pain is associated with the increase of

the age of children and sedentary lifestyle. In secondary school students this rate was 26.7% in our earlier study.

Many authors indicate negative effects of wearing a backpack that is too heavy, and search for preventive measures [2, 3].

Postural defects were observed in 51% of children with pain and in 40% of all children. We do not know how these defects are correlated with these complaints, because based on questionnaires it was not possible to find out whether they were the only reasons for complaints. In some children it is possible to draw only indirect conclusions. Postural defects were observed in a group of children without pain statistically significantly more rarely. It is worth noting that in the early school period a change in a lifestyle from free behavior to the obligation of spending several hours at a school desk and wearing a backpack may lead to deterioration of the child's body posture. This topic has been discussed in many literature reports [4–6]. Based on objective studies some authors report that postural defects in 7-year-old children are observed even in 90% [7]. It is worth noting that despite more frequent pain among children with postural defects there were no differences with regard to the motor activity between children with and without postural defects [8].

In the surveyed group of children the most common postural defects included defects of the feet, knee joints and spine. In the majority of children with pain the knee joints were affected. It cannot be excluded that some of these complaints were caused by disturbed body statics due to a forced sitting position and overload with a heavy backpack in the early school period.

Moreover, it was beneficial to observe that the majority of children diagnosed with a postural defect or joint disease received rehabilitation regardless of their pain.

Based on numerous literature reports it can be concluded that in overweight children there is higher prevalence of pain in the spine and knee joints. Therefore this aspect cannot be omitted in an analysis of pain complaints in children who were surveyed [9, 10].

Conclusions

This study aimed to highlight the problem of a large group of early school age children with pain in the musculoskeletal system that may limit their physical activity. Also the large group of children with postural defects requires special attention [8, 11, 12]. Other determinants of pain of the musculoskeletal system in children from Warsaw schools arising from this research will be presented in future studies.

The authors declare no conflict of interest.

The study was supported by a research grant from the Medical University of Warsaw.

References

1. Romicka AM, Moskalewicz B, Goryński P, et al. Dysfunctions of the Musculoskeletal System in School children, Epidemiological Assessment. *Pol J Environ Stud* 2006; 15: 274-275.
2. Trevelyan FC, Legg SJ. Back pain in school children – Where to from here? *Appl Ergon* 2006; 37: 45-54.
3. Kjaer P, Wedderkopp N, Korsholm L, Lenouef-Yde Ch. Prevalence and tracking of back pain from childhood to adolescence. *BMC Musculoskel Dis* 2011; 12: 98-108.
4. Kaczmarek A, Żołyński K, Markuszewski I i wsp. Ocena porównawcza rozwoju fizycznego wybranych szkół wiejskich i miejskich województwa warmińsko-mazurskiego. *Kwart Ortop* 2005; 2: 110-116.
5. Niedzielski K. Epidemiologia stóp płasko koślawych statycznych u dzieci w aglomeracji łódzkiej. *Chir Narz Ruchu Ortop Pol* 1992; 57: 13.
6. Widłak P. Ocena prawidłowej postawy ciała i częstości występowania wad postawy oraz aktywności fizycznej u uczniów szkół podstawowych ze środowiska miejskiego i wiejskiego Kielc i okolic. *Rozprawa doktorska, UM Łódź* 2010.
7. Olszewski J, Kuśmierczyk R, Olszewska M. Porównawcza ocena występowania wad postawy u siedmiolatków i czternastolatków. *Kwart Ortop* 2007; 3: 331-341.
8. Mańczak M, Raciborski F. Uwarunkowania aktywności fizycznej warszawskich dzieci z pierwszych klas szkoły podstawowej. *Probl Hig Epidemiol* 2013; 94: 79-85.
9. Maciączyk-Paproska K. Epidemiologia wad postawy u dzieci i młodzieży. *Praca doktorska, Poznań* 2013, www.wbc.poznan.pl/Content/289363.
10. de Sa Pinto AL, de Barros Holanda PM, Radu AS, et al. Musculoskeletal findings in obese children. *J Paediatr Child Health* 2006; 42: 341-344.
11. Bron DCS. Arthrologia in children. *Can Fam Physician* 1983; 29: 2149-2151.
12. Kontny E, Kwiatkowska M, Kołodziejczyk B i wsp. Cytokiny prozapalne u dzieci z bólem stawów niewyjaśnionego pochodzenia oraz chorych na młodzieńcze idiopatyczne zapalenie stawów. *Reumatologia* 2010; 48: 301-306.