Low back pain in school-age children: risk factors, clinical features and diagnostic managment

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Abstract

Purpose: Low back pain (LBP) is common in adult population, and it is becoming a serious health concern in adolescents. On surveys, about every fifth child in the school-age reports LBP. The study objective was to analysis the natural history, risk factors, clinical symptoms, causes and diagnostic management in school-age children hospitalized with LBP.

Material and methods: The study group consisted of 36 patients at the age between 10 and 18 years, 22 girls and 14 boys suffering from LBP hospitalized in our Department of Pediatric Neurology and Rehabilitation in years 2000-2004.

Results: The mean age of clinical onset of LBP in our group was 14.7 years, earlier in girls, later in boys. We find the family history of LBP in 50% children. Most frequent factors associated with LBP were: spina bifida (16.7%) and incorrect posture (13.9%). Half of patients pointed the factor initialising LBP: rapid, incoordinated move (39%) or heavy load rise (11%). 58% of patients present the symptoms of ischialgia. Diagnostic imaging showed disc protrusion in 11 children (31%) 6 in computed tomography, 4 in magnetic resonance imaging and 1 in X-Ray examination only. Other causes of LBP included: spondylolysis in 2 patients, Scheuermann disease in one case and juvenile reumatoid arthritis in one case.

Conclusions: Some school-age children suffering on low back pain, particulary with sciatic neuralgia symptoms seek medical care in hospital. Althought the main causes are mechanical, associated with lack of physical activity or strenous exercise, serious diagnostic managment is strongly recommended.

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Introduction

Low back pain (LBP) is common in adult population, and it is becoming a serious health concern in children and adolescents. LBP has a relatively high prevalence during school ages.

On surveys, nonspecific LBP in children is nearly as common as in adults. The cummulative annual prevalence of LBP in 14-year old French schoolchildren was 82.9% with reporting 57.7% reporting recurrent pain and 8.9% chronic pain [1]. The annual prevalence of LBP in 5 000 iranian children aged 11- and 14-years was 17.4% [2]. Twenty-two percent of english schoolchildren and 18% of finnish among 14- and 16-year-old adolescents reported having LBP [3,4]. Back pain with non-organic cause in children has many biomechanical, neurophysiological and psychosocial determinants associated with age, sex, health state, genetic and socioeconomic factors, physical activity and lifestyle [5]. However, only a minority of the children suffering from LBP seek medical attention. A need for a physician visit was reported in 18.7% of cases only [1]. Even more rarely diagnostic managment is performed. The most common serious causes of LBP in children include spondylolysis or spondylolisthesis, Scheuermann disease, musculoligamentous injury, lumbar disc herniation and neoplasms [6-9].

Therefore, our study objective was to evaluate the natural history, risk factors, diagnostic imaging, causes, symptoms and therapeutic management in school-age children suffering from serious LBP, seeking medical care in hospital.

Material and methods

The study group consisted of 36 patients aged between 10 and 18 years suffering from LBP, hospitalized in our Depart-

ment of Pediatric Neurology and Rehabilitation in years 2000--2004. In this study we review all clinical data of these subjects including natural history, medical examinations, ymptoms, risk factors, spine imaging results, diagnostic managment.

Results

There were 22 girls (61%) and 14 boys (39%) in this group. The mean age of clinical onset of LBP in our group was 14.7 years. The peak of prevalence was earlier in girls – 15 years, later in boys – 17 years. Eighteen (50%) children reported the LBP in family history. Most frequent factor associated with LBP was incorrect posture in 5 children (13.9%), particulary sitting position. Eighteen patients (50%) pointed the factor initialising LBP: rapid, incoordinated move 14 (39%) or heavy load rise 4 (11%) adolescents.

In 15 of these cases (42%) the beginning of LBP was associated with strenous excercise like dance and sport training. 21 patients (58%) present the symptoms of ischialgia. Almost 42% (15 patients) of our group presents the symptoms LBP only, 6% (2 children) sciatic neuralgia only and in 52% cases (19 patients) main complain were complex symptoms of LBP and sciatica. If we analysed factors which induced the onset of LBP separately for sciatica and back pain only, we didn't find significant difference. All patients underwent detailed pediatric and neurological examination. Plain radiographs of the lumbar spine were performed in all patients. The lumbar spine was assesed by magnetic resonance imaging (MRI) or computed tomography (CT) in all patients with sciatica symptoms and chronic LBP. Diagnostic imaging showed disc protrusion in 11 children (31%): 6 in computed tomography, 4 in magnetic resonance imaging and 1 in X-Ray examination only. Plain radiographs performed in all 36 patients show spina bifida in 6 cases (16.7%). Other causes of LBP included: spondylolysis in 2 patients, Scheuerman disease in one case and juvenile reumatoid arthritis in one case. The level of disc changes was determined in L4/L5 in 4 adolescents, L5/S1 – 6 patients and one case of disc herniation in two levels: L4/L5 and L5/S1.

Discussion

The data from literature, concerning gender differences and peak age of the prevalence of LBP have been partly controversial. The prevalence of back pain was low among the 7-years-old (1%) and 10-years-old (6%) schoolchildren, but increased with age, being 18% both among 14- and 16-year-old adolescents [4]. In other studies LBP was also significantly correlated with age [2]. In our study, the peak age of clinical onset of LBP in our group was 14.7 years, however, earlier in girls (15 years), later in boys (17 years). Moreover, 61% patients hospitalized with LBP were girls. Female gender was associated with current back pain [1], but in more studies no gender difference have been found [2,4,8]. We found the family history of LBP in 50% children. Some authors reported family history of LBP [3], but other not [10,11]. It seems depend on psychosocial factors, like lifestyle and physical activity in different populations. Significant risk factor are postural abnormalities. We confirmed incorrect posture in 13.9% patients of our group. The system of postural reflex control reaches maturity at 18-21 years age. That is why adolescents are not aware of postural abnormality [5]. So both lack of physical activity and strenuous excercise are significant risk factors for LBP [5]. Very important questions should be asked about the mechanisms of oneset and exacerbating factors. Half of our patients pointed the factor inducing LBP: rapid incoordinate move (39%) or heavy load rise (11%). Althougt most of the painful injuries that children sustain in recreational activities are mild, low back pain that lasts for extended periods may be due to various disorders, including spondylolysis and spondylolisthessis, dics herniation, Scheuermann disease, or neoplasms [7]. Almost 42% patients of our group presents the symtptoms LBP only, 6% sciatica only and in 52% main complain were symptoms of LBP and sciatica. The classic clinical onset in the children with herniated discs started with LBP and sciatica, as in the children with neoplasms, althought in this group leg pain to be bilateral [8]. If we analysed factors which induced the onset of LBP separately for sciatica and back pain only, we didn't find significant difference.

Plain radiographs of the pediatric spine showed that X-Ray examination is still a valuable diagnostic tool and it is standard in diagnostic procedure in patients with LBP [12]. However, plain radiography is better for diagnosing spinal growths compared with their scant utility in disc herniations [8]. This examination, performed in all our patients with LBP showed spina bifida in 6 patients, spondylolysis in 2 patients and one disc herniation only. We confiremed also X-Ray features of Scheuermann disease in one case and juvenile reumatoid arthritis in one case. A specific cause of LBP in children is often identified by CT and MRI [12,13]. MRI showed promising results in detecting and monitoring the early onset spondylolysis in children and adolescents, even with normal plain radiographs [14]. Spondylolysis and spondylolisthesis are the most common causes of chronic LBP in children [13]. Lumbar disc herniation is uncommon in adolescents and even more rarely surgical treatment is necessary in such cases [15]. Disc protrusion is prevalent in young athlets [13]. In our material, diagnostic imaging showed disc protrusion in 11 children (31%): 6 in CT, 4 in MRI and 1 in plain radiographs only. MRI fatures of disc protrusions in adults are good known and could be powerful predictors of surgical outcome [16,17]. However, very little is known about the distribution of of lumbar MRI findings and how they are associated with LBP in youngsters. In cross-sectional cohort study of 13-years-old children with LBP, signs of disc degeneration were noted in approximately 1/3 of the subjects [18], similar like in our study. Moreover, there were obvious differences between genders: degenerative disc changes in the upper lumbar spine were more strongly associated with LBP in boys, while disc abnormalities in the lower lumbar spine were associated with seeking care in girls [18]. In our material disc changes were found in the lower lumbar spine: L5/S1 – 6 cases, L4/L5 – 4 cases and in 3 cases degenerative changes were placed in 2 levels: L4/L5 and L5/S1. CT seems to be less useful in diagnostic managenent of LBP [12]. CT scans were done in our study because the restricted availability of MRI in our region in the past. Hovewer, in seven performed CT we find disc herniation

in 6 cases. It could depend on good selection to imaging diagnostic. All these patients demonstrated ischialgia symptoms.

Conclusions

Half of our patients pointed the factor initialising LBP: rapid, incoordinated move or heavy load rise. We confirmed incorrect posture in 13.9% patients of our group. 58% adolescents with LBP have the symptoms of ischialgia. Diagnostic imaging showed disc protrusion in 31 % children. Other causes of LBP included: spondylolysis, Scheuermann disease and juvenile reumatoid arthritis. Some school-age children suffering on low back pain, particulary with sciatic neuralgia symptoms seek medical care in hospital. Althought the main causes are mechanical and developmental, associated with lack of physical activity or strenous exercise, serious diagnostic managment is strongly recommended. The most valuable diagnostic tool is magnetic resonance imaging. This procedure should be standard in diagnostic managment in adolescents with LBP.

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