

Back Pain in Adolescent with Idiopathic Scoliosis

Ból pleców u młodzieży ze skoliozą idiopatyczną

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ABSTRACT

INTRODUCTION

Idiopathic scoliosis (IS) is referred as a cause of a back pain in adults, probably on the basis of spinal overload and degeneration. Back pain in children and youths has been assessed only occasionally. The aim of the study was to determine the occurrence of back pain in adolescent with IS.

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MATERIAL AND METHODS

Poll assessment and medical documentation analysis of 70 patients (65F and 5M) with IS was conducted. Mean age was 15 years (SD = 1.7), mean value of body mass index (BMI) was 18.7 (SD = 2.3), mean Cobb angle 26.4° (SD = 13.8), apical vertebra rotation (AVR) 13.4° (SD = 8.2), thoracic kyphosis 26.1° (SD = 12.2), lumbar lordosis 33° (SD = 9.4) lower limbs discrepancy 0.29 cm (SD = 0.64). Intensity of back pain was evaluated by visual analogue scale (VAS).

RESULTS

Back pain was present in 2/3 of subjects (65.7%). Intensity of pain was 1–7 points of VAS (mean 3.3, SD = 1.6). Pain arose usually in static positions. Cobb angle correlated positively with intensity of pain, reaching level of statistical significance ($r = 0.24$, $p < 0.05$). No significant correlation between AVR and pain severity was also observed ($r = 0.13$, $p > 0.05$), as well as between BMI and pain ($r = 0.2$, $p > 0.05$). Thoracic kyphosis ($r = -0.2$, $p > 0.05$), lumbar lordosis ($r = -0.21$, $p > 0.05$) and abbreviation of lower limb ($r = -0.19$, $p > 0.05$) revealed negative, insignificant correlation with intensity of pain.

CONCLUSIONS

Back pain occurs commonly in youths with idiopathic scoliosis. Statistically significant positive relation between severity of back pain and Cobb angle was observed. Patients with IS and back pain should be diagnosed against other possible spine pathology.

KEY WORDS

idiopathic scoliosis, back pain, youths

ADRES

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STRESZCZENIE

WSTĘP

Skolioza idiopatyczna (IS) jest częstą przyczyną występowania dolegliwości bólowych w dojrzałym wieku, prawdopodobnie na tle zmian przeciążeniowych oraz zwyrodnieniowych. Bóle grzbietu u dzieci i młodzieży znacznie rzadziej są przedmiotem badań. Celem pracy było określenie częstości występowania bólów grzbietu u młodzieży z IS.

MATERIAŁ I METODY

Przeprowadzono badanie ankietowe i poddano analizie dokumentację medyczną 70 pacjentów z IS (65 K i 5 M). Średnia wieku wyniosła 15 lat (SD = 1,7), średnia wartość wskaźnika masy ciała (BMI) 18,7 (SD = 2,3), kąta skrzywienia według Cobba 26,4° (SD = 13,8), kąta rotacji radiologicznej kręgu szczytowego (AVR) 13,4° (SD = 8,2), kifozy piersiowej 26,1° (SD = 12,2), lordozy lędźwiowej 33° (SD = 9,4), różnica długości czynnościowej kończyn dolnych 0,29 cm (SD = 0,64). Stopień nasilenia dolegliwości bólowych grzbietu określono za pomocą wzrokowej skali analogowej (VAS).

WYNIKI

Bóle grzbietu występowały u 2/3 badanych (65,7%). Stopień nasilenia bólu wahał się w zakresie 1–7 pkt VAS (średnio 3,3, SD = 1,6). Ból występował zwykle w pozycjach statycznych. Wielkość kąta Cobba korelowała dodatnio z nasileniem bólu, osiągając poziom istotności statystycznej ($r = 0,24$, $p < 0,05$). Zaobserwowano także słabą, nieistotną statystycznie korelację pomiędzy wielkością AVR i nasileniem dolegliwości bólowych ($r = 0,13$, $p > 0,05$) oraz BMI i nasileniem dolegliwości ($r = 0,2$, $p > 0,05$). Wartości kifozy piersiowej ($r = -0,2$, $p > 0,05$), lordozy lędźwiowej ($r = -0,21$, $p > 0,05$) oraz skrótu kończyny dolnej ($r = -0,19$, $p > 0,05$) korelowały słabo ujemnie z nasileniem dolegliwości bólowych, również nie osiągając poziomu istotności statystycznej.

WNIOSKI

Dolegliwości bólowe grzbietu występują powszechnie wśród młodzieży z skoliozą idiopatyczną. Zaobserwowano istotną statystycznie zależność między nasileniem dolegliwości bólowych grzbietu a wielkością kąta Cobba. Pacjenci ze skoliozą idiopatyczną i bólem pleców powinni podlegać dalszej diagnostyce w celu wykluczenia innych przyczyn dolegliwości.

SŁOWA KLUCZOWE:

skolioza idiopatyczna, ból pleców, młodzież

INTRODUCTION

Idiopathic scoliosis is referred as a cause of a back pain in adults, probably on the basis of spinal overload and degeneration. The whole problem of a back pain in children and youths was assessed only occasionally and had been neglected until last two decades [1]. There is still no general agreement about idiopathic scoliosis as a cause of a back pain in the developmental age [1]. The purpose of the study was to determine the occurrence of

the back pain in adolescent with idiopathic scoliosis.

MATERIAL AND METHOD

The study group included 70 patients (65F and 5M) of Department of Rehabilitation, Medical Centre of Silesia, selected by chance. Poll assessment with a proprietary, anonymous questionnaire and medical documentation analysis were conducted.

Mean age of researched group was 15 years (range 12–18, SD = 1.7), mean value of body mass index (BMI) was 18.7 (range 14.5–25.8, SD = 2.3). Mean Cobb angle was 26.4° (range 10–78, SD = 13.8), mean apical vertebra rotation (AVR) was 13.4° (range 2–38, SD = 8.2). In the sagittal plane, mean angle of thoracic kyphosis was 26.1° (range 0–70, SD = 12.2) and mean angle of lumbar lordosis was 33° (range 2–58, SD = 9.4). Mean discrepancy of length of lower extremities was 0.29 cm with median value of 0.0 (range 0–4.5, SD = 0.64). Intensity of back pain was evaluated by visual analogue scale (VAS). Results were collected in digital form in Microsoft Excel spreadsheet and further analysed statistically in StatSoft Statistica software to determine data correlation.

points of VAS (mean 3.3, SD = 1.6) – results are presented on figure 1. Pain arose usually in static positions (81.4% of subjects with pain), but also occurred frequently during physical activity (63%).

RELATIONSHIP OF MORPHOLOGY OF THE SCOLIOSIS TO THE BACK PAIN

Cobb angle value correlated positively with intensity of pain, reaching level of statistical significance (Pearson’s coefficient $r = 0.24$, $p < 0.05$). No significant correlation between angle of apical vertebra rotation and severity of pain was observed ($r = 0.13$, $p > 0.05$). Results are presented on figure 2.

DISCREPANCY OF LOWER LIMBS LENGTH AND THE BACK PAIN

Analysis of a discrepancy of lower limbs length ($r = -0.19$, $p > 0.05$) showed weak, negative, insignificant correlation with severity of pain (fig. 2).

SAGITTAL PLANE IMPORTANCE IN THE BACK PAIN

Thoracic kyphosis ($r = -0.2$, $p > 0.05$) and lumbar lordosis ($r = -0.21$, $p > 0.05$) revealed nega-

RESULTS

THE OCCURRENCE AND INTENSITY OF THE BACK PAIN

Back pain was present in nearly 2/3 of subjects (67.7%). Intensity of pain ranged from 1 to 7

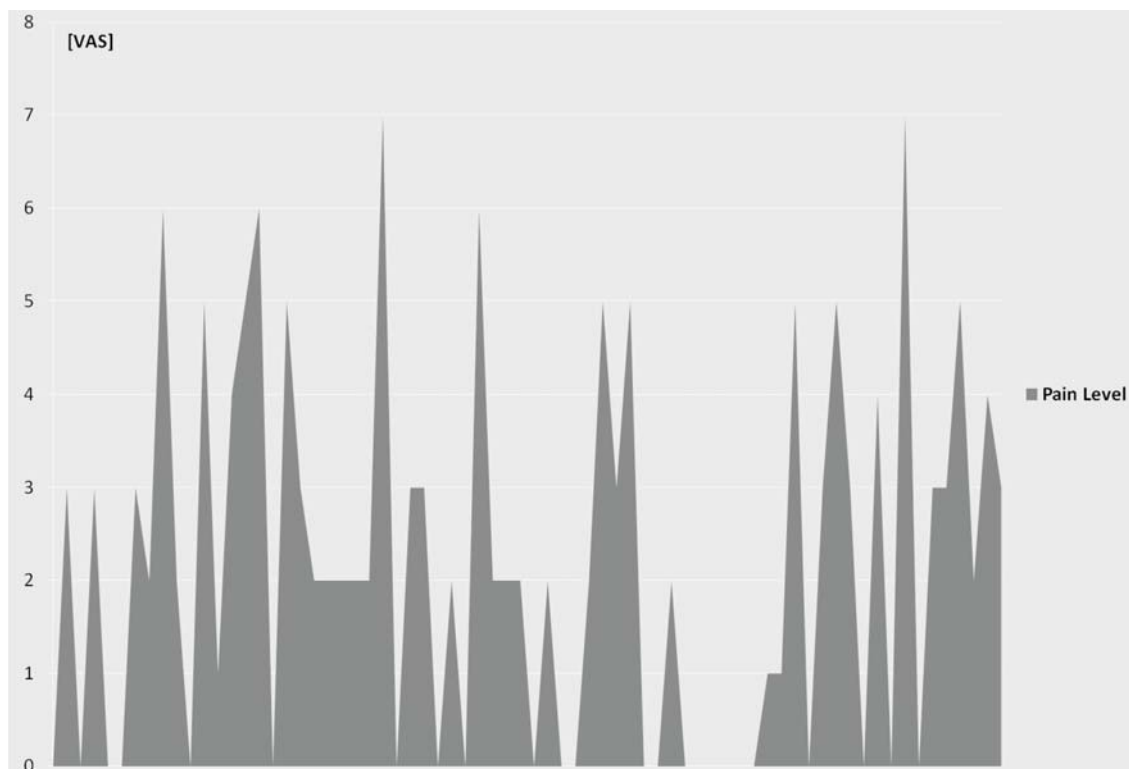


Fig. 1. Results – intensity of the back pain on the basis of Visual Analogue Scale (VAS).

Ryc. 1. Wyniki – poziom natężenia dolegliwości bólowych podawany przez poszczególnych badanych wg skali bólu (10-stopniowa skala wizualno-analogowa).

tive, insignificant correlation with intensity of pain (fig. 2). This incidence is higher than reported from

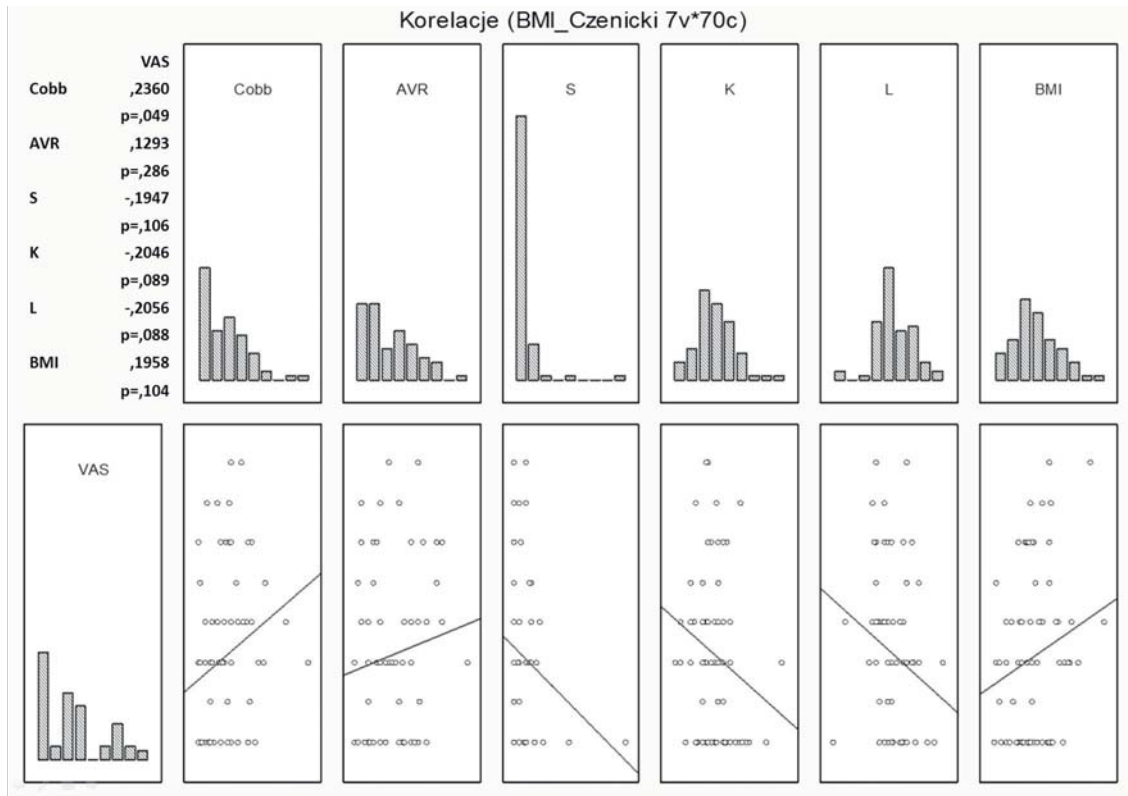


Fig. 2. Results – analysis of correlation with VAS. Cobb – Cobb angle; AVR – apical vertebra rotation; S – lower limbs length discrepancy; K – thoracic kyphosis; L – lumbar lordosis; BMI – body mass index.

Ryc. 2. Wyniki – korelacja między poziomem natężenia dolegliwości bólowych a wielkością: skrzywienia mierzoną metodą Cobba (Cobb); rotacji osiowej trzonów kręgów szczytowych (AVR); różnicy długości kończyn dolnych (S); kifozy piersiowej (K); lordozy lędźwiowej (L) i wskaźnika masy ciała (BMI).

BODY MASS INDEX AND THE BACK PAIN

Body mass and body height analysis revealed no significant correlation between BMI and pain severity ($r = 0.2, p > 0.05$) – see figure 2.

DISCUSSION

Back pain problem in children was out of the scope of medical research till early 1990's. Dobosiewicz in her monographic study describes, that back pain correlates with muscle tone imbalance, reduced spinal mobility and sitting position, particularly incorrect. There is no evidence of a relationship between excessive lumbar mobility nor overweight and a back pain in children [1].

In current study nearly 68% of examined children with scoliosis suffered from back pain of

other sources. Petersen et al. suggest, that the incidence of back pain in children in the USA is as high as 40% for single episode and 13% for recurrent pain [2]. Masiero et al. found, that 20.5% of examined teenagers had one or more episodes of low back pain [3]. Lebkowski stated low back pain in 60% of secondary school pupils [4].

Opinions about scoliosis as a cause of a back pain, especially in children, vary from source to source. Edgar in 1987 stated, that the incidence of back pain in fused and non-fused scoliotic patients in relation to the general population remains uncertain [5]. Ramirez et al. found 32% of children with idiopathic scoliosis suffering from back pain. The pain was significantly related to age of more than 15 years, skeletal maturity (Risser test of 2 or more), post-menarchal status and history of injury. There was no association with magni-

tude or type of curve, limb-length discrepancy nor spinal alignment. Authors emphasize, that 9% of back pain cases had an underlying pathology condition of spine other than scoliosis, and thus strongly advise an extensive diagnostics in cases of scoliosis and back pain [6].

Thus, there is still lack of clear evidence that the idiopathic scoliosis could be considered as a single reason for a back pain during maturation. Even in adults, scoliosis below 40° of Cobb angle should be painless [7].

Jackson et al. in their study suggest strong correlation of pain with scoliosis above 40° in adults [8]. Weinstein et al. reported, that 61% of patients with scoliosis, aged 54–80 years, suffered from little to moderate back pain, compared to 35% of controls [9]. Parsch et al. found, that a sport activity of scoliotic adults is limited in comparison with age-matched controls due to functional impairment and frequent back pain [10].

The relationship between Cobb angle, angle of apical vertebral rotation and intensity of

pain also remains unclear. Weiss et al. in an extensive study of over 2000 scoliotic patients with back pain reveals lack of correlation of pain intensity and curve magnitude [11]. On the contrary, Gremeaux et al. found, that the severity of a low back pain correlated well with Cobb angle, AVR and rotatoryolisthesis [12]. In current study only Cobb angle analysis revealed statistically significant correlation with intensity of a back pain.

CONCLUSIONS

1. Back pain occurs commonly in youths with idiopathic scoliosis.
2. Statistically significant positive relation between severity of back pain and Cobb angle was observed.
3. Patients with idiopathic scoliosis and back pain should be additionally diagnosed against possible underlying pathology other than scoliosis.

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