

Should the Improvement of Morphological Parameters be the only Aim of Treatment of Children with Idiopathic Scoliosis?

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Introduction

Scoliosis Research Society (SRS) defines structural scoliosis as a lateral curvature of the spine with rotational deformity and a curvature angle exceeding 10° according to Cobb [1]. In approx. 20% of cases, scoliosis is secondary to another pathological process. The remaining 80% are cases of Idiopathic Scoliosis (IS) [2,3]. Its frequency of occurrence constitutes approximately 1-3% of the population; mainly girls aged 10-16. The treatment of idiopathic scoliosis includes physiotherapy, brace treatment or surgical intervention [4].

The examination of a child with idiopathic scoliosis includes first of all a clinical and radiological examination [5]. The morphological parameters collected in this way are the most important but insufficient in evaluation of a child with IS [5,6]. Therefore, the examination should be supplemented by the evaluation of the function (e.g. the evaluation of cardiovascular system efficiency) and quality of life. It is particularly essential after exceeding the so called critical threshold of curvature angle (30°-50° by Cobb). In such a case there is an increased risk of a back pain in the adulthood, the disability becomes more visible and consequently the quality of life declines [6]. For that reason, the aim of treatment should not focus only on stopping the progression of the curvature but also on improving the aesthetics and physical fitness along with treating back pain [7].

In medicine the quality of life is understood as a functional effect of the disease and of its treatment experienced by the patient [8]. The quality of life is a complex notion consisting of various dimensions. One of them is the level of stress accompanying a given dysfunction. In the case of scoliosis, stress-inducing factors include deformities and asymmetries in body posture, lower physical performance and capacity as well as the type of method of treatment [9-12].

Assessment of the Quality of Life

In the literature there are numerous questionnaires assessing the quality of life which easily and objectively assess various matters connected with the disease, its treatment, self-image and the influence of the disease on interactions with the environment. Some of them, such as Brace Questionnaire (BrQ), Scoliosis Research Society Health-Related Quality of Life Questionnaire for Idiopathic Scoliosis (SRS-22 HRQL) or Bad Sobernheim Stress Questionnaire (BSSQ) are typical of patients with idiopathic scoliosis [11,13-17]. The majority of questionnaires designed for patients with IS were constructed in order to assess the final outcome of the therapy while the BSSQ assesses the level of stress in patients during their treatment [15,16].

The quality of life and the method used to treat patients with idiopathic scoliosis

A commonly applied method of conservative treatment of idiopathic scoliosis with the curvature angle of 25°-40° according to Cobb is bracing [6]. The influence of bracing on the quality of life of patients with idiopathic scoliosis has been studied many times; however, the presented results reveal a significant discrepancy [18].

Kotwicki et al. [15] observed the correlation of the treatment

method with the level of stress experienced by the patients. The researchers observed a significantly higher level of stress in patients treated with a brace and physiotherapy compared to girls treated with physiotherapy only. Moreover, patients treated with a brace demonstrated a higher level of stress when they replied to the questions in BSSQ-Brace than in the case of BSSQ-Deformity. These results make it possible to assume that the fact of having scoliosis itself is not a stress-inducing factor but the necessity to wear a brace. Similar results were obtained by Cheung et al. [14]. The quality of life was assessed by the researchers in two groups of patients with IS, one of which was treated with a brace, while the other one was under observation only. The obtained results revealed that patients treated with a brace had lower self-esteem and manifested a lower level of physical activity compared to their peers who did not wear a brace. The research carried out by Pham et al. [12] also suggests that the quality of life of patients with idiopathic scoliosis is related to the type of treatment applied. The results obtained by the researchers indicate that, except for one area concerning sleep disorders, the quality of life of patients wearing a brace both full time and only at night was lower than that of patients not treated with a brace. The research by Sapountzi-Krepia et al. [19] carried out on the basis of an interview questionnaire also revealed that 11 out of 12 patients treated with a brace experienced stress, fear, anger and shame. Different results were presented by Ugwonali et al. [18]. The comparison of the results of the questionnaire in the group of 78 patients treated with a brace and in the group of 136 children under observation only did not reveal statistically significant differences in any of the examined areas of the quality of life.

Kotwicki et al. [15] and Ugwonali et al. [18] assume that a lower level of the quality of life during brace treatment may only be temporary. It is possible that during treatment it is lowered but then it returns to normal. Danielsson et al. [20] assessed the quality of life of patients treated with a brace and those treated surgically 22 and 23 years after the end of the treatment, respectively. The results indicate the lack of correlation between the majority of aspects of the quality of life in patients and in the control group. However, differences in the field of physical activity, pain and general health were noted.

The quality of life and the number of hours a brace is worn per day

The conclusions of the researchers concerning the quality of life

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with reference to the number of hours a brace is worn per day are vary. Pham et al. [12] observed that patients treated with a brace full time (23 hours per day) experiences a lower quality of life than their peers using the brace at night only. Also Kotwicki et al. [15] observed that the level of stress increased with the rise in the number of hours a brace is worn. Its lowest level was noted in girls wearing a brace for 23 hours per day. However, these differences were not statistically significant. According to Misterska et al. [16], the level of stress does not correlate significantly with the number of hours a brace is worn per day.

The quality of life and Cobb's angle

The correlation between the quality of life and the angular size of the curvature according to Cobb is, as in the case of using a brace, an issue in which researchers obtain varied results. Kotwicki et al. [15] did not observe the correlation between the level of stress experienced by patients with IS and the size of an angle of primary curvature. Misterska et al. [9] and Botens-Helmus et al. [16] did not find any correlation between the level of stress and the size of Cobb's angle, either. Different results are presented by Cheung et al. [14], who found the correlation between the quality of life and the size of the spinal curvature, but only in the group of patients treated with a brace whose deformity was not higher than 20°. The researchers concluded that a lower quality of life may be connected with the difficulty to accept brace treatment in the case of slight deformities which, due to their progressive character, required such treatment. Interesting results were obtained by Ugwonalie et al. [18], who revealed the negative correlation between the curvature angle value and two areas of the quality of life, i.e. behaviour and expectations. On the other hand, the quality of life increased although the value of the curvature angle increased.

The quality of life and the other parameters of scoliosis

Such parameters of scoliosis as the location or the direction of the curvature, as well number of curvatures are perceived as factors which do not influence the quality of life of patients with IS [14,21,22]. Pham et al. [12] did not find a correlation between the quality of life and the level of osseous maturity according to Risser, regardless of the type of treatment applied. However, Misterska et al. [16] revealed that the level of stress increased together with the size of the apical vertebral rotation measured with Perdiolle's method. Kotwicki et al. [15] also found a significant correlation between the level of stress and the angle of trunk rotation measured with Bunnell's method. The existence of the correlation between these features may stem from the fact that the rotation of vertebrae brings about such consequences as rib hump and/or lumbar prominence and causes asymmetry in the pelvic area. It can be visible from the front while child watching itself in the mirror. Therefore, it may exert a direct influence on physical appearance.

The quality of life and physical activity

In the literature, there has been found only one publication concerning the relationship between the level of stress and physical activity. Leszczewska et al. [22] revealed that stress level in patients with IS decreased owing to higher level of physical activity. This observation is particularly essential in the context of the fact that children with idiopathic scoliosis are still excused from physical education classes and other forms of physical activity.

Conclusions

The aforementioned conclusions concerning the influence of

various variables on the quality of life of children with idiopathic scoliosis, despite being contradictory at times, prove the complexity of the phenomenon. Although it has not been determined which factors influence the lowering of the quality of life to the highest degree, the existence of such correlations must be highlighted and taken into consideration while planning the treatment of children with idiopathic scoliosis.

It is worth noting that, the efficiency and success of the rehabilitation process depend on the awareness, patience and self-discipline of the patient, and mainly on the acceptance of a particular form of therapy [9]. Therefore, the concentration of therapeutic effort only on the morphological aspect may lead to the limiting of the final outcome of the treatment. The combination of corrective actions (physiotherapy, brace, and surgery) with other areas of the functioning of a child with the disability may lead to a higher therapeutic success.

References

1. Lonstein JE (2006) Scoliosis: surgical versus nonsurgical treatment. *Clin Orthop Relat Res* 443: 248-259.
2. Parent S, Newton PO, Wenger DR (2005) Adolescent idiopathic scoliosis: etiology, anatomy, natural history, and bracing. *Instr Course Lect* 54: 529-536.
3. Vasiliadis E, Grivas TB (2008) Quality of life after conservative treatment of adolescent idiopathic scoliosis. *Stud Health Technol Inform* 135: 409-413.
4. Parent S, Newton PO, Wenger DR (2005) Adolescent idiopathic scoliosis: etiology, anatomy, natural history, and bracing. *Instr Course Lect* 54: 529-536.
5. Kotwicki T, Negrini S, Grivas TB, Rigo M, Maruyama T, et al. (2009) Methodology of evaluation of morphology of the spine and the trunk in idiopathic scoliosis and other spinal deformities - 6th SOSORT consensus paper. *Scoliosis* 4: 26.
6. Negrini S, Aulisa AG, Aulisa L, Circo AB, de Mauroy JC, et al. (2012) 2011 SOSORT guidelines: Orthopaedic and Rehabilitation treatment of idiopathic scoliosis during growth. *Scoliosis* 7: 3.
7. Negrini S, Grivas TB, Kotwicki T, Maruyama T, Rigo M, et al. (2006) Why do we treat adolescent idiopathic scoliosis? What we want to obtain and to avoid for our patients. *SOSORT 2005 Consensus paper. Scoliosis* 1: 4.
8. Naughton MJ, Shumaker SA (2003) The case for domains of function in quality of life assessment. *Qual Life Res* 12: 73-80.
9. Botens-Helmus C, Klein R, Stephan C (2006) The reliability of the Bad Sobernheim Stress Questionnaire (BSSQbrace) in adolescents with scoliosis during brace treatment. *Scoliosis* 1: 22.
10. Peterman AH, Cella D (2000) Quality of life. *Encyclopedia of Psychology*. Oxford University Press-American Psychological Association, Oxford, UK.
11. Weiss HR, Werkmann M, Stephan C (2007) Brace related stress in scoliosis patients - Comparison of different concepts of bracing. *Scoliosis* 2: 10.
12. Pham VM, Houlliez A, Carpentier A, Herbaux B, Schill A, et al. (2008) Determination of the influence of the Chêneau brace on quality of life for adolescent with idiopathic scoliosis. *Ann Readapt Med Phys* 51: 3-8, 9-15.
13. Bunge EM, Juttman RE, de Kleuver M, van Biezen FC, de Koning HJ; NESCIIO group (2007) Health-related quality of life in patients with adolescent idiopathic scoliosis after treatment: short-term effects after brace or surgical treatment. *Eur Spine J* 16: 83-89.
14. Cheung KM, Cheng EY, Chan SC, Yeung KW, Luk KD (2007) Outcome assessment of bracing in adolescent idiopathic scoliosis by the use of the SRS-22 questionnaire. *Int Orthop* 31: 507-511.
15. Kotwicki T, Kinel E, Stryla W, Szulc A (2007) Estimation of the stress related to conservative scoliosis therapy: an analysis based on BSSQ questionnaires. *Scoliosis* 2: 1.
16. Misterska E, Glowacki M, Harasymczuk J (2009) Polish adaptation of Bad

- Sobernheim Stress Questionnaire-Brace and Bad Sobernheim Stress Questionnaire-Deformity. Eur Spine J 18: 1911-1919.
17. Vasiliadis E, Grivas TB, Gkoltsiou K (2006) Development and preliminary validation of Brace Questionnaire (BrQ): a new instrument for measuring quality of life of brace treated scoliotics. Scoliosis 1: 7.
18. Ugwonalı OF, Lomas G, Choe JC, Hyman JE, Lee FY, et al. (2004) Effect of bracing on the quality of life of adolescents with idiopathic scoliosis. Spine J 4: 254-260.
19. Sapountzi-Krepia D, Psychogiou M, Peterson D, Zafiri V, Iordanopoulou E, et al. (2006) The experience of brace treatment in children/adolescents with scoliosis. Scoliosis 1: 8.
20. Danielsson AJ, Wiklund I, Pehrsson K, Nachemson AL (2001) Health-related quality of life in patients with adolescent idiopathic scoliosis: a matched follow-up at least 20 years after treatment with brace or surgery. Eur Spine J 10: 278-288.
21. Asher M, Lai SM, Burton D (2003) Discrimination validity of the Scoliosis Research Society-22 patient questionnaire: relationship to idiopathic scoliosis curve pattern and curve size. Spine 28: 74-78.
22. Leszczewska J, Czaprowski D, Pawłowska P, Kolwicz A, Kotwicki T (2012) Evaluation of the Stress Level of Children with Idiopathic Scoliosis in relation to the Method of Treatment and Parameters of the Deformity. ScientificWorldJournal 2012: 538409.

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