Detection pattern and outcome assessment in adolescent idiopathic scoliosis

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ABSTRACT

The detection pattern of adolescent idiopathic scoliosis (AIS) without scoliosis screening has not been investigated despite the fact that early detection is the key to appropriate and successful treatment. Quality of life in these young patients after completed treatment has not yet been sufficiently explored in relation to monitoring, bracing, surgery and neither in relation to healthy controls.

Firstly, the aim was to elucidate the detection pattern of adolescent idiopathic scoliosis and to ascertain the initiation of treatment performed. Secondly, to measure quality of life in AIS patients by means of the Scoliosis Research Society Instrument 24 (SRS 24) two years after completed brace and/or surgery treatment in relation to treatment performed. Thirdly, to assess outcome in AIS patients by means of the SRS 24, SF 36 and ODI, and to evaluate the ability of these instruments to identify and distinguish life quality differences among AIS patients' treatment groups and compared to healthy controls.

In the first study, 234 AIS patients, 194 females and 40 males, treated at the spine section of the Aarhus University Hospital in 1990-1999 were investigated by means of questionnaires and journal and radiograph review with reference to detection- and treatment mode, time and Cobb angle at various time junctures.

In the second study, 118 AIS patients, treated in January 1, 1987-December 31, 1997, were investigated by means of the SRS 24, treated with brace (B), surgery (S), or brace and surgery (BS), at least two years after follow-up at the time of the investigation in 1999.

In the third study, functional outcome of 157 patients was assessed by means of SRS 24, SF 36, and ODI. They had been monitored (M), braced (B), undergone surgery (S), or had been both brace and surgically treated (BS), with at least 5-years follow-up after completed treatment at the time of investigation in 2002; these outcome scores were compared with those of 121 sex- and age-matched healthy controls (C).

In the first study we found that scoliosis was detected at a late age: 13.6 ± 2.2 years; most cases were detected either domestically (49%) or within the school health examination system (36.2%), presented with a Cobb angle of thoracic 32.6 ± 17.1 degrees and lumbar 30.2 ± 15.1 degrees. 46.5 % of brace-treated patients were subsequently surgically treated.

The second study showed that quality of life in B and S+BS treated patients did not differ in the total SRS 24 score. B had a better general self-image and a higher activity level, while in the SRS 24, S and BS demonstrated better self-image and a higher satisfaction post-treatment.

In the third study, AIS patients demonstrated on the whole relatively high (good outcome) scores no matter which outcome instrument was used. All AIS patients showed a slight but statistically significant impairment in GH and PF compared to the background population. B experienced more pain than all other groups as shown in SRS 24, SF 36 and ODI. S and BS patients were negatively affected in their overall physical performance (SF 36) both in relation to C, M, and B, but they were least affected by disabling pain (ODI). None of the groups showed significantly diminished mental or social scores.

Despite the fact that early detection of scoliosis is an essential element in proper brace treatment management, screening is not implemented in Denmark. The current health system has a poor detection capacity , with a 2-year delay in comparison to international standards. As the situation stands now, the effectiveness of brace treatment with late detection is inadequate in terms of preventing subsequent surgical treatment; bracing's potential preventive effect on the development of Cobb angles is not adequately exploited. This study points out that in health assessment in adolescents, the current haphazardness of AIS detection should be replaced with detection regiments from an early age. We suggest a scoliometer screening by school nurses at age 10-11. The results of Studies 2 and 3 showed that there is no viable justification for avoiding brace treatment as otherwise suggested by some authors. All treatment groups thrive; B did not suffer major impairments in relation to S and BS, and neither did BS treatment appear to jeopardize an ultimately good outcome. Both SF 36 and SRS 24 disclosed differences among the treatment groups especially in pain and physical performance. The SF6 identified a stigmatization of all AIS patients in relation to a slight but significantly impaired general health and physical function. ODI was less relevant in this patient group, because pain complaints in this age group were minimal (<11%), and it is most likely that such low scores in terms of disability are not clinically relevant. However, actively treated AIS patients could be distinguished from control subjects by their slightly poorer but statistically significantly impaired ODI scores.