MaHTAS
Malaysian Health Technology Assessment Section

School Scoliosis Screening Programme

Executive Summary

[Adapted from the report by DR JUNAINAH SABIRIN]

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Background

Scoliosis is a lateral curvature of the spine greater than 10° as measured using Cobb method on a standing radiograph. Adolescent idiopathic scoliosis is the most common form of idiopathic scoliosis. The prevalence of adolescent idiopathic scoliosis varies according to the Cobb angle, between 0.1% in curvature greater than 40° Cobb angle to 2% to 3% in curvature greater than 10° Cobb angle. Severe scoliosis may have significant impact on physical and psychosocial disorders such as a decrease in pulmonary capacity, back pain and lower marriage rate. School scoliosis screening in asymptomatic school children remains controversial with some countries advocating it and others are against it.

Technical Features

The traditional methods such as Adams forward-bending test, the assessment of the angle of trunk rotation by scoliometer, Moire topography, and the measurement of rib hump are the most common screening tests for scoliosis, worldwide.

Policy Question

Should scoliosis screening among children be instituted in Malaysian School Health Programme?

Objective

To assess the effectiveness and economic implications of school scoliosis screening programme.

Methods

Electronic databases such as MEDLINE, PubMed, EBM Reviews-Cochrane Database of Systematic Reviews, EBM Reviews-Cochrane Central Register of Controlled Trials, EBM Reviews-HTA databases, EBM Reviews-NHS Economic Evaluation Database, EBM Full Text-Cochrane DSR, ACP Journal Club and DARE were searched. There was no limitation in the search. All relevant literature was appraised using the Critical Appraisal Skills Programme (CASP) and evidence was graded based on guidelines from U.S./Canadian Preventive Services Task Force or Hierarchy of evidence for test accuracy studies, CRD Report Number 4 (2nd Edition).

Result and conclusion

Girls achieve adolescence two years before boys and are afflicted with scoliosis three to four times more frequently than boys. This statement is supported by this review. The prevalence of scoliosis was higher in girls compared to boys. Prevalence in girls was low for six to ten years of age but increased rapidly from eleven to fourteen years of age.

There was fair level of evidence to suggest that school scoliosis screening programme was able to detect scoliosis at a younger age and with smaller Cobb angle and was able to reduce the frequency of surgical treatment. The cost of screening a child ranged from USD $0.07 to USD 43.70 depending on how it was calculated. There was also evidence to suggest that school scoliosis screening programme was cost-effective.

There was fair level of evidence to suggest that Adams forward-bending test, measurement of angle of trunk rotation using scoliometer, measurement of rib hump height using humpometer and Moire topography can be used as a screening test for scoliosis screening in schools and is not time consuming. However, the use of Adams forward-bending test may result in high false negatives which may

lead to miss-diagnosis while the use of other screening tests such as scoliometer, Moire topography and humpometer may lead to high false positives and will cause over-referrals. Few studies have suggested that the use of cut off limits for referrals such as asymmetry of two Moire fringes, a humpogram deformity = 10 mm, and 7° or 8° of scoliometer angle would lead to a reduction in the number of referral for radiographic examination.

There was evidence to suggest radiographic examination for scoliosis follow-up was safe. Proper training of the staff involved in the screening is necessary together with a good referral and follow-up system based on ethical and organisational consideration

Recommendation

Based on the above review, screening for scoliosis among school children is recommended only for high risk group such as girls at twelve years of age (standard six). A combination of modalities of screening tests such as Adams forward-bending test and scoliometer with angle of trunk rotation of 7º is recommended with the aim of reducing the number of referrals. However, organisational issues such as training, manpower, good referral system, treatment and funding need to be addressed at all levels.