STAYING AHEAD OF THE CURVE

Research reveals five percent of children with scoliosis delay seeking treatment

Cheri Chan, Undergraduate, Nanyang Technological University
Associate Professor Kevin Lim, Senior Consultant, Department of Orthopaedic Surgery and Chairman, Division of Surgery, KK Women's and Children's Hospital

X-Ray of a patient with severe AIS, with a spinal curve of 90 degrees.

Scoliosis is an unnatural curvature of the spine that is common in children. The condition has an incidence rate of two percent in Singapore, and is most often seen in healthy children and adolescents aged ten years or more. While scoliosis is believed to be multifactorial, the condition has no obvious cause in a majority of cases, giving rise to the term adolescent idiopathic scoliosis (AIS).

The severity of AIS is categorised by degree of spinal asymmetry, as measured by the Cobb angle. Categories include: mild (less than 25 degrees), moderate (25 to 40 degrees) and severe (greater than 40 degrees). Management is dependent on the patient's age, stage of development and degree of spinal asymmetry; treatment modalities include observation, bracing and surgery.

Since 1982, nationwide screening for the early detection of AIS in children has been carried out in schools. As the condition presents during puberty, girls undergo screening from 11 to 14 years, and boys undergo screening from 14 to 15 years. Children identified to be at risk for AIS are then referred for tertiary evaluation.

STUDY FINDS PATIENTS DELAY SEEKING TREATMENT

From 2007 to 2008, the Department of Orthopaedic Surgery at KK Women's and Children's Hospital (KKH) observed an unusually high number of patients with AIS presenting with severe scoliosis on their first visit. In most cases, this late presentation necessitated surgical intervention as the only viable treatment option.

A study* was commissioned to investigate the occurrence of late presentation in patients with AIS – 'late' being defined as scoliosis with a Cobb angle of 40 degrees or more. The study also aimed to explore the possibility of a time delay in seeking tertiary evaluation, and probable factors for the delay.

The researchers reviewed data from 1,176 children with AIS who sought tertiary evaluation at KKH from 2007 to 2011. They found that 65 (5.5%) patients presented with scoliosis at a Cobb angle of 40 degrees or more on their first visit. Of this group of patients, 48 (73.85%) agreed to an interviewer-administered survey.

Half of the survey respondents admitted either delaying seeking tertiary evaluation for more than a month after initial referral, or failing to attend school health service appointments.

Top three reasons for the delay in seeking tertiary evaluation included:

1. Did not think that scoliosis was a problem
2. Too busy
3. Did not know it was scoliosis

Of the survey respondents, 27 percent tried an alternate form of treatment, such as traditional massage or chiropractic therapy, prior to seeking tertiary evaluation. More than half of the survey respondents had no knowledge of AIS prior to their diagnosis. Even amongst respondents with some prior knowledge of AIS, understanding of the condition was poor.

All survey respondents eventually sought tertiary evaluation upon visible worsening of the scoliosis, or repeated advice by medical professionals and family.

PATIENT EDUCATION CRUCIAL TO COMBAT INDIFFERENCE

In a study by Rogala et al in 1985, the occurrence rate of patients with AIS who had scoliosis at a Cobb angle of 40 degrees or more on initial presentation was 0.1 percent. In comparison, the occurrence rate of 5.5 percent observed in the KKH study is significantly higher.

The findings of the KKH study suggest that this high occurrence rate could be due to indifference caused by lack of knowledge about AIS. The condition does not present with pain, and in its early stages, any cosmetic deformity is often very subtle and may not be visibly apparent. These factors could further contribute to patients underestimating the potential severity of the condition, and thus delaying seeking tertiary evaluation and treatment.

In general, mild scoliosis can be observed, and moderate scoliosis (25 to 40 degrees) may benefit from spinal bracing to reduce the likelihood that the condition will progress to the stage where surgery is required.

However, spinal bracing is only suitable for children whose skeletal systems are still immature, and in whom the risk of progression is greatest. Girls attain skeletal maturity at 14 to 15 years, while boys do so at 16 to 17 years.

For patients with severe scoliosis (greater than 40-45 degrees) whose skeletal systems have matured, surgical intervention is often the only viable treatment option. The most common surgical treatment for AIS is spinal fusion, where two or more spinal vertebrae are surgically fused together, immobilising part of the spine.

In the event that intervention is not sought for severe scoliosis, the spinal curvature will continue to progress in adulthood. This places the patient at increased risk of developing back pain, worsening physical deformity and impacted lung function in some cases.

EARLY EVALUATION RECOMMENDED FOR BEST OUTCOMES

Early detection and timely spinal bracing with good compliance have proven to be successful in controlling the progression of scoliosis; ultimately reducing the likelihood of the patient being required to undergo surgery. Crucial to this is timely tertiary evaluation for children who have been positively screened for scoliosis or those in whom scoliosis is suspected.

Greater patient education and awareness, and timely tertiary evaluation are critical to arrest the high occurrence rate of late presentation of patients with AIS and help patients achieve optimal outcomes. Primary health care providers are strongly encouraged to:

- Maintain a healthy index of suspicion for scoliosis, especially for adolescent patients
- Educate patients and caregivers on the potential severity of the condition
- Encourage patients and caregivers to seek prompt tertiary evaluation, to reduce the likelihood of the patient requiring surgical intervention.

* The study was led by Dr Joel Lee and Dr Derrick Lam, under the supervision of Assoc Prof Kevin Lim. During the study, Dr Lee and Dr Lam were fourth year medical students at the Yong Loo Lin School of Medicine, and are now both residents with the Department of Orthopaedic Surgery, KKH.

A paper outlining the study findings, entitled 'Late presentation in adolescent idiopathic scoliosis: who, why and how often?' was published in the January 2014 issue of Journal of Pediatric Orthopaedics B.

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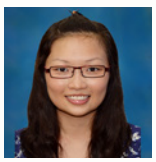

Cheri Chan is an undergraduate at Nanyang Technological University, majoring in Biological Science. She is currently a student intern at the Department of Orthopaedic Surgery, KKH.

Associate Professor Kevin Lim underwent subspecialty training in paediatric orthopaedics at The Hospital for Sick Children in Toronto, Canada and at The Starship Children's Hospital in Auckland, New Zealand. His subspecialty interests include scoliosis, clubfoot, cerebral palsy, and fractures in children.

In addition to his roles at KKH, Assoc Prof Lim is Board Chairman and volunteer doctor at the Cerebral Palsy Alliance Singapore. He also serves as Academic Deputy Chair for the SingHealth-Duke NUS Surgery Academic Clinical Program, and Board Member for the Chapter of Orthopaedic Surgeons, College of Surgeons, Academy of Medicine, Singapore.