Perception of Spinal Deformity Among Patients with Adolescent Idiopathic Scoliosis

Ng M.S.P.[1], Yap K.[1], Blok S.Z.[1], Liu G.[2], Wong H.K.[2], Lau L.L.[2]
[1]Yong Loo Lin School of Medicine, National University of Singapore, Singapore, Singapore;
[2]Department of Orthopaedic Surgery, National University Hospital, Singapore, Singapore

Introduction Adolescent idiopathic scoliosis (AIS) is the most common form of structural spinal deformity, affecting 1% to 4% of children globally. Patients with AIS are generally pain-free, however, some might be able to perceive their skeletal deformity, thus affecting their self-image. Major Cobb angle, coronal balance and truncal balance are radiological measurements used to evaluate AIS severity. The threshold of spinal deformity that alters patients' perception of their deformity is not known.

Objectives (1) To determine the correlation of the severity of scoliotic deformity using radiological measurements of major Cobb angle, coronal balance, truncal balance and curve type with an established validated SRS-22r instrument consisting of an overall score and five domains of self-image, pain, function, mental health and satisfaction. (2) To evaluate other demographic factors such as curve type, gender and age affecting patient perception of scoliotic deformity.

Materials and methods A retrospective analysis of prospectively collected SRS-22r data from 357 consecutive patients between February 2020 and May 2021 was conducted. Inclusion criteria were (1) 11 to 20 years old, (2) no leg length discrepancy, (3) underwent scoliosis screening at our tertiary institution. Each patient completed their SRS-22r questionnaire online prospectively. Standing erect radiographs of the patients were obtained using an EOS Imaging System. Radiological measurements were obtained by one researcher and confirmed by an Orthopaedic spine surgeon.

Results / Discussion Major Cobb angle and truncal balance had a significant but small negative correlation with SRS-22r. Coronal balance had no significant correlation with SRS-22r. Multiple regression showed that skeletal deformity (as measured by major Cobb angle and truncal balance) significantly affected self-image but not pain for patients with a major Cobb angle of 51-60° ($R^2=0.265$, $p<.01$), 61-70° ($R^2=0.528$, $p<.01$), and above 70° ($R^2=0.277$, $p<.01$). Skeletal deformity also significantly affected the self-image of patients with a single curve ($R^2=0.117$, $p<.01$), patients who are female ($R^2=0.139$, $p<.01$), and patients who are 14 years old and above ($R^2=0.252$, $p<.01$).

Conclusion In our cohort, patients only started perceiving their scoliotic deformity when their major Cobb angle is above 50°. Patients who have a single curve were more likely to perceive their deformity than those with a double curve. Female patients and those who were 14 years old and above are more likely to perceive their deformity. Lastly, there was no clear relationship between pain and scoliosis.

Acknowledgements No funding was received. The authors would like to acknowledge Jeremy J.E. Chew and Juliana J.W Koh for their invaluable support throughout the study.