GLOBAL BALANCE IN ADULT SPINAL DEFORMITIES. 
A STUDY OF 60 CASES

INTRODUCTION

Adult scoliosis is defined as an abnormal curvature greater than 10° in a patient older than 18 years of age who has reached skeletal maturity of Risser grade 5.1,2 Sometimes this results from a curvature that was present in childhood and never treated, and which consequently progressed.3,4 If scoliosis is present in an adult without any precedent of curvature in childhood, it is classified as degenerative (De Novo) adult scoliosis.5,6 As we age, there are changes in the spine due to the failure of the discogenic cascade and changes produced at the level of the facet joints that produce antero-, retro-, or laterolisthesis and lead to radicular compression.7

Worldwide, adult scoliosis has been referred to as affecting a very wide range that goes from 2% to 32%.5 It is estimated that approximately 65% of the cases of scoliosis are idiopathic, 15% are congenital, and...
another 10% are secondary to neuromuscular diseases. In our country there are no statistics for this pathology, but we do know that it is a growing problem, as evidenced by the numbers from INEGI, since in the 50s there were only 554,000 patients over the age of 60, and in the 90s the number had practically tripled to 1,611,317 residents, and in 2010 to 3,116,466 with a rate of aging of 31%. Because of this, and because the traditional Lenke classification for idiopathic scoliosis was not sufficient to cover this pathology, there were multiple attempts to classify it, those by Aebi in 2005, Schwab in 2006, and the SRS in 2011 to name a few.

Today, there is a great deal of interest in spinal pelvic balance as described by Roussouly and Gollogly such that three sagittal modifiers of spino-pelvic balance were included in the 2013 classification of the Scoliosis Research Society—Schwab Adult Spinal Deformity Classification. To determine the most prevalent curve in our population, to quantify radiographic parameters such as PT, PI, and SS, and to compare function according to the ODI and SRS 22r questionnaires.

**MATERIAL AND METHODS**

Retrospective, observational, longitudinal, single-center study. During the period between January 2010 and May 2015 in the Spine Surgery Service of the Centro Médico ISSEMYM Ecatepec. This includes a total of 60 patients, all of whom signed the term of consent. The approval of the Ethics Committee was not required for this retrospective study in our unit.

**RESULTS**

In this study, we obtained a sample made up of (n) 60 patients, 24 men, and 36 women. The average age was 68.5 ± 5.5 years. Spinal deformity was classified according to the SRS-SCHWAB radiographic measurement taken as part of the pre-surgery planning protocol in order to classify the deformities and are displayed in Figure 1 below. In turn, we also classified the type of lordosis present in the patients according to the classification of Pierre Roussouly and found that type 4 was the most common at 36.66%, followed by types 1 and 3 with a total of 15 patients each, and finally by type 2 at only 8%. Patient disability was measured prior to surgery using the ODI and SRS 22r tests. The results are displayed below. (Figure 2) As we can see, the level of disability is high in both tests, which is the reason why patients accepted surgical treatment. In terms of post-surgical results, we find an improvement in almost all the radiographic measurement taken, as can be seen in Figure 3.

An improvement in disability scores is observed, but the improvement was only greater than 15 points in the postoperative ODI for type L curves. The Student’s t test for dependent variables yielded a p value < 0.001 (CI 95% of the difference -0.8 to -0.3). (Figure 4) Regarding the VAS, we can see in Figure 5 that the results decrease progressively to a VAS of between 2 and 3 for all types of curves. Next, the results of the SRS 22r test show improvement. The Student’s t test for dependent variables yielded a p value < 0.001 (CI 95% of the difference -0.8 to -0.3). (Figure 6) Complications included the dehiscence of a wound and a seroma, both of which were resolved without further complications.

**DISCUSSION**

In our study we found a greater incidence of spinal deformities in the group of women, with a percentage of 60%, which is not an overwhelming difference like that reported by Daubs et al. in their case series with 38 women and 8 men. In this study we found that the most common type of curve was thoracolumbar with a total of 46.6%, which corresponds to that found by Bridwell et al. in their case series, and also corresponds to the changes found in the population pyramid with the increasing population older than 60 years of age, which agrees with the data reported by INEGI. We found an average preoperative VAS of 7 for all types of curves and a 6-month postoperative VAS of 3. Application of the SRS 22r test yielded a preoperative average of 2.1 for all curves and increased to 3.75 postoperatively, similar to the findings of Crawford et al. who reported a change in the SRS 22r from 2.93 to 3.65 points following surgery. It is clear that the patients scored better because of an improvement in body image, but also because of better global balance, pain reduction, and therefore, a return to increased patient activity.
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Figure 4. Pre- and postoperative disability according to ODI (Oswestry Disability Index).

Figure 5. Follow-up of postoperative pain using VAS (Visual Analog Scale).

Figure 6. Measurement of disability according to SRS 22R, for all types of curves.

CONCLUSION

Adult spinal deformities are a growing disease in our country. Surgical management of these deformities requires proper clinical and radiographic planning. The patients in our study who underwent surgical treatment for type L curvature showed significant improvement in ODI and SRS 22R scores.

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REFERENCES