Reviewer's report

Title: Evaluation of coronal shift as an indicator of neuroaxial abnormalities in adolescent idiopathic scoliosis: A prospective study.

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Reviewer: Joshua Pahys

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The authors report a consecutive prospectively collected group of 143 patients with presumed Adolescent Idiopathic Scoliosis (AIS). Patients were excluded from the study if they had any neurologic findings on clinical exam other than asymmetric superficial abdominal reflex (ASAR). The study found a higher incidence of neural axis abnormalities in patients with a significant coronal shift (defined as >15mm), positive ASAR, and younger age. Screening MRI was recommended in these patients.

This is a very reasonable study of a prospectively collected group of patients, as obtaining a screening MRI in patients with presumed AIS has been debated. I have several comments below:

Major Compulsory Revisions:
Results Page 4 Line 23: The authors state: “Significant coronal imbalance is defined as a 15mm shift of C7 plumb line from natal left…” The authors cite the SRS website for this measurement; however, I was unable to find this definition on the website myself. Please expound on how this measurement was chosen as other studies, one which you cite in your paper, use 2cm. Was this an arbitrary determination, or one that was reached in order to achieve a statistically significant result? As stated in the discussion section, Lee et al uses 2cm to define imbalance, which their study did not correlate with an increased incidence of neural axis abnormalities. Using 2cm for this study, or perhaps reporting 15mm and 2cm would allow a more direct comparison between the two studies. If the authors wish to use 15mm to define coronal imbalance, it should be supported by a reference.

Minor Revisions:
Results Page 4, 1st line: The acronym “AIS” has already been established for Adolescent Idiopathic Scoliosis in the Materials and Methods section. Therefore, I would delete Adolescent Idiopathic Scoliosis in the Results section and simply write “AIS”.

Page 5 Line 24: “natal left”: I am less familiar with this terminology. When referring to coronal imbalance, this is typically measured as the distance from the C7 plumb line to the Center Sacral Vertical Line (CSVL).

Page 8 Line 22: “…presence of neurological deficit sign…” Personally, I would not use the term “neurological deficit sign” as this could imply sensory, motor, or
upper motor neuron deficits. I would recommend using “ASAR,” as this was the neurologic finding that was referred to in the manuscript.

Discretionary Revisions:
Discussion Page 8, 2nd paragraph: The authors report 6/6 patients with ASAR and neural axis abnormalities, but then state that 13 patients with abnormal neuroaxial abnormalities had a normal neurologic exam. Perhaps I may be misreading the paragraph, but 6 patients with an abnormal exam and 13 patients with a normal exam add up to 19 patients. The authors report 17 patients with a neuroaxial abnormality. Please clarify the discrepancy.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I have no known competing interests with this manuscript