AUTHOR'S REPLY

Answer to the Letter to the Editor of Weiss HR et al. concerning "Head to pelvis alignment of adolescent idiopathic scoliosis patients both in and out of brace" by Vergari C, Courtois I, Ebermeyer E, Pietton R, Bouloussa H, Vialle R, Skalli W (Eur Spine J; 2019: https://doi.org/10.1007/s00586-019-05981-8)

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We thank the authors of the Letter to the Editor for their interest in our work. It is sometimes challenging to detail brace types when performing multicentric, multiphysician studies. In the original manuscript, we specified that we included 12 nighttime braces and 30 TLSO, without further detail; detailing the principles of correction was not feasible because four types of braces were present (CAEN, Charleston, CTM, 3D Graf–Hecquet brace). There is no consensus on which brace design is more effective for a given spinal topology; therefore, we feel that, at this stage, imposing the same brace type to all patients would not be beneficial for all patients.

The average values reported in our study (Table 1) show good global outcome, with a significant $10°$ reduction in Cobb angle. Admittedly, the loss of lordosis is, in average, still an issue. Nevertheless, limiting the analysis to average values and to optimal outcomes would hide the complex interactions between patient and brace. Within this context, the aim of Figure 8 is to illustrate a specific compensation mechanism, i.e., the simultaneous decrease in both lumbar lordosis and pelvic tilt. We believe that the improvement of our understanding of brace effects does not go through the extensive study of the most successful cases, but rather through the in-depth, patient-by-patient analysis, especially the less-than-optimal outcomes.

The main aim of this study was to quantify the alterations introduced in sagittal alignment by bracing, and how patients reorganize their balance to compensate for this alteration. In particular, previous works already assessed the spinal parameters in-brace, so in this study we focused on what occurs above and below the brace: the head and pelvis. Therefore, we specifically analyzed those compensation mechanisms that patients employ to maintain balance. We agree with the authors of the letter to the editor that studies on brace efficacy should strive to quantify wear compliance, but assessing brace efficacy was not in our scope, and compliance did not come into play in this work since we limited the study to very short-term effects, with no analysis on efficacy. This was chosen by design, in order to exclude growth and other long-term brace wearing effects which could lead to altering the initial compensation mechanisms.

In conclusion, this cross-sectional study sheds light on phenomena that still remain incompletely elucidated; using our proposed systematic analysis, we hope that we raised awareness on compensation mechanisms that were not described previously. We believe this represents a scientific addition to the literature since it can be used as a tool for clinicians to further describe changes in 3D characteristics of patient series with bracing treatment.

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