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Letter to the Editor

On "The Impact of Hypopressive Abdominal Exercise on Linea Alba Morphology in Women Who Are Postpartum: A Short-Term Cross-Sectional Study." Arranz-Martín B, Navarro-Brazález B, Sánchez-Sánchez B, McLean L, Carazo-Díaz C, Torres-Lacomba M. *Phys Ther.* 2022;102:pzac086. https://doi.org/10.1093/ptj/pzac086

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We read the article by Arranz-Martín et al[1] with great interest. However, we are concerned about the theoretical rationale, methodology, and conclusion of this paper. In the Introduction, the authors state:

> Linea alba stiffness appears to play an important role in the transmission of muscle forces across the midline to achieve optimal abdominal wall function. The extent of distortion or slackness in the linea alba seen during abdominal muscle tasks has been proposed as a means of evaluating linea alba stiffness, hence its contribution to supporting the abdominal wall and transferring loads across the midline during a task.

However, distortion index is only a proposed measure that has not been tested for reliability and validity. Lee and Hodges[2] introduced the linea alba distortion index to describe the distortion of the linea alba:

> . . . the distortion index is not a perfect measure of LA [linea alba] tension, as a curved LA may also become tense if loaded by intraabominal pressure. Thus, the measure is not expected to maintain a linear relation to tension, but to provide a surrogate index that can be quantified without highly specialized equipment (eg, elastography). Pilot data from a validation study to compare the distortion index and measures made with elastography support this proposal (unpublished data).[2]

To our knowledge, this is still not published. Beamish et al[3] stated, "Before shearwave elastography or the distortion index are used in a clinical context, full reliability analyses are essential." We have not been able to find such analyses in the published literature.

Arranz-Martín et al claim that "Ultrasound imaging is the current gold standard for assessing the linea alba both in terms of IRD and linea alba distortion." This is correct regarding measurements of the interrectus distance (IRD), but not for measuring linea alba distortion. The references used in the article for validity studies on linea alba distortion state that, "While the distortion index may provide insight into the functional impacts of DRA [diastasis recti abdominis], it has not been validated against LA stiffness."[3] Additionally, Beamish and colleagues stated,"Our results support further research on the influence of LA distortion and LA stiffness in evaluating the biomechanical implications of DRA . . . . We do not yet know the implications of LA stiffness or distortion on the symptoms or functional abilities of women with DRA."

Furthermore, Arranz-Martín et al stated that "Abdominal hypopressive exercises (AHE) are recommended as a global therapeutic exercise approach to target abdominal and pelvic floor symptoms among women who are postpartum."[1] However, searches on PubMed and PEDro databases yield no hits on randomized controlled trials (RCTs) of hypopressive exercise for DRA, and RCTs comparing PFMT with PFMT + hypopressive exercise for urinary incontinence and pelvic organ prolapse show no additional effect of adding this intervention to PFMT. The reference used in the study is a book by Caufriez[4] based on postulates and no evidence from RCTs.

The rationale for the Arranz-Martín study is based on instruments that are not validated or tested for reliability and on an intervention that is not evidence based.

They described that:

> Linea alba distortion is seen on ultrasound examination as loss of tautness of the linea alba between the rectus abdominis muscles. Distortion was classified dichotomously as 'no' if the linea alba was visible along a straight line between the bellies of the rectus abdominis muscles bilaterally, and 'yes' if the linea alba was observed to deform anteriorly or posteriorly in both repetitions of each exercise . . . . For the binary outcome linea alba distortion, we checked that both measurements of each exercise always coincided."

It is not clear how this was done or whether the raters were blinded to assessments of coincided findings. This classification seems to be highly subjective, and Figure 2 does not show the criteria used to classify presence of distortion.

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By modifying the unvalidated distortion index of Lee and Hodges, the authors introduce an additional new measurement method, neither validated nor tested for reliability. They base their conclusions on observation of the linea alba distortion alone. In our experience, in wider IRDs, it is very common to see portions of the linea alba slightly curved or blurred and other portions straight, and there are many sources of possible "distorted images":

1) If the pressure made with the probe is not horizontal, the 2 rectus abdominis muscles will not appear aligned, and this could interfere with the visualization of a straight line of the linea alba.
2) The same happens with a slight upwards or downwards tilt of the probe, where, depending on the inclination, the operator can get a clear image of the structures or a fuzzy image. This is hard to interpret and can give the impression of distortion when it is probably a technical artifact.

Arranz-Martín et al state that "Previous studies have analyzed the variation of the IRD during different abdominal exercises in nulliparous women or women with diagnosed DRA, but this is the first study, to our knowledge, to evaluate the acute effects of different abdominal exercises on IRD among women who are postpartum." This is not correct. Several published studies have reported on this.[5–7]

The authors also state in the discussion that, although the results are not statistically significant, "the hypopressive posture itself tends to narrow the IRD at all linea alba points." It is, therefore, surprising to spend the next paragraph arguing the importance of this hypopressive posture in rehabilitation of DRA despite the findings not being statistically significant.

All measurement points were less than the minimal detectable change, hence the clinical significance may be limited. The authors' conclusions in favor of hypopressive exercise are, therefore, too strong. Given the lack of a clear description of the methodology and the lack of a reliable and valid outcome measure, it is difficult to understand how the results of this study can be valid.

Author Contributions

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Disclosures

The authors completed the ICMJE Form for Disclosure of Potential Conflicts of Interest and reported no conflicts of interest.

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