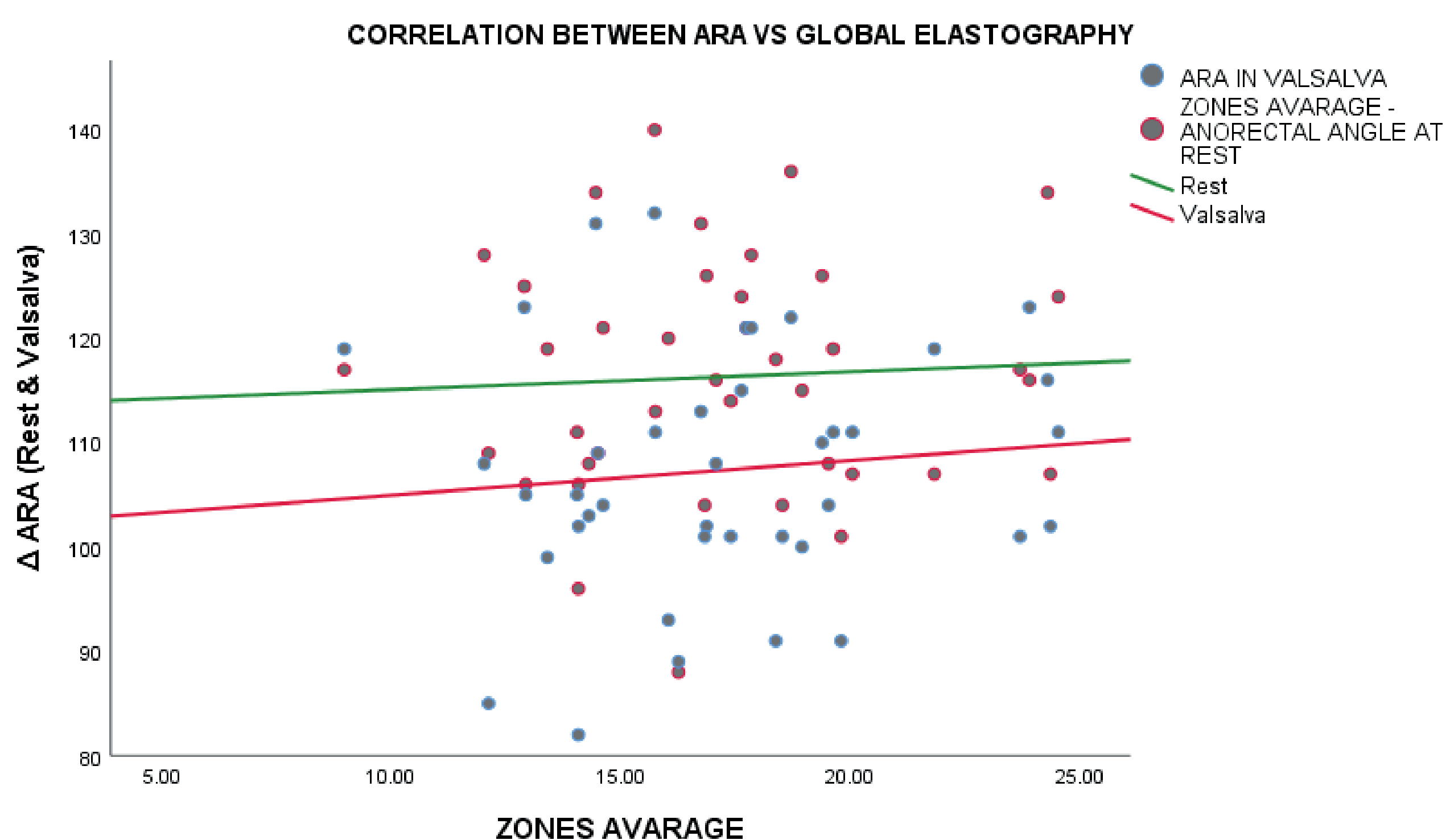
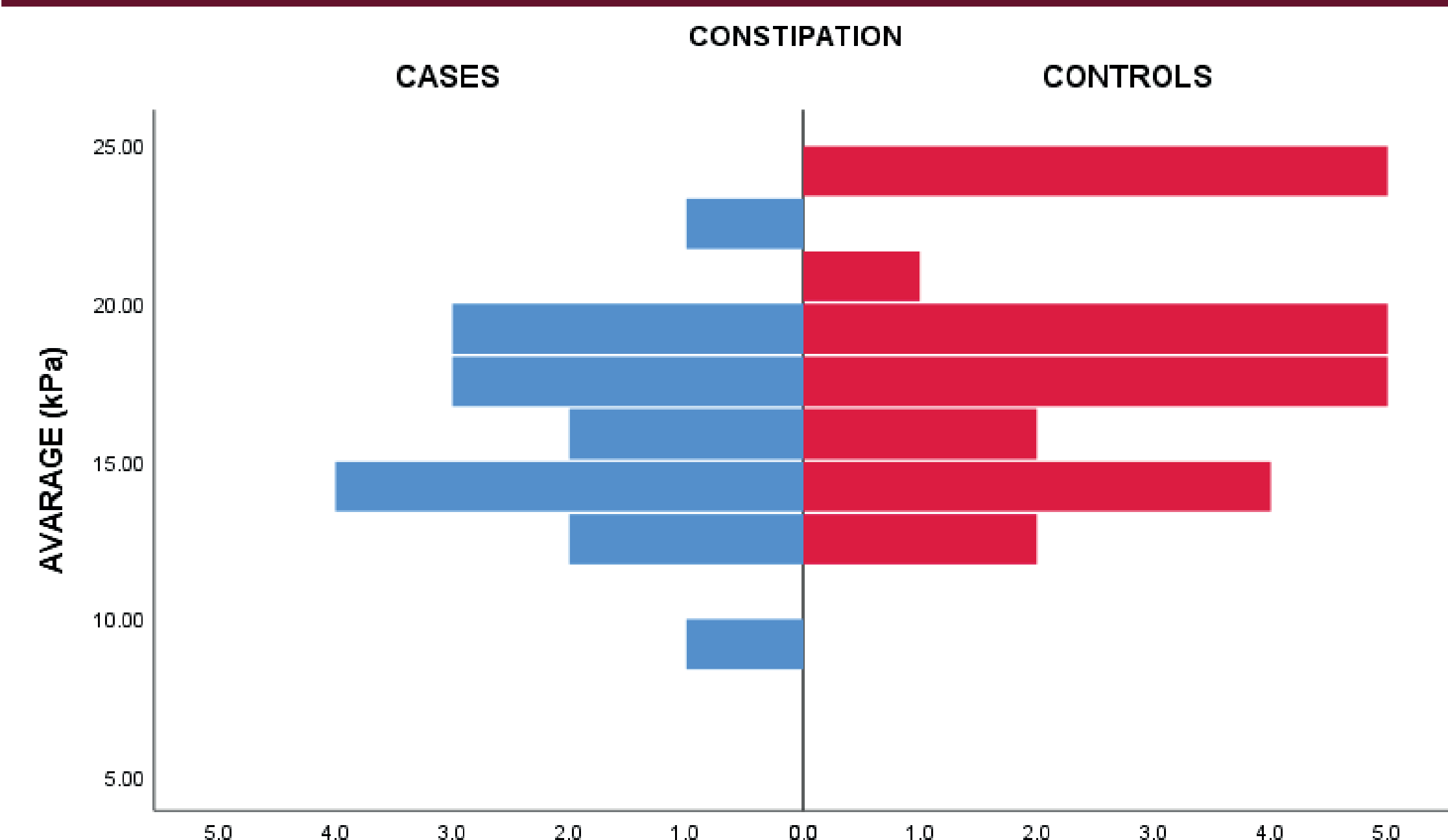


INTRODUCTION

The Levator Ani (LA) plays a crucial role in maintaining pelvic organ support and continence, However the puborectalis muscle (PR) often resulting from insufficient control in some conditions like pelvic floor dyssynergia, obstetric trauma, chronic constipation, etc. This study aims to evaluate the puborectalis muscle elasticity through shear-wave elastography (SWE) in posterior compartment disorders.

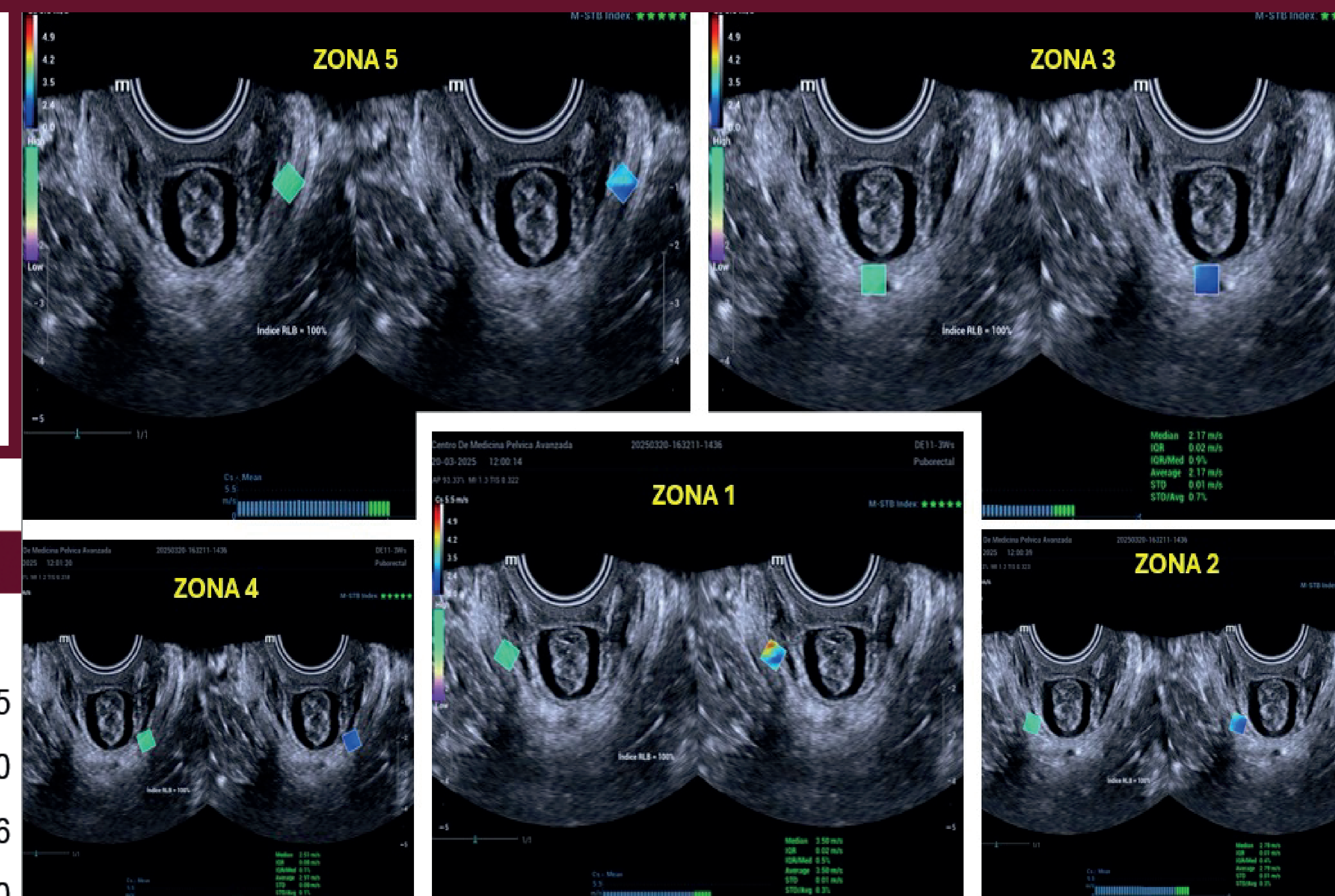
METHODS

Transperineal ultrasound and endovaginal (endocavitary) shear-wave elastography (SWE) were performed in patients with posterior compartment disorders and healthy volunteers previously evaluated through the Initial Measurement of Patient-Reported Pelvic Floor Complains Tool (IMPACT) for using the Fecal Incontinence Quality of Life (FIQOL) and Constipation Severity Instrument (CSI score). The puborectalis muscle was evaluated during rest, squeezing and valsalva maneuvers to assess the anatomy, dynamic angles and elasticity in kPascal (kPa). During the elastography mapping five zones were evaluated in the puborectalis muscle, referring to Zone 1 for the Right Insertion, Zone 2 for the Right Sling, Zone 3 for the body or U-shaped, Zone 4 for the Left Sling and Zone 5 for the Left Insertion. All measurements were analyzed, compared, and correlated (Pearson correlation coefficient) between groups.



AVERAGE ELASTOGRAPHY IN CONSTIPATION PATIENTS

	N	Minimum	Maximum	Mean	SD
ZONE 1	50	9.25	32.45	16.9612	5.54365
ZONE 2	50	8.89	29.75	17.0495	5.59210
ZONE 3	50	5.91	30.23	17.4770	6.00216
ZONE 4	50	5.54	31.43	15.3190	6.33650
ZONE 5	50	9.35	49.49	19.4490	8.75959



ELASTOGRAPHY

RESULTS

Among 100 patients who met the criteria, 50 cases (aged 60.12 years ($\pm$ 10.72 SD) and 50 controls (aged 55.67 years ($\pm$ 6.91 SD)). There was a significant difference in the CIS and FIQOL score between groups (15.76 ± 2.11 vs 8.10 ± 2.63 and 6.42 ± 3.26 vs 17.41 ± 2.65 , respectively). The mean value for cases and controls in Zone 1 was (17.77 kPa (5.56) vs 12.36 kPa (2.32), $P = 0.03$), for Zone 2 (17.12 kPa (5.12) vs 16.63 kPa (6.83), $P = 0.134$), for Zone 3 (18.73 kPa (6.91) vs 17.25 kPa (5.91), $P = 0.05$), for Zone 4 (15.69 kPa (4.56) vs 15.25 kPa (6.65), $P = 0.452$), for Zone 5 (19.74 kPa (8.74) vs 17.78 kPa (9.49), $P = 0.02$). The global mean value was 17.42 kPa (3.69) for cases and 16.23 kPa (3.69) for controls, ($P = 0.002$). The mean LPDA and ARA (Valsalva) was 29.38° (10.69) and 113.41° (21.30), respectively. A positive correlation was found between the difference in ARA (resting and valsalva) and global elastography, the Pearson correlation coefficient was 0.52 (moderate correlation).

DISCUSSION

There are several implications related to interpretation of PR tone with SWE. First, SWE measures of muscle tone reflect the combination of active and passive components, can be distinguish between them. Elevated tone of Kpas is considered a major factor in pelvic pain and obstructive problems and is a common target for treatment. Precise understanding of presence of elevated tone and whether active, passive or both components are involved could add precision to selection of treatment pathways. Transperineal SWE has potential advantages for patients with pelvic pain. The narrow EMG electrode designed for this study may reduce this impact problem.

CONCLUSION

Transperineal SWE is a noninvasive and feasible alternative method to evaluate the function of puborectalis muscle in posterior compartment disorders, providing comparable good outcomes with potentially reduced misinterpretations. Future studies should focus on large populations.

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