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PELVIC FLOOR MUSCLE STRENGTH USING VAGINAL DIGITAL ASSESSMENT COMPARED TO DYNAMOMETRIC MEASUREMENTS

Aims of Study

The pelvic floor muscles (PFM) play an important role in maintaining urinary continence, which explains why PFM assessment has been promoted by the International Continence Society as part of a routine examination for women complaining of lower-tract urinary symptoms [1]. Moreover, conservative treatments for stress urinary incontinence (SUI) are aimed at strengthening PFM. Clinicians currently use digital assessment to evaluate maximal PFM strength because it is quick and requires no equipment. This study attempts to compare PFM maximal strength evaluated by vaginal digital assessment with dynamometric measurements.

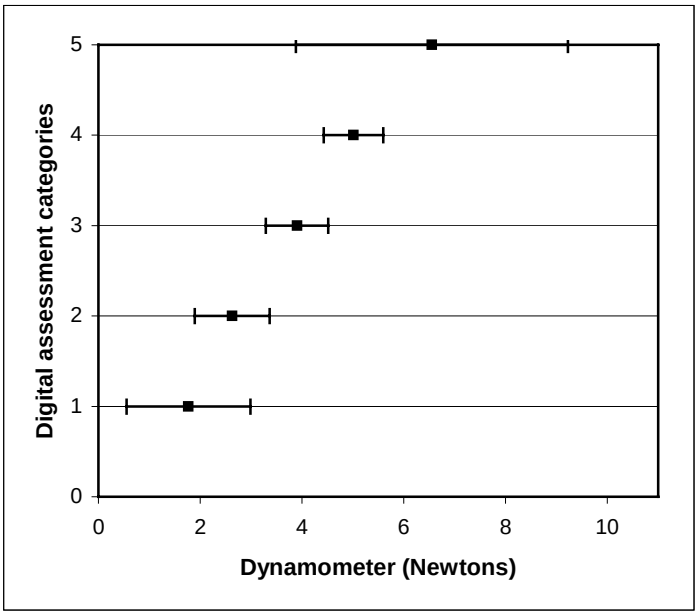
Methods

Thirty continent women and 59 women suffering from SUI, aged between 21 and 44, participated in the study. A 20-minute pad test was conducted to determine their continence status. They were evaluated in a supine lying position with hips and knees flexed, feet flat on a conventional gynecologist's table. After giving detailed instructions about contracting the PFM during the test, the evaluator, an experienced physiotherapist, assessed the maximal strength of the PFM by vaginal digital assessment using the modified Oxford grading system (6 categories, range 0-5). Dynamometric measurements were then obtained with a reliable instrumented speculum [2], which provides an accurate measure of the PFM resultant force regardless of its site of application on the branch of the speculum. The dynamometric assessment of the pelvic floor was conducted at minimal opening (5 mm between the two speculum branches) to reproduce the same vaginal aperture as with digital palpation. In preparation for the assessment, the subjects were instructed to relax their PFM in order to record a baseline value. They were then asked to contract for a 10 s period as they did in the digital assessment. The maximum strength value is obtained by subtracting the maximum peak value from the baseline value. Spearman's rho coefficients were calculated to assess the correlation between the dynamometric and the digital assessments. The mean maximal forces obtained for both groups with the instrumented speculum for each category of digital assessment were compared using ANOVAs.

Results

Significant correlations were found between the two measurements, with Spearman's coefficients of $r=0.727$, $r=0.450$ and $r=0.564$ for the continent, incontinent and all women, respectively ($p<0.01$). Dynamometric measurements obtained for the two groups of women showed significant overlaps between each digital assessment category (Figure 1). The ANOVAs indicated that force values differ across categories ($F= 10.08$; $p<0.001$), although contrast analyses revealed that the mean maximal forces do not differ between adjacent digital-assessment categories (1-2, 2-3, 3-4, 4-5). Mean force values differed significantly only between non-adjacent levels in the digital assessment such as 1-3, 1-4, 1-5, 2-4 and 2-5 ($p<0.05$).

Figure 1. Mean maximal forces with 95% confidence interval in the categories assessed by the Oxford grading system for all subjects.



For the two groups of women, the mean dynamometric measurements for each digital category are shown in Table 1.

Table 1 Dynamometric means for each digital assessment category

Digital Categories	**n**	**Dynamometric Means (Newtons)**	**95% Confidence Intervals**
1	8	1.8	1.2
2	15	2.6	0.7
3	31	3.9	0.6
4	33	5.0	0.6
5	2	6.5	2.7

Conclusion

Although the mean forces of the PFM increased across different categories of digital assessment, the force values between two adjacent categories do not differ. This limitation should be considered by clinicians and researchers when choosing treatment orientation and evaluating treatment outcomes.

References

1. Schull et al. in Abrams P, Khoury S, Wein A. (Editors). 2001. Incontinence. Second International Consulation on Incontinence. Paris.
2. Reliability of dynamometric measurements of the pelvic floor musculature using the Montreal dynamometer. Proceedings of the 2nd International Consultation on Incontinence 2001; Paris. p. 48.