Title: EVALUATION OF DYNAMIC MRI PELVIC FLOOR MEASUREMENT VARIABILITY IN A MULTICENTER TRIAL

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Text of Abstract

Introduction: To demonstrate dynamic MRI osseous and soft-tissue pelvimetry measurements and show limitations regarding variability between readers.

Methods: After IRB approval at six clinical sites and informed consent, primiparous women underwent dynamic ultrafast T2-weighted pelvic MR imaging at 6-12 months postpartum. The women consisted of three groups: vaginal delivery with anal sphincter tear (Group I); vaginal delivery without anal sphincter tear (Group II); and cesarean delivery without labor (Group III). Readers at clinical sites and a central reader measured 10 soft tissue and 9 osseous pelvimetry parameters. After additional standardized training, three readers re-interpreted 20 MRI studies. Measurement variability was assessed by intraclass correlation for agreement between the clinical site and central readers.

Results: There were 93 women in Group I, 79 in Group II, and 26 in Group III. For 8 of 19 MRI parameters on initial readings, there was adequate agreement (intraclass correlation (ICC) range 0.71-0.93). The remaining measurements had neutral or poor agreement (ICC range 0.13-0.66). 12 of 19 parameters had adequate agreement (ICC range 0.70-0.92) after additional training. Interobserver correlations were higher for bony measurements [ICC (5/9 and 8/9 variables $\geq$0.70, initial reads and re-reads, respectively] than for soft tissue measures (3/10 and 4/10, ICC$\geq$0.70, respectively).

Conclusion: There is high variability of pelvic MRI measurements between central and site readers despite standardized centralized training. Variability is higher for soft tissue structures than for osseous structures. Although somewhat improved with increased training, measurement variability may negatively affect application of pelvic MRI measurements for multi-center research.

Key Words: fecal incontinence, magnetic resonance imaging

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