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DEFINING 'NORMAL' ANATOMICAL AND FUNCTIONAL FINDINGS ON INTEGRATED TOTAL PELVIC FLOOR ULTRASOUND

Hypothesis / aims of study
Integrated total pelvic floor ultrasound (transvaginal, transperineal) has emerged as a new imaging modality to assess the pelvic floor dysfunction as an alternative to defaecatory imaging. However, 'normal' appearances must be understood before it can be useful for the assessment of pathology.

The aim of this study was to assess the pelvic floor anatomy in individuals with no pelvic floor symptoms.

Study design, materials and methods
A prospective observational case series of 20 asymptomatic female volunteers.

All women were screened with symptom questionnaires ((ICIQ-BS and ICIQ-VS (International Consultation on Incontinence Modular Questionnaire - Bowel and Vaginal Symptoms), B-SAQ (Bladder self-assessment questionnaire), ODS score (obstructed defaecation symptom), St Marks' faecal incontinence grade) to ensure they were asymptomatic prior to recruitment.

Each subject underwent assessment with;

- Integrated total pelvic floor ultrasound (transperineal, transvaginal, endovaginal, endoanal) performed as per previously published methods (1).
- Defaecation MRI performed in a closed configuration magnet to record the expulsion of rectal sonographic gel.

The presence and size or grade of rectocoele, enterocoele, intussusception, cystocoele, dyssynergy and poor propulsion was recorded for both imaging modalities. Bladder neck descent, anal sphincter integrity and levator plate integrity were assessed during integrated total pelvic floor ultrasound. Pattern of evacuation and incomplete evacuation was noted during defaecation MRI.

Results
There were 7 parous and 13 nulliparous women. Mean age was 37 years (range 22 - 53).

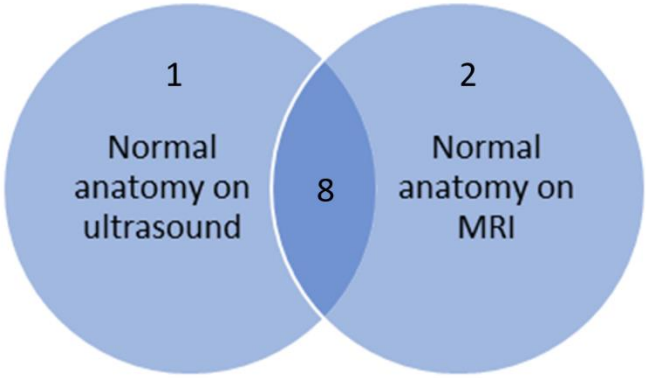
Anatomical deficits:
On integrated total pelvic floor ultrasound; there were 3 subjects who displayed a rectocoele (2cm, 2.5cm, 2.5cm), 3 with enterocoele (2 grade II, 1 grade III with relation to the vagina), 1 with intussusception (grade III), 8 with cystocoele (4 grade I, 4 grade II in relation to the vagina) and 5 with bladder neck descent 2cm or greater. The internal and external sphincter was intact for all subjects. Mean internal anal sphincter thickness was 1.9 (range 1 – 3.9). There were three subjects with mild levator plate damage.

On defaecation MRI; there were 3 with a rectocoele (2cm, 2cm, 2.6cm), 2 with enterocoele (grade II), 8 with cystocoele (7 grade I, 1 grade II). There were no cases of intussusception.

Overall, there were 8 cases with no anatomical defects on either imaging modality and 6 cases without any posterior pathology on either imaging modality but a cystocoele on either one or both scan. There were 6 cases with posterior pathology (one with enterocoele on both modalities, one with enterocoele and cystocoele on both, one with a rectocoele on ultrasound only, one with a rectocoele on MRI only and a cystocoele on both, one with a rectocoele on both and an enterocoele on ultrasound only and one with a rectocoele and cystocoele on both) (figure 1).
There were 2 with a rectocoele on both imaging modalities but the 2cm rectocoele visualised on ultrasound was not seen during MRI and the 2.6cm rectocoele seen on MRI was not visualised during ultrasound.
The two grade II enterocoeles visualised during ultrasound were also seen during MRI (both also grade II on MRI) but the grade III enterocoele seen on ultrasound did not develop during MRI.
There was one cystocoele which was seen on ultrasound (grade I) but not MRI and one seen on MRI (grade I) but not ultrasound. Grade of cystocoele was underestimated by MRI compared to ultrasound in four cases (grade II on ultrasound and grade I on MRI).

Functional deficits:
On integrated total pelvic floor ultrasound; there were 6 with dyssynergy and 3 with poor propulsion.
On defaecation MRI; there were 10 with dyssynergy, 7 with poor propulsion and 10 with incomplete evacuation.
Overall there were 10 with normal functional features and 4 with functional abnormalities on both modalities. There were 6 cases with abnormal functional features on MRI only (figure 2).

Figure 1 and 2: overlap for normal findings on the two modalities



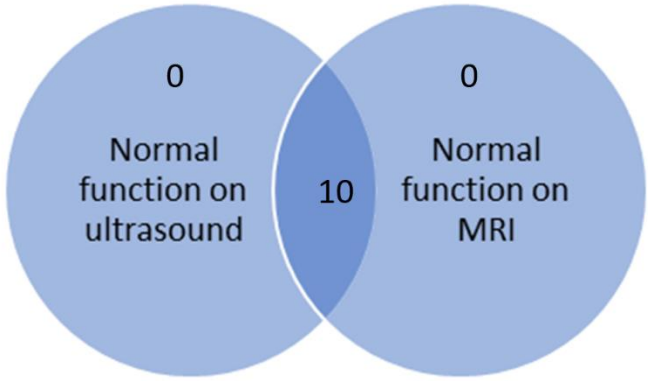


Table 1: anatomical findings in parous and nulliparous women

	parous	nulliparous
anatomy normal on ultrasound	0	9
anatomy normal on MRI	0	10
anatomy abnormal on ultrasound	7	4
anatomy abnormal on MRI	7	2

Interpretation of results

Comparing defaecation MRI with integrated total pelvic floor ultrasound has allowed us to refine our anatomical knowledge of ultrasound. There was agreement between the two imaging modalities for the presence or absence of anatomical abnormalities. However, severity of pathology did not always correspond. This may be related to the positioning of patients or the differences in the presence or absence of rectal contrast. Ultrasound tended to overestimate cystocoele compared to MRI (which may represent underestimation on MRI). Defaecatory MRI in a closed configuration system may overestimate functional abnormalities due to difficulty in expulsion of rectal gel in the supine position.

In this group of normal subjects with no bowel symptoms a significant number of anatomical abnormalities where identified on both investigation modalities. Clearly not all anatomical abnormalities cause symptoms. Due to difficulties with recruitment the cohort of women recruited was not a true representation of the population as most were nulliparous and pre-menopausal.

Concluding message

Not all anatomical abnormalities cause symptoms. The spectrum of ‘normal’ findings on imaging may be wider than previously appreciated and decision making for management based on imaging alone is unreliable and should be avoided. Possibly further work to identify why anatomical abnormalities cause symptoms in some people and not others is needed.

References

1. 1) Hainsworth AJ, Solanki D, Schizas AMP, Williams AB. Total pelvic floor ultrasound for pelvic floor defaecatory dysfunction: A pictorial review. British Journal of Radiology 2015;88(1055).

Disclosures

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