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THE ASSOCIATION OF LEVATOR PLATE DEFICIENCY WITH RECTOCOELE, INTUSSUSCEPTION, ENTEROCOELE, VAGINAL SYMPTOMS AND SYMPTOMS OF DEFAECATORY DYSFUNCTION

Hypothesis / aims of study

Levator ani deficiency is the gradient muscle loss of the levator ani which is caused by obstetric trauma and hormonal changes and associated with pelvic floor pathology. Pelvic floor defaecatory dysfunction includes incomplete evacuation, also termed obstructive defaecation, and may be caused by rectocoele, intussusception and enterocoele.

Levator ani deficiency has been widely implicated in anterior pelvic floor compartmental dysfunction. With regard to the posterior compartment, a greater levator plate descent angle has been shown to be more likely in those with obstructive defaecation compared to those without (1) and intussusception is more likely in those with a larger levator hiatal area (2).

To the author's knowledge there is no literature available regarding the correlation between symptom severity with the degree of levator ani deficiency, or the severity of anatomical abnormalities, with the degree of levator ani deficiency in women with pelvic floor defaecatory dysfunction. This is the first study which aims to ascertain whether symptom severity correlates with the degree of levator ani deficiency in defaecatory dysfunction. Secondary aims were to examine severity of anatomical abnormalities, namely rectocoele, intussusception and enterocoele, in relation to levator ani deficiency.

Study design, materials and methods

This is a prospective study of 107 females with pelvic floor defaecatory dysfunction referred to a tertiary colorectal pelvic floor unit; all of whom possessed some incomplete emptying with or without faecal incontinence and anterior compartmental symptoms. As part of their clinical assessment, all underwent endovaginal and transperineal ultrasound as well as symptom severity and quality of life scores.

Endovaginal ultrasound was performed using a BK 8838 axial type endoscopic probe with a 10 MHz transducer (B & K Medical, Sandhoften, Denmark) to obtain a 360 degree cross sectional image. Levator ani deficiency was scored as described by Shobeiri and colleagues whereby the left and right puborectalis, pubovisceralis and puboanalis were each scored (0 = no muscle loss, 1 = <50% muscle loss, 2 = >50% muscle loss and 3 = complete muscle loss) to give a total score 0 – 18 (0 – 6 mild, 7 – 12 moderate, 13 – 18 severe) (3).

This probe was also used to obtain dynamic posterior two dimensional views whilst asking the patient to squeeze up, bear down and cough. Intussusception was graded according to an ultrasonographic interpretation of the Oxford Radiological Classification used to grade intussusception during defaecatory imaging (grade I – V, ≥ grade III pathological).

Transperineal ultrasound was performed using a curved array probe (BK 8802 transducer, at 6 MHz). The transducer was rested on the perineum to obtain dynamic mid sagittal views whilst the subject was asked to squeeze up, bear down and cough. A rectocoele was the protrusion of the rectal wall beyond the perineal body into the vagina (≥1cm considered significant) and an enterocoele was the descent of small bowel into the rectovaginal space (grade I – III in relation to the vagina).

The interpretation of the imaging results was performed by two independent clinicians who were blinded to symptom severity scores.

The following symptom severity and Quality of Life (QoL) scores were collected; ICIQ – BS (International Consultation on Incontinence Modular Questionnaire – Bowel Symptoms), B-SAQ (Bladder control self-assessment questionnaire), ICIQ – VS (International Consultation on Incontinence Modular Questionnaire - Vaginal Symptoms), ODS score (obstructed defaecation symptom score), St Marks' faecal incontinence grading system and Thompsons constipation score.

Results

The mean age was 50 (median 50, range 23 – 84).
The mean, median and range for each of the symptom severity scores were as follows;

	ICIQ – BS	St Marks'	Thompsons	BSAQ	ICIQ - VS	ODS
Symptom score	11.4, 7 (0 – 36)	9.7, 8 (0 – 24),	2.1, 2 (0 – 3),	9.95, 10 (0 – 20)	4.54, 0 (0 – 30)	11.4, 7 (0-36)
QoL score	23.4, 17 (0 – 76),	19.7, 18 (0 – 44),	15.7, 17 (0 -25),	27.9, 28 (5 – 66)	7.8, 6 (0 – 37)	

The mean levator score was 5.2 (median 4, range 0 – 18) (73 mild, 31 moderate, 3 severe). There were 68 rectocoeles (mean size 1.8cm, median 1.5cm, range 1 – 4cm), 23 with intussusception (18 grade III, 2 grade IV and 3 grade V) and 24 with enterocoele (7 grade I, 13 grade II and 4 grade III).

There was a statistically significant positive correlation between vaginal symptom ICIQ - VS and symptom B-SAQ scores with increasing levator ani deficiency (Spearman's Rho 0.28, p = 0.0029; Spearman's Rho 0.19, p = 0.04). There was no association between any Quality of Life scores and the degree of levator ani deficiency.

There was a statistically significant positive correlation between the size of rectocoele and levator ani deficiency severity (Spearman's Rho 0.32, p = 0.001), the grade of intussusception and levator ani deficiency severity (Spearman's Rho 0.28, p = 0.0036) and grade of enterocoele with levator ani deficiency (Spearman's Rho 0.37, p = 0.005).

Those with a rectocoele had a greater degree of levator plate deficiency than those without a rectocoele (levator ani deficiency score 12 versus 4.3, unpaired two tailed T test ($p<0.0001$). Those with an enterocoele also had a greater degree of levator plate deficiency than those without an enterocoele (levator ani deficiency score 11.5 versus 4.4, unpaired two tailed T test ($p<0.0001$)). There was no significant difference in the levator ani deficiency scores of those with or without intussusception.

Interpretation of results

Increasing levator ani deficiency is associated with increasing symptom severity for vaginal and bladder symptoms but not for any of the symptoms associated with defaecatory dysfunction. Worsening levator ani deficiency is also associated with increasing size of rectocoele, increasing grade of intussusception and grade of enterocoele. Those with a rectocoele or an enterocoele have a greater degree of levator ani deficiency than those without. The worsening vaginal symptoms may be due to increasing rectocoele size.

Concluding message

Levator ani deficiency is associated with worsening anterior compartmental symptoms but not posterior compartmental symptoms. However, levator ani deficiency is associated with a greater degree of posterior compartmental anatomical abnormalities which are thought to cause pelvic floor defaecatory dysfunction.

References

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