

EXTERNAL URETHRAL SPHINCTER ELECTROMYOGRAPHIC ACTIVITY (EMG) IN ASYMPTOMATIC WOMEN AND THE INFLUENCE OF THE MENSTRUAL CYCLE.

Hypothesis / aims of study

In 1985 Clare Fowler firstly described a specific electromyographic activity (complex repetitive discharges CRDs and decelerating burst DBs) in the external urethral sphincter of women with idiopathic urinary retention [1]. While CRDs and DBs are reported in up to 85% among these women, studies have reported CRDs and DBs in women without voiding lower urinary tract symptoms (8% up to 30%) [2]. Historically, idiopathic urinary retention was suggested to be associated with a hormonal disorder. Additionally, preliminary results from our institution suggested a putative relationship with the menstrual cycle, with CRDs and DBs recorded preferentially in the second half of the menstrual cycle [3]. The present study was undertaken to further investigate the external urethral sphincter during the menstrual cycle.

Study design, materials and methods

In a pilot observational study, healthy female volunteers aged 20 to 40 years old with predictable menstruation cycle were recruited between February and December 2012. Exclusion criteria were: use of any sexual hormone, pregnancy, body mass index higher than 35 kg/m², past history of pelvic disease, urinary infection, voiding lower urinary tract symptoms (LUTS) on questionnaire, maximum urinary flow rate of less than 12 ml/sec and post void residual of more than 50 ml. Interventions were external urethral sphincter concentric needle electromyography (EMG) at early follicular phase (EF) and at mid luteal phase (ML). Progesterone and oestradiol levels were measured. Outcome was incidence of sustained CRDs or DBs (scale III to V according to Fowler) at different time of the menstrual cycle.

Results

119 volunteers enquired about the study, 16 were screened for eligibility and enrolled. Median age was 30 years old, none reported voiding LUTS, median BMI was 25, maximum urinary flow rate ranged 15-50 ml/sec, post void residual ranged 0-20 ml. 1 participant was lost before intervention, 13 completed the study, 2 underwent only one EMG recording, 1 at EF, 1 at ML. 3 participants had EMG recording at early luteal phase (EL) instead of ML due to an unpredictably longer menstrual cycle. Among the 10 participants accurately investigated, 5 (50%) were positive at ML, from which two were also positive at EF. None of the participants was positive at EF only. In total regardless of the timing of menstrual cycle 6 participants (40%) had a positive test.

Participants	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
EMG at EF	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-
EMG at ML	+	-	-	+	+	-	-	+	+	-	-	-	-	-	-
EMG at EL											-	+	-		

EMG=Concentric needle electromyography of external urethral sphincter. EF= early follicular phase. ML= mid luteal phase. EL= early luteal phase. += Presence of complex repetitive discharges (CRDs) and decelerating bursts (DBs). - = Absence of CRDs and DBs

Interpretation of results

Despite a small cohort, this study has shown for the first time that CRDs and DBs activity may vary during the menstrual cycle and there is a tendency to 'abnormal' activity in the mid luteal phase. Our data support that CRDs and DBs activity is not uncommon in women without voiding LUTS.

Concluding message

This study gives a new insight in the urethral physiology. Further works are mandatory to investigate whether CRDs and DBs could be coincidental in women with idiopathic urinary retention, and reproducible in women without voiding LUTS.

References

1. Fowler CJ, Kirby RS & Harrison MJ 1985 Decelerating burst and complex repetitive discharges in the striated muscle of the urethral sphincter, associated with urinary retention in women. J Neurol Neurosurg Psychiatry 48 1004-1009.
2. Ramm O, Mueller ER, Brubaker L, Lowenstein L & Kenton K 2012 Complex repetitive discharges--a feature of the urethral continence mechanism or a pathological finding? J Urol 187 2140-2143.
3. Kujawa ML, Reid F, Ellis A, Clarke NW, Betts CD 2001 Are 'whaling' women normal? BJUI 88 s1 82

Disclosures

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