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EFFECT OF ANTENATAL PELVIC FLOOR EXERCISES ON BLADDER NECK DESCENT IN NULLIPAROUS PREGNANT WOMEN

Hypothesis / aims of study
Pelvic floor muscle exercises (PFME) are commonly recommended during pregnancy and after birth both for prevention and for treatment of LUTS. Stress urinary incontinence has long been presumed to be associated with urethral hypermobility. Pregnancy and delivery are known to contribute to increased bladder neck descent (BND). This study aimed to determine the effect of antenatal PFME on bladder neck descent in nulliparous pregnancy.

Study design, materials and methods
From February 2008 to June 2010, 219 nulliparous pregnant women between 5-12 weeks were interviewed and underwent perineal ultrasound at a tertiary antenatal clinic. 108 women were randomised to a PFME group, and 111 women to a non-PFME group. The latter received routine antenatal care. In the intervention group, patients were taught PFME using visual biofeedback by perineal ultrasound, The PFME regimen comprised a series of 15 contractions each held for 5 seconds, with 5 seconds rest between each contraction. Patients were asked to repeat this regimen 3 times after each meal. At 6 months postpartum, both groups were interviewed and underwent another ultrasound assessment. Perineal ultrasound was performed after bladder emptying, with the patient in the supine position. Bladder neck position was measured at rest and on maximal valsava, and the differences yielded a numerical value for BND (1). The sample size was calculated with a power of 80%. P< 0.05 was considered significant. SPSS 15.0 for windows (SPSS Inc, Chicago, Illinois) was used for statistical analysis.

Results
Demographic characteristics did not differ significantly between PFME and non - PFME group, showing effective randomisation. Mean age was 27.0±3.9 and 26.5±5.4 years in PFME and non-PFME group, respectively (P=0.49). There were no significant differences in bladder symptoms between the two groups at the first visit. In the first trimester, the average BND of the PFME group was slightly higher than BND of the non-PFME group (14.1±7.0 mm. and 12.2±6.9 mm. respectively (P=0.04)). At 6 months postpartum, 80 women of the PFME group and 65 women of the non-PFME group returned for follow-up. There were no differences regarding the prevalence of LUTS between the groups at 6 months after delivery (Table 1). When compare the route of delivery by using Pearson's chi-square test, there was no statistical different between two groups (P=0.35). The mean fetal birth weight of the women in PFME group was 3121.2 grams and in the non-PFME group was 3100.0 grams (P=0.75). Women in the non-PFME group had a higher BND than those in the PFME group. This difference was also found in the subgroup of the women who delivered vaginally (Table 2). In the PFME group, the mean difference between BND at first trimester and 6-month postpartum was - 0.29 mm. whereas the mean difference in non-PFME group was 4.21 mm. (P<0.0001).

Table 1: Mean rank of bladder symptom score at 6-month postpartum

Bladder symptoms	Pelvic floor muscle exercise		P-value
	PFME group	Non-PFME group	
Urinary frequency	74.41	72.37	0.65
Nocturia	74.98	71.65	0.44
Urge incontinence	72.5	74.75	0.11
Stress incontinence	73.3	73.75	0.82

Mann Whitney U-test, P < 0.05

Table 2: Comparison of BND between PFME and non-PFME groups

	Pelvic floor muscle exercise		P-value
	PFME group	Non-PFME group	
BND-P6* (mean+SD,mm.), (n)	13.8±7.3 (80)	16.4±6.6 (65)	0.03
BND-P6-V** (mean+SD,mm.),(n)	13.2±7.4 (46)	17.5±6.9 (43)	0.006

Independent t-test, P < 0.05
* BND at 6-month postpartum
** BND at 6-month postpartum in women delivered vaginally.

Interpretation of results
The intervention tested in this study had no effect on the prevalence of lower urinary tract symptoms at 6 months postpartum. However, women in the intervention group had a significantly lower BND at 6-month postpartum. They showed largely unchanged bladder neck descent compared to the non- intervention group, who had significantly increased BND postpartum,

especially in those women who delivered vaginally. The findings in the non- intervention group are consistent with the literature (2, 3)

Concluding message

Although the postpartum prevalences of LUTS were no different between groups, this study has demonstrated that antenatal pelvic floor muscle exercises may reduce bladder neck mobility at 6 months after childbirth. The significance of such an effect remains to be determined.

References

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Specify source of funding or grant	**Thammasat University**
Is this a clinical trial?	**Yes**
Is this study registered in a public clinical trials registry?	**No**
Is this a Randomised Controlled Trial (RCT)?	**Yes**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**The ethical committee of Faculty of Medicine, Thammasat University**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**