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EFFECT OF ANTENATAL PELVIC FLOOR MUSCLE EXERCISES IN PREVENTION AND TREATMENT OF URINARY INCONTINENCE: A RANDOMIZED CONTROLLED TRIAL

Hypothesis / aims of study
Pelvic floor muscle exercise (PFME) has been documented in the literature to be one of the treatment methods for urinary incontinence during pregnancy; however, studies on the efficacy of PFME done in this antepartum period are rather limited. This study was conducted a randomized controlled trial to evaluate the effect of an intensive antenatal pelvic floor muscle exercise PFME in prevention and treatment of urinary incontinence during pregnancy and after birth.

Study design, materials and methods
Women were recruited to the randomized trial from April, 2008 to October 2008 and followed up until October 2009. In this period, 300 nulliparous pregnant women attending an antenatal clinic at 16 to 24 weeks of gestation were randomly assigned to 2 groups. The study group was trained by a physiotherapist on how to do PFME; the control group was given routine antenatal care without PFME. The exercises comprised 3 repetitions of 8 contractions each held for 6 seconds, with 2 minutes rest between repetitions.[1] These were repeated twice daily and lasted through out a 12 weeks' period. Urinary incontinence symptoms of both groups were measured by 2 questionnaires, Urogenital Distress Inventory-6 (UDI-6) and incontinence impact questionnaire-7 (IIQ-7), at entry and 36 week's gestation, and 3 days, 6 weeks and 6 months postpartum. Besides, we wanted to investigate the prevalence of urinary frequency and urinary incontinence during pregnancy and postpartum. So all women were asked 2 questions: "Gone to the toilet more than 7 times during the day" and "Do you leak urine at any time: never, seldom, weekly or daily?" Urinary frequency and urinary incontinence were registered both in accordance with the International Continence Society's definitions. Questionnaire scores were compared and analyzed.

Results
Urine leakage related to urgency and physical activity listed in the UDI-6 questionnaire, and the IIQ-7 questionnaire showed significant differences between the exercise group and the control group during late pregnancy and postpartum period (**Table** 1). The incidence of self-reported urinary incontinence between exercise and control groups was analyzed by Generalized Estimating Equations; the exercise group had a significantly lower urinary incontinence rate than the control group [odds ratio = 1.63, $P < 0.05$]. Likewise, by Generalized Estimating Equations, the incidence of self-reported urinary incontinence between vaginal and caesarean delivery groups was compared and the result showed that in the postpartum period vaginal delivery was associated with a significantly higher urinary incontinence rate than caesarean delivery [odds ratio = 4.89, $P < 0.05$].

Table 1 Comparison of UDI-6 and IIQ-7 score between exercise group and control group

Questionnaire	Exercise	Control	*P* value
UDI-6[a]	1.27±1.54	1.36±1.55	0.49
UDI-6[b]	3.44±3.26	4.66±3.32	<0.01
UDI-6[c]	1.42±2.04	2.31±2.16	<0.01
UDI-6[d]	0.81±1.36	1.54±1.59	<0.01
UDI-6[e]	0.35±0.84	0.86±1.14	<0.01
IIQ-7[a]	1.11±2.47	1.21±2.44	0.18
IIQ-7[b]	3.77±6.01	5.28±5.61	<0.01
IIQ-7[d]	1.73±3.57	2.86±3.52	<0.01
IIQ-7[e]	0.77±2.07	1.56±2.20	<0.01

Data are presented as mean ± standard deviation,
Calculated with the Wilcoxon signed-rank test
[a]: Pregnancy at 16 to 24 weeks, [b]: Pregnancy at 36 weeks, [c]: 3 days after delivery,
[d]: 6 weeks after delivery, [e]: 6 months after delivery

Interpretation of results
The results showed that PFME leads to treatment of urinary incontinence and improvement of quality of life in late pregnancy and up to 6 months postpartum. The delivery method itself also played a role in this regard: Our study found patients delivered through vaginal route were more inclined to develop postpartum urinary incontinence than delivered by caesarean section.

Concluding message
PFME applied in pregnancy is a quite effective in the treatment of and reduction in urinary incontinence during pregnancy and this effect may persist to the postpartum period.

References
1. Bo K. Pelvic floor muscle exercise for the treatment of stress urinary incontinence. An exercise physiology prospective. Int Urogynecol J 1995;6:282-91

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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	**Chang Gung Memorial Hospital at Linkou, Taiwan**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**