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Common errors made in attempt to contract the pelvic floor muscles in women early after delivery: A prospective observational study



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ABSTRACT

Objectives: The ability to perform a correct pelvic floor muscle contraction (PFMC) is necessary to start pelvic floor muscle training after delivery. COMMOV are "c"ontractions of "o"ther "m"uscles (m. rectus abdominus, the gluteal muscles, and the adductors), and other "mov"ements (pelvic tilt, breath holding, and straining) performed in addition to or instead of the PFMC. COMMOV are probably the most common errors in attempt to contract the pelvic floor muscles during the first days after delivery. The aims of this study were to observe the prevalence of COMMOV, to investigate whether COMMOV influence the ability to perform a PFMC, and whether verbal instructions are effective to unlearn the COMMOV postpartum. **Study design:** A Prospective Observational Study was performed in women during the first through sixth day postpartum. PFMC and COMMOV were evaluated with visual observation. Women who did not show correct isolated PFMC received verbal instructions and were re-evaluated. Interobserver variability and agreement were calculated. Chi-square, Kappa, Risk Ratio, and McNemar were used. **Results:** A total of 382 women participated, 2.36 (± 1.2) days postpartum. Twohundred sixteen, 57%, CI (52–62%), showed COMMOV. The chance to perform a correct PFMC was 2.65 times higher without COMMOV ($p = 0.0001$). Verbal feedback was effective (57% reduced to 3%) to abandon COMMOV during PFMC.

Conclusion: COMMOV are common errors performed during attempts to contract the pelvic floor muscles after delivery. They can reduce the ability to contract the pelvic floor muscles, but can easily be unlearned with visual observation and verbal feedback.

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Introduction

Symptoms related to pelvic floor dysfunction (PFD) including urinary incontinence (UI), fecal incontinence (FI), pelvic organ prolapse, and sexual problems are common in women. They can impose a significant burden [1] and are associated with high cost of additional care [2]. Pregnancy and childbirth are two of the most important causal factors of PFD [3]. Up to 64% of pregnant women experience UI during pregnancy [4], about a third have UI after childbirth, and up to 10% have FI [5,6].

Pelvic floor muscle training (PFMT) is recommended as first-line treatment peripartum for both prevention and treatment of UI and FI [5,7,8]. One-to-one PFMT for prolapse was shown to be effective for improvement of prolapse symptoms [9].

But prior to starting PFMT, the importance of an assessment of the pelvic floor muscle contraction (PFMC) has been emphasized [8]. This becomes necessary since up to 30% of women are unable to perform a correct PFMC during their first attempt [10]. Visual observation of the inward movement of the pelvic floor muscles (PFM) is effective to evaluate the PFMC and verbal feedback to improve the PFMC, have a positive effect [10,11].

An isolated submaximal voluntary contraction of the PFM is possible, while a maximal PFMC most likely results in co-contraction of transversus abdominis and the obliquus muscles [12,13]. Common errors have been registered during attempts to contract the PFM: some women (co-)contract the gluteal muscles,

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hip adductors, or abdominal muscles [14] or stop breathing, perform a pelvic tilt or straining. But, to the best of our knowledge, there is no consensus found as to whether these "c"ontractions of "o"ther "m"uscles (gluteal muscles, adductors, rectus abdominus) and common "mov"ements (breath holding, pelvic tilt, straining) (COMMOV) performed in addition to or instead of a PFMC are supportive or rather an impediment to the performance of a PFMC. Although they could disturb the woman's sensory awareness and the proprioception of the PFM [13].

It has been shown that an early start of PFMC after delivery is advisable to prevent and treat PFD [15]; and performing PFMC immediately after childbirth does not cause any burden or pain [16].

The aims of this study are to examine COMMOV performed in addition to or instead of the PFMC immediately after childbirth, to investigate whether they influence the performance of a PFMC, and whether verbal feedback is effective to unlearn COMMOV.

Materials and methods

A prospective observational study was performed in women early after delivery to study the prevalence and influence of COMMOV on PFMC. Effectiveness of verbal feedback was studied with a pretest and posttest design evaluating COMMOV before and after verbal feedback. Women were recruited postpartum (day 1–6) during their stay in the Antwerp University Hospital. Good knowledge of Dutch, French, or English language was a prerequisite for inclusion. Exclusion criteria were the presence of an indwelling bladder catheter and a newborn in critical condition. Written informed consent was obtained from all participating women. The study was approved by the local ethics committee (B300201422643).

Age, weight before pregnancy and on the day of the delivery, body height, gravidity, and parity of the participants were gathered from the medical records. A physiotherapist experienced in women's health asked the women whether they experienced perineal pain (Visual Analogue Scale), UI before and during pregnancy, had hemorrhoids, ever received information about PFM, ever previously learned a PFMC, and whether they felt afraid to exercise due to pain.

Information about PFM anatomy and functions and the possible consequences of pregnancy and delivery was given. The meaning of the squeezing contraction and the necessity of an internal displacement during PFMC were explained. Instructions on how to perform a PFMC were given by the description "squeeze and lift your PFM as if trying to stop the flow of urine."

The evaluation was done in the supine position, with hips and knees bent, soles flat on the same level of the trunk, in the hospital bed. All clothes of the lower body were removed. In order to respect the setting early after delivery, PFMC were evaluated with a validated visual observation on a three-grade scale (grade 0 = no movement; grade 1 = weak movement; grade 2 = strong inward displacement/lift of perineum). Grade 2 was accepted as sign of a correct PFMC [10]. Concomitantly contracting m. rectus abdominus, the gluteal muscles, and the adductors, or a pelvic tilt, breath holding and straining were considered to be COMMOV. The performance of COMMOV was also evaluated with visual observation. Women who did not show correct isolated PFMC, or who performed COMMOV, received more detailed verbal instructions on how to contract the PFM specifically without the concomitant contraction of the m. rectus abdominus, the gluteal muscles, and the adductors, without tilting their pelvis or straining and while they were continuing to breath normally. They were re-evaluated afterwards.

The observation was done while the women performed nine consecutive contractions, with evaluation and feedback after three,

and nine attempts to contract PFM. Women were asked if they felt the PFM contracting.

In 32 women, the evaluation and scoring of PFMC and COMMOV through visual observation was done simultaneously by two independent observers (physiotherapists) to determine interobserver variability.

Sample size was counted on the aim to estimate the prevalence of COMMOV. With 329 patients, one can estimate a prevalence of 50% COMMOV with a precision of 7% (95% confidence interval). Level of significance was chosen on 0.05. Statistical analysis was carried out using SPSS version 24.0 for Windows. Descriptive statistics, Risk ratio, Wilcoxon, McNemar, Kappa statistics and Chi-Square tests were used.

Results

Three hundred eighty-two (199 primiparous; 183 multiparous) women participated in the study immediately after delivery, 2.36 (± 1.2) days postpartum. Descriptive statistics of the demographic characteristics and the data obtained through questioning about perineal pain, hemorrhoids, UI, and information about PFM and exercises are presented in Tables 1 and 2.

Sixty-six percent of all participants were informed about PFM before, 65 (25%) through pregnancy information evenings, 53 (21%) through prenatal physiotherapy, and 74 (29%) when having an earlier delivery. Table 3 presents the influence of parity on the information women already received before delivery. Significantly more multiparous women were informed about PFM, learned PFM exercises before delivery, and had been controlled during a PFMC.

At the first evaluation 224 [59%, CI (54–64%)] women performed a correct PFMC, 69 [18%, CI (15–23%)] were not able to contract the PFM. After one or two sessions of verbal feedback, only two women scored zero on PFMC, 341 [90%, CI (86–92%)] performed a correct PFMC. Table 4 presents the prevalence of PFMC immediately after childbirth, obtained through verbal feedback.

The prevalence of COMMOV is also presented in Table 4. Two hundred sixteen women [57%, CI (52–62%)] performed at least one of the following COMMOV: contraction of m. rectus abdominus, the gluteal muscles, the adductors, or a pelvic tilt, breath holding or straining. Contraction of the m. rectus abdominus [n = 131; 35%, CI (30–40%)], breath holding [n = 123; 33%, CI (28–38%)] and contraction of the gluteal muscles [n = 84; 22%, CI (18–27%)] were the most common.

If COMMOV were observed the ability to perform a correct PFMC was significantly ($p = 0.0001$) lower. Of 216 (57%) women with COMMOV, only 75 (20%) showed a correct PFMC. The chance for a correct PFMC is more than doubled in the absence of COMMOV (RR = 2.65).

Table 1
Participant's demographic characteristics (N = 382).

	Mean (\pm SD)	Range (MIN-MAX)
Participants characteristics		
Days postpartum	2.36 (± 1.16)	0–7
Age (years)	30.74 (± 4.91)	16–44
Weight before pregnancy (kg)	65.81 (± 11.66)	42–118
Weight before delivery (kg)	79.05 (± 13.31)	49–133
Weightgain (kg)	13.00 (± 6.35)	0–35
Body Height (cm)	166.57 (± 6.81)	148–186
BMI before pregnancy	23.68 (± 3.84)	17.0–39.4
Gravidity	2.02 (± 1.31)	1–12
Parity	1.68 (± 0.95)	0–9

BMI = Body Mass Index, SD = Standard Deviation, Min = minimum, Max = Maximum.

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