The effect of mediolateral episiotomy at delivery on pelvic floor muscle strength evaluated with vaginal cones

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In a prospective study, pelvic floor muscle strength was investigated pre- and post partum in 87 women with uncomplicated pregnancies. Those vaginally delivered were 71 primiparas, while 16 underwent an elective cesarean section. The objective was to evaluate the effect of the delivery procedure on the pelvic floor muscle strength with the aid of vaginal cones. In the group of women with vaginal delivery three subgroups were identified: episiotomy, spontaneous laceration and intact perineum. Pelvic floor muscle strength was weakest in the episiotomy subgroup, the difference in values between this subgroup and each of the other subgroups and the elective cesarean section group being significant. No significant difference was evident between the spontaneous lacerations and intact perineum subgroups.

Key words: delivery, perineal trauma, pelvic floor muscles, vaginal cones

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The pelvic floor muscles are more or less impaired post partum, which may lead to such disorders as urinary incontinence and uterine prolapse. Episiotomy (Ep) has therefore been widely advocated to prevent pelvic floor relaxation, especially among primiparas. Three benefits of a liberal use of Ep have been postulated: first, prevention of damage to the anal sphincter and rectal mucosa; second, prevention of trauma to the fetal head; and third, prevention of damage to the pelvic floor muscles (1-2). Despite the common use of Ep there are few data to support the premise that this procedure prevents pelvic floor relaxation (3).

Various methods have been used for evaluation of pelvic floor muscle strength (PFMS): cuffed catheters, perineometry, and digital tests (4-8).

The purpose of this study was to evaluate the effect of parturition on pelvic floor muscle strength (PFMS), with the aid of vaginal cones.

Participants

The series comprised 92 women, consisting of every second mother attending the maternity clinic in the 36th gestational week, planned for either vaginal delivery (n=76) or ECS (n=16). All had an uncomplicated pregnancy. Five of the women scheduled for vaginal delivery were excluded from the...
Table 1. Maternal weight, obstetric and infant data in the vaginal delivery subgroups (Ep.SL,IP) and ECS group

<table>
<thead>
<tr>
<th></th>
<th>Ep (n = 21)</th>
<th>SL (n = 26)</th>
<th>IP (n = 24)</th>
<th>ECS (n = 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal weight (mean kg)</td>
<td>61</td>
<td>63</td>
<td>62</td>
<td>60</td>
</tr>
<tr>
<td>Weight gain during pregnancy (mean kg)</td>
<td>14</td>
<td>15</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Mode of delivery:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- labor stage I (mean h)</td>
<td>16</td>
<td>13</td>
<td>15</td>
<td>-</td>
</tr>
<tr>
<td>- labor stage II (mean min)</td>
<td>34</td>
<td>31</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>- spontaneous delivery</td>
<td>n = 17</td>
<td>24</td>
<td>24</td>
<td>-</td>
</tr>
<tr>
<td>- vacuum extraction</td>
<td>n = 4</td>
<td>2</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Apgar score:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 min ≤7</td>
<td>n = 1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1 min ≥8</td>
<td>n = 20</td>
<td>24</td>
<td>23</td>
<td>14</td>
</tr>
<tr>
<td>5 min ≤7</td>
<td>n = -</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>5 min ≥8</td>
<td>n = 21</td>
<td>25</td>
<td>24</td>
<td>15</td>
</tr>
<tr>
<td>Birthweight (mean g)</td>
<td>3596</td>
<td>3640</td>
<td>3366</td>
<td>3190</td>
</tr>
<tr>
<td>Child head circumference (mean cm)</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
</tbody>
</table>

study; 2 changed their mind during pregnancy and 3 had an emergency section. All women were comparable with regard to bodyweight and weight gain during pregnancy (Table I).

Methods

In all cases, the (PFMS) was evaluated with the aid of vaginal cones (Fig. 1). The vaginal cone set consists of nine cones with the weights increasing in 10-g steps from 20 to 100 g. The PMFS was defined as the weight in grams of the heaviest cone retained in the

Fig. 1. A set of 9 standardized vaginal cones with weights increasing in 10 g stages from 20 to 100 g (numbers 1-9)
Pelvic floor evaluated with vaginal cones

asphyctic fetuses in 4 and prophylactically due to a rigid perineum in 4 women. Asphyxia was the indication for vacuum extraction in 2 women, one each in the Ep and SL subgroups. The other four vacuum extractions were to facilitate the second stage of labor. Damage of the anal sphincter but with intact rectal mucosa was registered in 2 women in the Ep subgroup and in one in the SL subgroup. The three subgroups were similar with regard to obstetrical data (Table I).

Table II. Mean PFMS (g, ± SD) pre- and post partum in the vaginal delivery subgroups and the ECS group

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Mean PFMS 36 weeks</th>
<th>Mean PFMS 8 weeks</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ep (n = 21)</td>
<td>91.4 ± 10.6</td>
<td>61.4 ± 13.5</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>SL (n = 26)</td>
<td>90.4 ± 9.6</td>
<td>71.5 ± 10.8</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>IP (n = 24)</td>
<td>94.2 ± 9.3</td>
<td>75.0 ± 11.4</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>ECS (n = 16)</td>
<td>91.9 ± 8.3</td>
<td>91.9 ± 8.3</td>
<td>NS</td>
</tr>
</tbody>
</table>

NS = non-significant.

Objective data of PFMS pre- and post partum

ECS did not result in any change in the PFMS when the test value in the 36th week of gestation was compared with the value obtained 8 weeks post partum. On the other hand, PFMS was significantly impaired in all women delivered vaginally. The results of the pre- and post partum PFMS tests are summarized in Table II.

The PFMS in the Ep subgroup was significantly decreased 8 weeks post partum when compared with the subgroups SL and IP. No significant difference in PFMS was registered between the SL and IP subgroups (Table III).

Table III. Mean decrease in PFMS for the three subgroups and the ESC group at 8 weeks post partum

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Mean decrease in PFMS (g) ± SD</th>
<th>Vaginal delivery</th>
<th>ECS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ep (n = 21)</td>
<td>30.0 ± 11.8</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SL (n = 26)</td>
<td>18.9 ± 9.1</td>
<td>p&lt;0.001</td>
<td>X</td>
</tr>
<tr>
<td>IP (n = 24)</td>
<td>19.2 ± 10.2</td>
<td>p&lt;0.01</td>
<td>NS</td>
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<tr>
<td>ECS (n = 16)</td>
<td>0.0</td>
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Results

Obstetric data

The study was completed by 87 women. Those vaginally delivered were 71 primiparas aged 18–38 (mean 26 years) and 16 women aged 20–41 (mean 31 years) were delivered by ECS (no previous vaginal deliveries). At the vaginal deliveries, three subgroups were identified, viz. mediolateral episiotomy (Ep), spontaneous lacerations (SL) and intact perineum (IP). Ep was performed in 21 (30%), SL in 26 (36%) and IP in 24 (34%). Indications for Ep were to facilitate the second stage of labor in 13 women;

Discussion

The present findings show that PFMS was most decreased in the Ep subgroup. The reason for this might be that Ep is a more traumatic event than SL, or that the women in this subgroup had a more traumatic delivery, which is not supported by the data in Table I. The first theory agrees with findings in a previous study (9) in which women with Ep more often needed sutures and suffered wound infections, and experienced a longer duration of wound healing than women with SL. Some other investigators (3, 10–12) have, moreover, suggested

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vagina for one minute while the patient was standing erect, or walking. All subjects were initially tested in the 36th week of gestation. The test was repeated 8 weeks post partum.

Informed consent was given by all participants, and the study was approved by the Medical Ethics Committee of Huddinge University Hospital.

Statistics

Student’s t-test and the χ²-test were used for statistical evaluation.
that women with Ep may run a greater risk of serious
damage to the pelvic floor, with its possible conse-
quences and that Ep ought to be more restrictively
used in uncomplicated deliveries.

In a recent publication, Sleep et al. (2) also dis-
tinctly stated that there is no evidence of benefit to
support a policy of liberal use of Ep in normal deliv-
eries.

In agreement with Sleep et al. (2), the present
results do not support the concept that Ep reduces
the risk of damage to the pelvic floor muscles. It was
also found that vaginal cones are suitable for the
objective evaluation of PFMS. We therefore recom-
mend the use of vaginal cones to test the PFMS at
the postnatal check-up. This provides the woman
with an objective indication of her PFMS, which
might encourage her to do subsequent pelvic floor exer-
cises.

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