OBSTETRICS

Effect of dyssynergic defecation during pregnancy on third- and fourth-degree tear during a first vaginal delivery: a case-control study

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OBJECTIVE: Determine whether dyssynergic defecation is a risk factor for third- or fourth-degree tear during a first vaginal delivery.

STUDY DESIGN: A retrospective case-control study was conducted on 549 primiparous women. The case group (n = 140) sustained an anal sphincter tear and the control group (n = 409) had a perineal laceration lower or equal to a second-degree tear. The Knowles-Eccersley-Scott Symptom questionnaire identified women who had dyssynergic defecation. A logistic regression analysis was performed.

RESULTS: Anal sphincter tear were 2.94 times higher for women reporting dyssynergic defecation ($P = .002$; 95% confidence interval [CI], 1.47-5.88). Odds ratios (ORs) were also significant for forceps ($P < .001$; OR, 6.90; 95% CI, 3.27-14.59), vacuum extraction ($P = .009$; OR, 2.36; 95% CI, 1.17-4.76), median episiotomy ($P = .009$; OR, 2.71; 95% CI, 1.54-4.78), and high infant weight ($P < .001$; OR, 2.25 for each 500 g increase; 95% CI, 1.69-2.99).

CONCLUSION: Dyssynergic defecation seems to increase anal sphincter tear, but prospective studies are needed to confirm the association.

Key words: dyssynergic defecation, Knowles-Eccersley-Scott Symptom questionnaire, third- and fourth-degree tear

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Since the early 1990s, research has shown that perinatal and postnatal clinical after effects of vaginal delivery were due to denervation injury and occult disruption and laceration of the perineum.[1] Perineal tearing affects up to 85% of primiparous women.[2] This rate includes all types of lacerations. The International Classification of Diseases identified 4 degrees of perineal tearing.[3] First-degree tears involve vaginal mucosa; second-degree tears involve the fascia, the muscles and the perineal body; third-degree tears correspond to a lesion of the external and internal anal sphincter; and fourth-degree tears are an extension of third-degree tears and involve the internal anal sphincter and the rectal and anal mucosa. Third- and fourth-degree tears are a clinically recognized complication of 0.5-5% of vaginal deliveries.[4] These tears are clinically underestimated because prospective studies that investigated perineal outcomes after a vaginal delivery with endoanal ultrasonography showed that between 13% and 20% of women had evidence of anal sphincter defect.[5-7] Another type of laceration is the sulcus tear, which is defined as a vaginal tear occuring in the upper half of the vagina in the absence of a third- or a fourth-degree tear.[3]

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Tears involving the anal sphincter complex during vaginal delivery are the main contributing factor, over the short term, to anal incontinence, including fecal and flatus incontinence.[1,8,9] In fact, 6 weeks postpartum, Sultan et al[7] reported that 13% of primiparas had symptoms of anal incontinence. A higher incidence was reported by Pinta et al[5] who found that in primiparous women who experienced third- or fourth-degree tears detected by endoanal ultrasound, 4 months after delivery, 50% of these had flatus incontinence and 17% had fecal incontinence. Over the long term, between 14 and 20 years after vaginal delivery, the literature shows that anal incontinence persisted in 15-40% of women who sustained a third- or fourth-degree tear. Long-term consequences may be explained by subsequent pregnancies and menopause.[10,11] Anal incontinence can severely diminish quality of life and lead to considerable personal and financial costs.[12] In the United States, it is estimated that the average total cost per patient for the treatment of anal incontinence is $17,166.[12]

Evidence suggests that forceps delivery and midline episiotomy are the main risk

factors for third- and fourth-degree tears.[4,13,14] Recently, Fatton[15] suggested that a lack of coordination of the pelvic floor muscles could be present during the second stage of labor and could be a risk factor for perineal tearing. This muscle dysfunction could cause anal sphincter tearing by increasing perineal tissue resistance. Only Preggazi et al[16] studied the effect in primiparous women of an inversion of command (women contract rather than relax their perineal muscles) on perineal trauma. Probably, because of the small sample size of this study as well as its methodologic flaws, no relationship was established with perineal trauma.

Furthermore, Fatton[15] suggested that a lack of coordination of the pelvic floor muscles, present in the second stage of labor, could be similar to that found during dyssynergic defecation. Dyssynergic defecation is defined as an inability to evacuate stools from the rectum. It is characterized by contraction rather than relaxation of the pelvic floor muscles and/or anal sphincters during a defecation attempt or by insufficient pelvic floor and/or anal sphincter relaxation or by insufficient and poorly directed abdominal pushing during a bowel movement. Thus, actual time spent pushing during a bowel movement or during the second stage of labor may be indicative of a lack of pelvic floor muscle coordination.[17] Because this lack of coordination has been shown to be a strong predictor of dyssynergic defecation,[17] it is reasonable to use the latter intermediary variable to identify the presence of a lack of pelvic floor muscle coordination.

In this context, the purpose of this study was to determine whether the presence of dyssynergic defecation during pregnancy was a risk factor for third- and fourth-degree tears during a first vaginal delivery.

Materials and Methods

This study was a retrospective case-control study. The project was approved by the institutional review boards for human research of 3 hospitals in the province of Quebec, Canada, participating in the research project: Centre Hospitalier Universitaire de Sherbrooke, Hôpital Charles LeMoyne, and Centre Hospitalier Universitaire de Sainte-Justine.

During a 16-month period from May 1, 2005, through Aug. 31, 2006, women 18 years or older who had delivered their first infant after at least 37 weeks of gestation were identified through birth registries kept on the hospitals' obstetrics floors. Women were excluded if they had had a cesarean section, multiple gestation, an abnormal fetus, or a stillborn infant. Perineal tears were identified by a review of the birth registries, in which the tears had been recorded by the physician who assisted with the delivery and classified according to the World Health Organization's international definition. Women with third- and fourth-degree tears, excluding sulcus tears, were defined as cases whereas controls were women with no perineal injury or first- or second-degree perineal tears.

Original data were collected from 2 sources as follows: first, a questionnaire was mailed to all eligible primiparous women and after receiving the completed questionnaire, a research assistant systematically reviewed the medical obstetric files to collect other risk factors and sociodemographic data. The mailing comprised the Knowles-Eccersley-Scott Symptoms (KESS) questionnaire,[18] evaluating the self-report of dyssynergic defecation during pregnancy and other questions about prenatal and perinatal care. A reminder letter was sent to women with a third- or fourth-degree tear 1 month after the first mailing if no answer had been received. Cases-control and controls were defined according to the severity of the perineal muscle tear.

The presence of dyssynergic defecation was evaluated using the KESS questionnaire.[18] The KESS is a structured symptom scoring system for diagnosing constipation and determining its severity. The KESS comprises 11 questions about internationally agreed criteria of the symptoms of constipation. Each question has 4 or 5 possible answers that are scored on an unweighted linear integer scale to produce a score between zero and 3 or zero and 4 points. The maximum score is 39 points and higher scores indicate greater constipation severity. With the use of a cutoff criterion of 10, the KESS questionnaire has 100% sensitivity and specificity for the diagnosis of constipation.[18] This questionnaire can also distinguish between types of constipation: slow-transit constipation, dyssynergic (or rectal evacuation disorder) or mixed (slow-transit constipation plus dyssynergic defecation) with a predictive equation.[18,19] Dyssynergic defecation is the type of constipation the KESS questionnaire predicts best, with a rate of 55% and 76% correctly classified according to 2 studies.[18,19] The KESS also includes 4 specific questions shown to be related to dyssynergic defecation: (1) hard stool, (2) digitation, (3) painful evacuation effort, and (4) feeling of incomplete rectal evacuation.[15] Moreover, it may be used prospectively or retrospectively.[20] In the current study, dyssynergic defecation was considered present when the KESS predictive equation suggested dyssynergic defecation and the woman presented at least 2 of the 4 specific symptoms of dyssynergic defecation lasting at least 50% of the defecation time during at least the second and the third trimester of pregnancy.

Risk factors for third- and fourth-degree tears identified in the literature were collected from the medical obstetric files: mother's age, gestational age, length of the second stage of labor, forceps delivery, vacuum extraction delivery, episiotomy, peridural analgesia, and newborn's weight. From the mailing these data were obtained: (1) physical activities: type and frequency; (2) performance of perineal massage during pregnancy: duration and frequency; (3) performance of pelvic floor muscle training during pregnancy, number of daily contractions and frequency of training; (4) weight gain $<$ 11.4 kg, between 11.5 kg and 16.0 kg, or more than 16.1 kg during pregnancy; and (5) semirecumbent, supine recumbent, lateral recumbent, sitting, squatting, 4-point kneeling, or upright position adopted during the pushing period.

Cases-control and controls were described by delivery method and other risk factors. The distribution of these variables was compared with the χ^2 test for categorical variables and Student *t*