55 - DOES THE ELECTIVE CESAREAN PROTECT THE WOMAN FROM THE OCCURRENCE OF URINARY INCONTINENCE AND FROM PELVIC FLOOR MUSCLE DYSFUNCTION?

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INTRODUCTION

Elective CS without labor is a common procedure in Brazil, and the average rate is more than 40%. In the past, it was thought to be protective against UI.[1]There are doubts whether elective CS confers an independent protective effect with regard to the risk of UI. Incontinence rates have not been correlated with delivery method, but elective CS without attempting labor has been associated with significantly lower prevalence of postpartum UI ($p = 0.01$).[2]

Whether cesarean section delivery may prevent pelvic floor injury is questionable,[3-5] but more recent data has suggested that this protective effect is less pronounced and that gestational UI appears the most important predictive factors for the development of postnatal UI.[6-8] The risk of UI was higher among women who had only had cesarean deliveries than among nulliparous women, and was even higher among those who had only delivered vaginally.[9]

In women without UI, the PFM contract simultaneously with, or precede, the increase in abdominal pressure as an unconscious involuntary automatic co-contraction.[10] To evaluate PFM function and strength, a variety of methods have been used in clinical practice and research but no single measurement tool gives a full picture of PFM strength or function with demonstrated responsiveness, reliability and validity, such that it would be capable of measuring the automatic action of the PFM in real-life situations.[11]

There is uncertainty regarding the relationship between obstetric events and pelvic floor injury, and whether women delivering by CS are at lower risk of subsequent UI than are women delivering vaginally.[12,13]

The aim of this cross-sectional study was to assess the two-year postpartum prevalence of UI and PFM dysfunction following elective CS among primiparas, and to determine the factors responsible for two-year postpartum UI and PFM dysfunction.

METHODS

Study population - The Institutional Review Board of Botucatu School of Medicine, São Paulo State University (UNESP), Brazil, granted approval for the study. All women who delivered between June 1, 2002, and February 28, 2003, were eligible for a postpartum interview regarding UI and persistent pelvic floor injury. Using data from the Health Department Registration System, 832 women were identified.

A simple telephone questionnaire was applied to recruit the eligible women: primiparous, with a maternal age at the time of delivery of between 20 and 30 years, delivery at term, (elective CS or spontaneous VC), and birth weight lower than 4 kg. The exclusion criteria were previous miscarriage, pelvic or abdominal surgery, previous urogynecological surgery, and chronic illnesses such as diabetes mellitus, hypertension, chronic rheumatoid disease or neurological disorders; 355women were recruited (40,2%).

Based on the pelvic floor strength with α of 0.05 and β of 0.2, the population needed for this study would be 106 with CS and 106 with VC. [14]

Investigation - Two-year postpartum, all the women were interviewed regarding UI symptoms and the prevalence of UI before, during and two-year after the “index birth”. All were questioned by the same author (AMPB). We took the definition for UI by Thomas et al (1980): “involuntary excretion or leakage of urine in inappropriate places or at inappropriate times twice or more a month, regardless of the quantity of urine lost”. Patients were also asked whether they had consulted a physician regarding their UI, and whether they desired further evaluation and treatment.[14]

Obstetric and maternal data relevant to the “index birth” were retrieved from the hospital records. The following maternal, fetal and obstetric parameters were included: maternal age, weight and height, weight gain during pregnancy, gestational age at delivery, delivery method (Cesarean section or vaginal delivery) and birth weight. The body mass index (BMI) (kg/m^2), i.e. the ratio of present weight in kilograms divided by height in meters squared (kg/m^2), was calculated.

A conventional clinical evaluation was then performed, and pelvic floor contraction was assessed by means of digital examination, which was performed with the knees semi-flexed. A score of between 0 and 3 was given, in accordance with Amaro (2000).[16] We considered that digital examination scores of less than 3 were abnormal. Vaginal manometry (perineometer) was performed with the woman in the same position as for the pelvic floor contraction assessment, using a vaginal latex sensor perineometer Manometric (Myofeedback Perina-Quark) values higher than 33.6 mmHg were considered normal.[14]

The data were analyzed using two different methods. Student's t test for comparing means and the Z test for investigating differences between proportions. Adjusted odds ratios (OR) and estimates of 95% confidence intervals (95% CI) were calculated using the Mantel-Haenszel χ^2 test. For logistic regression analysis, UI and PFM dysfunction were used as the reference variables. The statistical evaluations were performed using the SPSS 12.0 and SAS 8.02 software programs. The statistical significance level was set at $p < 0.05$.

RESULTS

The population characteristics showed no significant differences among the groups related to maternal age, gestational age at delivery, weight gain during pregnancy and birth weight. Two-year after delivery and the prevalence of UI was 17% following VC and 18,9% following CS. no significant differences were found in relation to either UI incidence or PFM dysfunction, in the elective CS and VC groups (Table 1)

Table 1 - Characteristics of the study population and prevalence of UI and pelvic floor strength dysfunction

	Vaginal Delivery n = 106		Cesarean Section n = 106		
Variables	**n (%)**	**y ± sd**	**n (%)**	**y ± sd**	**pvalue**
Age in years		25.04 ± 3.18		24.57 ± 3.17	0.291
Gestational age at delivery(w)		39.86 ± 1.31		39.68 ± 1.32	0.323
Weight gain in pregnancy (kg)		14.67 ± 3.94		14.59 ± 4.10	0.892
Birth weight (g)		3119.05 ± 421.17		3141.41 ± 464.64	0.714
PFM palpation abnormal	75 (70.8)		74 (69.8)		0.88
PFM perineometer-abnormal	61 (57.5)		60 (56.6)		0.89
Gestational UI	37 (34.9)		34 (32.1)		0.66
Two-year postpartum UI	18 (17.0)		20 (18.9)		0.72

sd = standard deviation

There was an increased risk of subsequent PFM dysfunction with increasing weight gain during pregnancy: OR 1.3; 95% CI: 1.1-1.4 for digital palpation, and OR 1.2; 95% CI: 1.0-1.3 for perineometer (Table 2)

Table 2 - Estimates obtained from the multivariate logistic model, analyzing the risk of PFM dysfunction two-year after vaginal delivery or cesarean section

	Digital palpation n = 212			Perineometer n = 212		
Variables	**OR**	**95% CI**	**p value**	**OR**	**95% CI**	**p value**
Age in years	0.98	0.889 - 1.081	0.6933	1.065	0.969 - 1.170	0.1923
Gestational age at delivery w	1.093	0.903 - 1.323	0.3591	1.133	0.946 - 1.358	0.0743
Weight gain in pregnancy(kg	1.301	1.153 - 1.468	<0.0001*	1.210	1.089 - 1.344	0.0004*
Birth weight (g)	1.000	0.999 - 1.001	0.8018	1.001	1.000 - 1.001	0.1300
BMI ? 25	0.941	0.859 - 1.031	0.1904	0.999	0.918 - 1.087	0.9800
Delivery vaginal or cesarean	1.025	0.541 - 1.945	0.1589	1.018	0.560 - 1.850	0.1524

The BMI = 25 and normal PFM strength two-year after delivery were less likely to complain of UI (OR 0.8; 95% CI: 0.7-0.9 and OR 0.1; 95% CI: 0.03-0.8, respectively). The women with gestational UI were more likely to describe UI symptoms two-year after delivery (OR 8.6; 95% CI: 3.0-24.3). The delivery method was not a risk factor for UI, two-year after the “index birth” (Table 3).

Table 3 - Estimates obtained from the multivariate logistic model, analyzing the risk of urinary incontinence two-year after vaginal delivery or cesarean section

	Urinary incontinence		
Variables	**OR**	**95% CI**	**p value**
Age in years	0.885	0.771 - 1.017	0.0851
Gestational age at delivery (w)	1.198	0.879 - 1.632	0.2519
Birth weight (g)	1.000	0.999 - 1.001	0.4034
BMI two years after delivery ? 25	0.874	0.775 - 0.985	0.0269*
Gestational UI	8.675	3.027 - 24.324	<0.0001*
Delivery method - vaginal or cesarean	0.675	0.282 - 1.617	0.3782
PFM - normal	0.184	0.038 - 0.895	0.0360*

DISCUSSION

The present study has shown that elective CS did not protect against UI two years after childbirth in Brazil, a country in which 40% of deliveries are by elective CS. Our results are in agreement with Viktrup et al (2002), who followed 278 primiparae five-year postpartum and found no statistically significant association between first birth by CS and UI at follow-up.[17]

Elective CS seems to have a limited protective effect that appears to weaken with time. Vaginal delivery in itself is neither sufficient as a precondition nor a necessary precondition for causing UI in most women and, by inference, CS is not sufficient to prevent all UI.[18,19] It has been assumed that CS delivery protects against UI, and several studies based on postpartum and general populations have found this association. McArthur et al (2006), in a longitudinal cohort investigation of UI in a postpartum population large enough to examine the effect of delivery method history, showed that delivery exclusively by CS gives rise to halving of the odds of developing persistent UI.[20] But even among this group, the prevalence of persistent UI was still relatively high, at 14%, i.e. quite similar to our results.

The analysis of first childbirth among 212 women showed that the risk of UI two-year postpartum following UI during pregnancy was raised considerably (OR 8.6; 95% CI: 3.02-24.32), and that childbirth-induced UI was not preventable by cesarean section. In Brazil, where CS is far more common than VC and may seem to offer a potential means for UI prevention, our results confirmed the data of Foldspang et al (2004) and Eason et al (2004), in which UI before delivery roughly doubles the likelihood of UI postpartum, regardless of whether delivery is vaginal or by CS,[7,21] and is an important risk factor for UI afterwards and later in life.[21,22] This protective data confirms that UI beginning during pregnancy is neither trivial nor transient: it indicates a significant risk of persistent UI, even in women delivered by CS. It also confirms retrospective studies, in finding that pregnancy-induced incontinence is one of the strongest predictors of postpartum incontinence, regardless of delivery route.

The present data, showing similar PFM dysfunction two-year after CS or VC, suggest that childbirth-induced UI is not preventable by elective cesarean section.[4] The identification of women at high risk of delivery-related pelvic floor trauma should be a priority for future research in this field.[18] Current evidence does not support the routine use of elective CS to prevent UI, and the delivery mode should continue to be dictated by obstetric considerations. This interpretation of our results is in agreement

with Casey et al (2005): "childbirth-induced pelvic floor injury does not appear to us to be easily preventable by modifying obstetric practice".[23] Even women with elective CS (our population) showed UI and PFM dysfunction at the same level as VC.

Higher weight gain during pregnancy was associated with increased risk of postpartum PFM dysfunction (OR 1.3; 95% CI: 1.1-1.4 and OR 1.2; 95% CI: 1.08-1.34), and BMI = 25 two-year after delivery was a protective factor against UI (OR 0.8; 95% CI: 0.77-0.98), agree with recent studies [24,25]

Eftekhar et al. (2006) found that UI prevalence was associated with high birth weight ($p = 0.00$; $\chi^2 = 25.5$).[2] Birth weight indicates the extra weight put on the lower abdominal organs during pregnancy, in addition to the size of the body that has to pass through the delivery canal. Our result does not confirm that birth weight has an influence on UI two-year after delivery probably because only considered birth weights lower than 4000 g was considered.

In conclusion, the prevalence of UI and PFM dysfunction was unrelated to delivery method, and elective CS did not constitute preventive factor against UI two-year after delivery. UI during pregnancy is a crucial precursor of UI two-year postpartum. The weight gain during pregnancy increased the risk of subsequent PFM dysfunction, while BMI = 25 kg/m^2 two-year after delivery was beneficial with regard to avoiding UI.

Further research on a larger group is needed in order to make definitive statements about the effects of delivery method on UI and pelvic floor dysfunction, two-year postpartum.

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DOES THE ELECTIVE CESAREAN PROTECT THE WOMAN FROM THE OCCURRENCE OF URINARY INCONTINENCE AND FROM PELVIC FLOOR MUSCLE DYSFUNCTION?

ABSTRACT

Background and purpose: To assess the two-year postpartum prevalence of urinary incontinence and pelvic floor muscle dysfunction and the factors responsible for them. Subjects: Cross-sectional study with 220 women with previous two-year elective cesarean section or vaginal childbirth. Methods: Urinary incontinence symptoms were asked, pelvic floor muscle

dysfunction was assessed by digital palpation and perineometer. Results: Two-year urinary incontinence prevalence following vaginal childbirth and cesarean section was 17% and 18.9%. Risk factor for pelvic floor muscle dysfunction was weight gain during pregnancy (digital palpation: OR: 0.874; 95% CI: 0.775-0.985 and perineometer: OR: 0.184; 95% CI: 0.038-0.895). Body mass index less than 25 kg/m2 and normal pelvic floor muscle were protective factors against urinary incontinence. Gestational urinary incontinence increased the risk for two-year postpartum urinary incontinence. Conclusion: Gestational urinary incontinence was a crucial precursor of postpartum urinary incontinence. Weight gain during pregnancy increased the risk of later pelvic floor muscle dysfunction, and elective cesarean section was not a preventable action for urinary incontinence.

KEY-WORDS: Pelvic Floor, Female Genital Diseases, Pregnancy Complications

LA CESARIENNE ELECTIVE PROTEGE-T-ELLE LA FEMME DE L'OCURRENCE DE L'INCONTINENCE URINAIRE ET DU FONCTIONNEMENT DEFECTUEUX DU MUSCLE PELVIEN ?

RESUME

But: Évaluer la grande quantité de l'incontinence urinaire et du fonctionnement défectuex du muscle pelvien deux années après la maternité et les facteurs responsables de cela. Sujets : Étude de coupe transversale avec 220 femmes deux années après la césarienne ou l'accouchement naturel. Méthodes: Les symptômes d'incontinence urinaire ont été obtenus par questionnaire, et le fonctionnement défectueux du muscle pelvien a été évalué par la palpation avec les doigts et par le perionemeter. Résultats: La grande quantité d'incontinence urinaire deux années après l'accouchement naturel a été en 17%, après la césarienne élective en 18.9%. Le facteur de risque pour le fonctionnent défectuex a été grossir pendant la gestation (palpation avec les doigts OR: 0.874; IC de 95%: 0.775-0.985 et par le periometer: OR: 0.184; IC de 95%: 0.038-0.895). L'indice de masse corporelle plus petite que 25 kg/m2 et fonction musculaire de la pélvis normale ont été des facteurs protecteurs pour l'incontinence urinaire. L'ocurrence d'incontinence urinaire pendant la gestation a augmenté le risque d'incontinence urinaire deux années après l'accouchement. Conclusion : L'incontinence urinaire de gestation a été le facteur précurseur crucial pour l'incontinence urinaire après l'accouchement. Le fait de grossir pendant la gestation a augmenté le risque du fonctionnement défectuex du muscle pelvien, et la césarienne élective n'a pas été facteur préventif pour l'ocurrence de l'incontinence urinaire.

MOTS-CLES: Muscle pelvien. l'incontinence urinaire. Césarienne élective

¿LA CESÁREA ELECTIVA PRO MUJER DEL OCURRENCE DE LA INCONTINENCIA URINARIA Y EL FUNCIONAMIENTO DEFECTUOSO DEL MÚSCULO PÉLVICO?

RESUMEN

Objetivo: Evaluar la gran cantidad de la incontinencia urinaria y el funcionamiento défectuex del músculo pélvico dos años después de la maternidad y los factores responsables de eso. Temas: Estudio de corte transversal con 220 mujeres dos años después de la cesárea o el parto natural. Métodos: Los síntomas de incontinencia urinaria fueron obtenidos por cuestionario, y el funcionamiento defectuoso del músculo pélvico fue evaluado por el palpamiento con los dedos y por del perionemeter. Resultados: La gran cantidad de incontinencia urinaria dos años después del parto natural han estado en 17%, después del cesáreo electiva en 18.9%. El factor de riesgo para lo funcionan défectuex fue agrandar durante la gestación (palpamiento con los dedos OR: 0.874; IC del 95%: 0.775-0.985 y por del periometer: OR: 0.184; IC del 95%: 0.038-0.895). el índice de masa corporal más pequeña que 25 kg/m2 y función muscular del pélvis normal fue factores protectores para la incontinencia urinaria. El ocurrence de incontinencia urinario durante la gestación ha aumentado el riesgo de incontinencia urinario dos años después del parto. Conclusión: La incontinencia urinaria de gestación fue el factor precursor crucial para la incontinencia urinaria después del parto. El hecho de agrandar durante la gestación aumentó el riesgo del funcionamiento défectuex del músculo pélvico, y la cesárea electiva no fue factor preventivo para el ocurrence de la incontinencia urinaria.

PALABRA-LLAVE: Músculo pélvico, Alboroto genital femenino, Complicación de la gestación

A CESÁREA ELETIVA PROTEGE A MULHER DE OCORRÊNCIA DA INCONTINÊNCIA URINÁRIA E DA DISFUNÇÃO MUSCULAR DO ASSOALHO PÉLVICO?

RESUMO

Objetivo: Avaliar a prevalência de incontinência urinária e da disfunção muscular do assoalho pélvico dois anos após o parto e os fatores responsáveis por elas. Sujeitos: Estudo de corte transversal com 220 mulheres dois anos após parto cesárea eletiva ou parto vaginal. Métodos: Os sintomas de incontinência urinária foram obtidos por questionário, e a disfunção muscular do assoalho pélvico foi avaliada pela palpação digital e pelo perineometro. Resultados: A prevalência de incontinência urinária dois anos após o parto vaginal foi em 17% após cesárea eletiva em 18.9%. O fator de risco para o disfunção muscular do assoalho pélvico foi o ganho do peso durante a gravidez (palpação digital: OR: 0.874; IC de 95%: 0.775-0.985 e pelo perineômetro: OR: 0.184; IC de 95%: 0.038-0.895). O índice de massa corpórea menor que 25 kg/m2 e função muscular do assoalho pélvico normal foram fatores protetores para incontinência urinária. A ocorrência de incontinência urinária durante gestação aumentou o risco para incontinência urinária dois anos após o parto. Conclusão: A incontinência urinária gestacional foi fator precursor crucial para incontinência urinária após o parto. O ganho do peso durante a gravidez aumentou o risco de disfunção muscular do assoalho, e o parto cesárea eletivo não foi fator preventivo para a ocorrência de incontinência urinária.

PALAVRAS-CHAVE: Assoalho Pélvico, Desordem Genital Feminina, Complicação da Gestação.