

## STRESS INCONTINENCE AND CHILDBIRTH: RESULTS OF A 5 YEAR LONGITUDINAL STUDY

### Hypothesis / aims of study

Epidemiological studies show an increased risk of SUI among women who have had vaginal delivery (VD) compared to caesarean section (CS) (1). Although the short-term occurrence of SUI is reduced after CS (2), prospective long-term data is available only for VD (2). Increased antenatal BNM has been identified as one of the predictive factors for SUI (3). Currently there is no long-term data evaluating the effect of delivery mode on BNM, SUI symptoms and its impact on quality of life (QoL) using validated tools.

Our aim was to prospectively evaluate the impact of mode of delivery on bladder neck mobility (BNM), stress urinary incontinence (SUI) symptoms and their influence on QoL in primiparous women over a 5 year period using validated measures.

### Study design, materials and methods

Between April 2005 and July 2006 nulliparous women (over 18 years of age) with a singleton pregnancy had perineal ultrasound examinations (B&K Medical, 6 MHz curvilinear probe) in the supine position with a comfortably full bladder at 20 weeks (Visit 1), 14 weeks postpartum (Visit 2), 1 year postpartum (Visit 3) and 5 years postpartum (Visit 4). BNM from the resting (R) position to maximum Valsalva (V) was calculated using the following formula: distance R to V =  $\sqrt{\{(Vx - Rx)^2 + (Ry - Vy)^2\}}$  (3). For the subjective assessment of SUI symptoms and their impact, the paper version of the validated electronic Personal Assessment Questionnaire (ePAQ -PF) was completed at each visit. This study was performed prior to the readily available electronic version.

### Results

Of the 182 nulliparous women recruited. All women completed the questionnaire and 152 (84 %) had a perineal scan at Visit 1. 129 (71%) attended Visit 2, 78 (43%) Visit 3 and 97 (53%) Visit 4. Questionnaires and BNM measurements were performed in 126 (69.2%)/ 118 (64.8%), 90(49.5%)/76(41.8%), 94 (51.7%)/97 (53.3%) respectively. The demographic and obstetric variables are shown in Table 1. The women delivered between Visit 3 and 4 were excluded from 5-year analysis [still primiparous at Visit 4 VD (n=32) and CS group (n=14)].

Compared to Visit 1, in the VD and CS group, SUI symptoms, bother and QoL scores did not significantly worsen at any visit. Longitudinal changes in SUI symptom scores and BNM depending on mode of delivery are shown in Table 2.

### Interpretation of results

While previous studies have focused on the prevalence of SUI after childbirth (1) this is the first longitudinal study of primiparous women analysing the change in symptoms, it's bothersomeness and QoL. We have shown that there is no change in SUI scores and QoL after both VD and CS at 14 weeks, 12 months and 5 years compared to the antenatal period. This information is important in counselling women regarding the mode of delivery. Although there was a significant increase in BNM following both VD and CS, 5 years after delivery, there was no comparable increase in SUI. These findings suggest that factors other than BNM, such as urethral mobility and urethral closure pressures may play a more important role in the pathogenesis of SUI. Therefore, longitudinal studies exploring these factors need to be performed during pregnancy and after childbirth.

### Concluding message

Primiparous women can be reassured that there is no significant change in bothersome symptoms of SUI and the QoL up to 5 years after childbirth irrespective of the mode of delivery.

**Table 1. Characteristics of primiparous women (n=182)**

Age years (range)	29.7 (17-45)
BMI (range)	26.6 (18-41)
% Caucasians	105 (58%)
% Epidural	20 (33/166)
% VD	72 (128/177)
% CS	28 (49/177)
% Episiotomy	25 (43/175)
% 3 <sup>rd</sup> -4 <sup>th</sup> degree tear	5.7 (10/175)
Birth weight g (range) n=173	3219 (400-4560)
Median head circumference mm (range)	340 (180-380)

**Table 2. Longitudinal comparison of stress incontinence scores and bladder neck mobility (BNM) in primiparous women following VD and CS**

	VD (n=128)	CS (n = 49)

Stress incontinence average score (range)	0 (0- 46.7)	0 (0- 25.0)
Change average score at 14 weeks from baseline	0.50	-0.22
Number of matched pairs	94	31
p-value	0.99	0.77
Stress incontinence average score (range)	6.7 (0- 40.0)	0.0 (0- 20.0)
Change average score at 1 year from baseline	2.65	35
Number of matched pairs	68	19
p-value	0.05	0.98
Stress incontinence scores	0 (0- 80.0)	0 (0- 53.4)
Change average score at 5 years from baseline	0.72	2.78
Number of matched pairs	28	12
p-value	0.57	0.49
Mean (SD) BNM at 14 weeks in cm	1.19 (0.6)	0.9 (0.4)
Change in mean BNM at 14 weeks from baseline	0.23	0.02
Number matched pairs	80	27
p-value	0.00005	0.88
Mean (SD) BNM at 1 year in cm	1.21 (0.4)	0.98 (0.5)
Change in mean BNM at 1year from baseline	0.27	0.16
Number matched pairs	51	11
p-value	0.002	0.16
Mean (SD) BNM at 5 year in cm	2.1 (1.7)	2.3 (1.5)
Change in mean BNM at 5 years from baseline	1.14	1.33
Number matched pairs	26	11
p-value	0.0006	0.004

#### References

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3. King JK, Freeman RM. Is antenatal bladder neck mobility a risk factor for postpartum stress incontinence? BJOG 1998;105(12):1300-7

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<b>Is this a clinical trial?</b>	<b>No</b>
<b>What were the subjects in the study?</b>	<b>HUMAN</b>
<b>Was this study approved by an ethics committee?</b>	<b>Yes</b>
<b>Specify Name of Ethics Committee</b>	<b>National Research Ethics Service South West London REC 4</b>
<b>Was the Declaration of Helsinki followed?</b>	<b>Yes</b>
<b>Was informed consent obtained from the patients?</b>	<b>Yes</b>