

## AN EPIDEMIOLOGICAL STUDY TO ASSESS PREVALENCE AND RISK FACTORS FOR PELVIC FLOOR DYSFUNCTION IN PRIMIGRAVIDAE DELIVERED 20 YEARS EARLIER.

### Aims of study

1. To determine the prevalence of symptoms of prolapse and urinary or anal incontinence in a cohort of primigravidae delivered 20 years earlier.
2. To use the 'Standard Maternity Information System' (SMIS), a regional maternity database, operational between 1983-1993, to assess the impact of obstetric events at first delivery, and the influence of subsequent pregnancies and other variables, on current pelvic floor dysfunction.

### Study design, materials and methods

Index cases, defined as primigravidae delivered between 1983 and 1986, were identified from birth registers, and matched against maternity case records on the SMIS database. Tracing of index cases was performed using the NHS Strategic Tracing Service. Women whose current address could not be determined, those known to be deceased, or having suffered stillbirth were excluded. Those living out of region, where ethical approval was not effective, were also not contacted. A letter of invitation and screening questionnaire were posted to index cases. Women were asked to report any symptoms of prolapse, urinary or anal incontinence, and their degree of associated bother. Enquiry was also made into pelvic floor surgery, current parity, chronic cough, weight and height. Those failing to respond within 3 months were sent a second screening questionnaire. Regardless of their responses to this, women were invited to complete further, more detailed questionnaires (SF-12 v 2™ and Sheffield-PAQ v 3.0 ©).<sup>1</sup> Women were also asked to invite their mothers to participate in the studies, in order to examine familial aspects of pelvic floor dysfunction; these data may form part of a subsequent presentation. Data from questionnaires were entered manually onto a *Microsoft Access* database. Sample size: Based on 50% prevalence of 'any leakage of urine', and para 1 making up 15% of the cohort at follow-up, an 80% power to detect 10% difference in risk factors would require a sample size of 1500; allowing for a response rate of 50% we sought an initial cohort of 3000 women. Statistical Analyses: Respondents were compared to non-respondents with respect to age, social class, and obstetric variables at first delivery (Chi-square and Wilcoxon rank-sum test). Associations between pelvic floor symptoms and obstetric events at the first delivery were examined in women with parity=1 and in the total cohort using Fisher's Exact Test, Chi-square and Chi-square test for trend. Multivariate analysis was performed using adjusted Odds Ratios and logistic regression.

### Results

4421 primigravidae who delivered between January 1983 and September 1986 were identified; 3046 apparently fulfilled inclusion criteria; 47 of these were subsequently excluded for a variety of reasons. 62% (1861/2999) returned a screening questionnaire, of which 1831 were complete; 359 were from women who only ever had 1 pregnancy. No clinically significant differences were identified between respondents and non-respondents. 54% (985/1831) of women reported symptoms in at least one aspect of pelvic floor dysfunction, with 16.7% (306/1831) reporting in 2 aspects and 3.3% (60/1831) in all three aspects. 43.2% (41.0-45.5, 95%CI) of women reported urinary incontinence with 31.6% (29.5-33.8, 95%CI) describing this as being at least 'a bit of a problem'; 13.5% (12.0-15.1, 95%CI) reported prolapse with 7.1% (6.0-8.4, 95%CI) reporting this as at least 'a bit of a problem'; 20.5 (18.7-22.4,95%CI) reported anal incontinence with 15.6% (14.1-17.4, 95%CI) saying this was at least 'a bit of a problem'.

Women who had undergone continence or prolapse surgery were classified as having urinary incontinence and prolapse respectively when analysing risk factors (even if they denied current symptoms). Risk factors identified as significant are shown in the table. Non-significant factors included current age, social class, age at first delivery, and each of the following in relation to first delivery: gestation, onset of labour, length of 1<sup>st</sup> and 2<sup>nd</sup> stage, birth weight, perineal injury and epidural analgesia.

Factors	Urinary incontinence		Prolapse		Anal incontinence	
	Para=1	Total Cohort	Para=1	Total Cohort	Para=1	Total Cohort
BMI <25	1.0	1.0	1.0	1.0	1.0	1.0
25-30	2.3 (1.3-3.9)	1.7 (1.4-2.1)	1.15 (0.5-2.9)	1.0 (0.7-1.4)	1.0 (0.5-2.0)	1.4 (1.1-1.8)
>30	2.9 (1.6-5.4)	2.3 (1.8-3.1)	2.87 (1.3-6.6)	1.3 (0.9-1.9)	1.5 (0.7-3.0)	1.6 (1.1-2.2)
Normal	1.0	1.0	1.0	1.0	1.0	1.0
Assisted	0.9 (0.5-1.8)	0.8 (0.6-1.1)	1.2 (0.5-3.2)	0.8 (0.6-1.1)	1.6 (0.7-3.4)	1.4 (1.0-1.9)
CS	0.3 (0.1-0.7)	0.5 (0.3-0.7)	0.5 (0.1-2.0)	0.4 (0.2-0.7)	0.5 (0.2-1.5)	0.9 (0.5-1.5)
Parity 1		1.0		1.0		1.0
2		1.2 (0.9-1.6)		1.3 (0.9-1.9)		1.2 (0.9-1.7)
≥3		1.3 (0.9-1.7)		1.6 (1.0-2.4)		1.1 (0.7-1.5)

Table: Risk factors for pelvic floor symptoms (adjusted odds ratios (95% CI))

### Interpretation of results

These results suggest that BMI is an important risk factor for prolapse, urinary and anal incontinence. Vaginal delivery was the only obstetric risk factor identified. In women of parity=1 delivered by caesarean section there was a 70% reduction in urinary incontinence. In women of parity>1 a first caesarean section appears to be protective regardless of further pregnancies. Women of parity>1 also had a reduced risk of prolapse after a first delivery by caesarean section. Parity >2 appeared to be more of a risk factor for prolapse than urinary incontinence. To avoid recall bias, we did not ask women to define the onset of their symptoms; they are in any case a relatively young group; this limits interpretation of the effect of age itself as a risk factor.

### Concluding message

The prevalence of urinary incontinence is more than twice that of anal incontinence and four times that of prolapse 20 years after first delivery; the majority of women reporting symptoms found them bothersome. There may be a larger contributory effect from vaginal delivery in first pregnancy and/or current BMI on urinary incontinence than on prolapse, whereas higher order parity may confer an additional independent risk factor for prolapse.

### References

1. Brit J Obstet Gynaecol 2006;113:231-238

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**HUMAN SUBJECTS:** This study was approved by the Newcastle and North Tyneside LREC and followed the Declaration of Helsinki Informed consent was obtained from the patients.