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Trutnovsky G[1], Kamisan Atan I[2], Martin A[2], Dietz H P[2]
1. *Medical University of Graz, Austria,* ***2.*** *Sydney Medical School Nepean, Australia*

VAGINAL BIRTH AND PROLAPSE – DOES THE EFFECT VARY DEPENDING ON THE COMPARTMENT?

Hypothesis / aims of study

Mode of delivery has been shown to influence the development of pelvic organ prolapse (POP) in epidemiological studies (1). The aim of our study was to analyse the associations between delivery mode and symptoms and signs of POP in a cohort of symptomatic women, distinguishing between different forms of prolapse as identified on clinical examination and translabial ultrasound imaging.

Study design, materials and methods

In this retrospective study the records and imaging datasets of patients attending a tertiary urogynaecological unit for investigation of pelvic floor disorders between January 2012 and December 2014 were analysed. The initial assessment comprised an interview covering obstetric history and symptoms of prolapse including visual analogue scale (VAS) scores of symptom bother, ICS POP-Q and 4D transperineal ultrasound (US). For the purpose of this analysis women were then grouped into four different delivery mode categories, according to the most traumatic delivery reported. The groups were defined as follows: “Forceps delivery (FD) group”: at least one forceps delivery or failed trial of forceps; “Normal vaginal delivery (NVD) and Vacuum assisted delivery (VD) group”; “Caesarean Section (CS) group”; and the “Nulliparous (NP) group”. Vacuum was grouped with NVD due to a lack of evidence for increased pelvic floor trauma rates compared to NVD, and due to the low number of patients with Vacuum compared to Forceps.

Significant prolapse on clinical examination was defined as a POP-Q stage of >=2 for the anterior and posterior compartment, and POP-Q stage >=1 for the central compartment (2). Offline analysis of US volume data for pelvic organ prolapse was undertaken at a later date, blinded to clinical data. POP was assessed on US volumes obtained on maximal valsalva. Significant prolapse was defined as bladder descent to 10 mm or more below the symphysis pubis (SP), uterine descent to 15 mm or less above the SP, and/or descent of the rectal ampulla to 15 mm ore more below the SP (3).

Results

Of 1333 patients seen during the study period, 75 were excluded: 73 due to missing US volumes and 2 due to missing information on delivery mode, leaving 1258 for analysis. Mean age was 56 (17 – 89) years and the mean BMI was 29(15.1 -54.7) kg/m^2. 53% (n=662) complained of prolapse symptoms, with a mean bother of 5.7 (SD 3.6) and 18% (n=227) had had previous POP surgery. 389 women (31%) had a previous hysterectomy, leaving 849 women for the assessment of uterine prolapse.

Median parity was 2 (0-9), and 90.3 % were vaginally parous. 317 women (25.2%) had had at least one FD or a failed trial of forceps. 822 women (65.3%) had had NVD or VD only. 54 women (4.3%) had had CS deliveries only, and 65 (5.2%) were nulliparous, comprising a reference group.

On clinical examination, 76.6% (n= 963) had significant POP: 55.9% (n= 702) cystocele >= stage 2, 43.4% (n= 377/869) uterine descent >=stage 1, and 53.4% (n=672) a rectocele >= stage 2. On ultrasound imaging, 65.7% (n=827) had sonographically significant POP: in 41.1% (n=517) this affected the bladder, in 46.1 % (n=401/869) the uterus, and in 39.9% (n= 502) the rectal ampulla.

Among delivery groups, there was an increasing likelihood of symptoms and signs of POP, from the NP group to the CS group, the NVD/ VD group and further to the FD group, with the most pronounced rise between vaginally nulliparous and vaginally parous women. After adjustment for age, menopause, BMI, parity, previous POP surgery, and hysterectomy these differences between delivery groups remained highly significant (Table 1). A comparison of NVD/ VD and FD groups showed no significant differences between those groups, except for symptoms of prolapse, VAS score for prolapse bother and rectocele on POP-Q.

	NP N=65	**CS N=54**	**NVD +VD N=822**	**FD N=317**	**p for trend**
Symptoms of prolapse	23.1%	29.6% 1.2 (0.50-2.90)	53.5 % 2.9 (1.48-5.82)	60.3% 3.8 (1.89-7.70)	<0.001
Bother of POP (VAS > 3)	13.8%	22.2% 1.3 (0.49- 3.60)	41.6% 3.0 (1.38- 6.62)	48.9% 4.1 (1.84- 9.07)	<0.001
Cystocele on POPQ	16.9%	24.1% 1.2 (0.46- 3.15)	59.6% 5.7 (2.65- 12.15)	59.6% 6.1 (2.82- 13.35)	<0.001
Uterine prolapse* on POPQ	11.1%	6.4% 0.4 (0.07- 2.00)	46.5% 5.9 (2.17- 16.18)	50.2% 7.3 (2.62- 20.14)	<0.001
Rectocele on POPQ	20.0%	24.1% 0.7 (0.27- 1.80)	54.6% 2.3 (1.13- 4.81)	62.2% 3.4 (1.61- 7.09)	<0.001
Any sign. prolapse on POPQ	33.8%	37.0% 0.6 (0.28- 1.51)	80.6% 3.9 (1.98- 7.80)	81.7% 4.5 (2.21- 9.20)	<0.001
Cystocele on US	7.7%	13.0% 1.0 (0.28- 3.51)	44.0% 5.1 (1.94- 13.61)	45.1% 5.87 (2.19- 15.72)	<0.001
Uterine prolapse* on US	9.3%	8.5% 0.9 (0.29- 2.51)	48.8% 3.3 (1.45- 7.47)	51.5% 3.9 (1.68- 8.95)	<0.001

Post. Comp. descent on US	12.3%	25.9% 1.6 (0.58- 4.38)	42.0% 3.3 (1.44- 7.44)	42.6% 3.5 (1.52- 8.06)	0.003
Any POP on US	32.3%	37.0% 0.7 (0.31- 1.62)	68.4% 2.7 (1.40- 5.10)	70.7% 3.3 (1.68- 6.44)	<0.001

Table 1: Symptoms and signs of POP by delivery mode (n=1258). Data are presented as percent and adjusted Odds ratio (95% confidence interval), controlled for age, BMI, menopause, parity, previous POP surgery and previous hysterectomy; * excluding women with previous hysterectomy

Interpretation of results

In this large retrospective analysis women´s obstetric history was strongly associated with the presence of symptoms and signs of POP. Vaginally parous women were more than twice as likely to report symptoms and bother of POP, compared to vaginally nulliparous women, with a history of forceps further increasing the odds. Significant prolapse on clinical POP-Q examination or ultrasound was 3 to 6 times more common in women who delivered vaginally, compared to women who delivered by CS only. This was true for all compartments. The additional risk imposed by the use of forceps is likely to be underrepresented in this symptomatic population due to selection bias.

Concluding message

There is a strong association between vaginal birth and symptoms and signs of prolapse, and this seems to be true for all three vaginal compartments.

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