



RESEARCH

INFORMATION

Long-term pelvic floor dysfunction after childbirth: the ProLong20+ study

ProLong20+

Longitudinal study of pelvic floor dysfunction, and its relationship with childbirth



AIMS

Pelvic floor problems such as urinary incontinence (UI), faecal incontinence (FI) and pelvic organ prolapse often follow childbirth. For example, 10% of adult women will experience weekly UI, equating to 220K women in Scotland. However, women may only experience such symptoms later in life. We do not fully understand when these symptoms might occur and what role childbirth has played.

This is a study of a group of women (a cohort) who had UI after having a baby in 3 centres in 1993 or 1994 (we call this their index birth). We followed them up with questionnaires over time to address the following research questions:

- What is the progression of female pelvic floor dysfunction (PFD) (UI, FI, prolapse) over the life-course, from childbirth through to menopause and beyond?
- What are the associations between childbirth, and other risk factors, and pelvic floor anatomy and symptoms; and
- Are these associations affected by menopausal status?

It aimed to:

- Undertake long-term questionnaire follow-up and record linkage in an existing international cohort of women at least 20 years post-delivery; and prolapse examination and pelvic floor ultrasound assessment in a sub-group.
- Maintain a cohort whose pelvic floor health can be researched in the longer term.



KEY FINDINGS

- The response rate for the questionnaire follow-up was 37%: 39% in Aberdeen, 33% in Birmingham, 44% in Dunedin, New Zealand (NZ).
- 61% of women in the cohort who had given birth in 1993/94 reported having some level of UI, 22% reported FI and 17% reported prolapse symptoms 20/26 years after the index birth.
- There was a higher prevalence of PFD reported by respondents compared to previous time-points.
- Risk factors associated with PFD at this long-term follow-up were mode of delivery history, age at first baby and body mass index (BMI).



WHAT DID THE STUDY INVOLVE?

- Previously we investigated the effect of childbirth on PFD in a cohort of 7,883 women in NZ (n=938), Aberdeen (n=3,142) and Birmingham (n=3,803) 3 months after an 'index' birth occurring in 1993-1994.
- We then followed up women at 6 and 12 years after the birth. NZ participants completed a further questionnaire at 20 years (2013/14) and were offered a pelvic floor ultrasound and examination.
- Similar to the NZ 20-year follow-up, UK participants received a questionnaire and offer of examination at 26 years after the index birth. The 20 and 26 year data have been combined here for an analysis of long-term PFD in this cohort.
- A member of the public was a co-investigator and member of the study research team, bringing the women's perspective to the study through her involvement throughout in the development and delivery of the project.



WHAT WERE THE RESULTS AND WHAT DO THEY MEAN?

- 6,195 invitations were sent out to those women who had not withdrawn, been lost to follow-up or died and 2,270 questionnaires returned (37%).
- Baseline characteristics of respondents were different from other women in the cohort: they were slightly older (median 1.5 years older) at index birth and more likely to have reported UI at that time (35% vs 33%). They were more likely to have had a perineal tear or episiotomy (a cut to the perineum) when giving birth (73% vs 66%), and more likely to have had a second stage of labour lasting longer than an hour (34% vs 30%). Differences were small but statistically significant.
- The average age of the participants when responding was 56 years, ranging from 36 to 56 years for NZ respondents, and 41 to 73 years for UK respondents.
- Age at first birth ranged from 15 to 44 years, with median 28 years.
- Average number of births was 2, ranging from 1 to 14.
- 39% of respondents were from Aberdeen, 43% from Birmingham and 18% from Dunedin.
- Overall 60.7% of women reported at least some level of UI in the previous 4 weeks, 21.6% reported FI and 17.2% reported a “feeling of something of coming down” (SCD), the main symptom of prolapse. Prevalence of UI and FI was higher than at previous time-points (Table 1).
- Respondents were less likely to report UI if they had only ever delivered their babies by caesarean section (CS) (Table 2). A current BMI of ≥ 25 also increased the likelihood of UI.

Table 1. Prevalence of PFD symptoms over time

SELF-REPORTED SYMPTOMS	Baseline	6 years	12 years	20/26 years
UI*	33.1%	45.2%	52.7%	60.7%
FI*	9.6%	10.1%	13.0%	21.6%
SCD*			17.0%	17.2%

* Any positive response UI Urinary incontinence FI Faecal incontinence SCD “Something coming down”
 Not all 2270 respondents at 20/26 years answered all question

- A BMI of ≥ 35 increased the likelihood of both FI and prolapse symptoms. Having ≥ 3 babies increased the likelihood of FI, as did any baby being delivered by forceps (Table 2).
- Women aged 25 and over at first birth were less likely to report symptoms of prolapse compared to those who were under 20, as were those who had only ever delivered babies by CS (Table 2).

Table 2. Prevalence of PFD Symptoms by Delivery Mode History

	Only SVD	Only CS	Any forceps	Any vacuum (no forceps)	SVD + CS	Total
Any UI	59.7%	51.9%	62.7%	69.4%	59.9%	60.7%
Any FI	20.1%	17.7%	26.8%	23.3%	19.5%	21.7%
SCD	17.6%	9.4%	19.4%	19.0%	14.3%	17.2%

UI = Urinary Incontinence (UI); SVD = Spontaneous vaginal delivery; CS = Caesarean section; SCD = something coming down

The questionnaire recorded details of up to 6 births. For respondents reporting more than 6 births (n=13) the delivery method was assumed to be SVD.

Not all 2270 respondents at 20/26 years answered all question

- Many of the women in the cohort are now menopausal. While this information was not collected for the 20 year follow-up in NZ, 80% of the UK respondents at 26 years provided sufficient data to estimate menopausal status: 30% pre-menopausal, 70% post-menopausal.
- There was no difference in the rate of FI reported for pre- compared to post-menopausal respondents (FI: 20% vs 21%), but there was a significantly higher prevalence of UI and SCD in the former (UI: 66% vs 58%; SCD: 20% vs 14%).
- The study was severely impacted by the Covid pandemic. The questionnaire response rate was lower than anticipated. The planned examination and ultrasound assessment component of the study, to take place in 500 women from the cohort, was halted which meant we are not able to report on the anatomy of the pelvic floor. However, women's self-reported symptoms from the questionnaires are the more important outcomes. Linkage of our questionnaire data to medical records was also impacted, restricting linkage to the Scottish cohort members only. Forthcoming analysis of the linked routine hospital data will give further information about how representative the findings are.
- In summary, UI and FI were more prevalent in the cohort at 20/26 years after the index birth than previously reported, and the women's delivery mode history remained a significant factor influencing the reporting of PFD: delivery exclusively by CS gave some protection against UI and prolapse, whilst delivery by forceps increased the prevalence of FI. Post-menopausal women appeared to have less UI and prolapse symptoms, also reported in other studies but not yet understood. A high current BMI substantially increased the risk of UI, FI and prolapse symptoms.



WHAT IMPACT COULD THE FINDINGS HAVE?

- Findings provide further evidence about the impact of childbirth and mode of delivery on women's pelvic health in later years.
- Results will help women and healthcare professionals make informed decisions during pregnancy and childbirth.
- Women can also use the findings to understand how other modifiable lifestyle factors, such as being overweight, impact on their pelvic floor health, potentially supporting helpful behaviour changes. Women may also be encouraged to take preventative measures such as practising pelvic floor muscle exercises which is known to be of benefit.
- Prevalence data will inform estimates of future need for PFD treatment, and help prioritise research in this area, ultimately improving women's health during and after pregnancy.
- Data are intended to be used to further develop a risk prediction model for use in practice to help prevent PFD.



HOW WILL THE OUTCOMES BE DISSEMINATED?

- The research findings have been presented at the International Continence Society 2021 meeting and won Best Clinical Abstract (<https://www.ics.org/2021/abstract/19>).
- Results were also presented at The Royal Society (<https://royalsociety.org/science-events-and-lectures/2021/10/womenshealth/>).
- Results will be submitted to BJOG: An International Journal of Obstetrics and Gynaecology.
- Further follow-up of the cohort at 35 years will be explored.
- A study results summary will be sent to participants who requested it. Our Patient & Public Involvement partners at NMAHP Research Unit will advise on further dissemination routes.



CONCLUSION

This unique longitudinal follow-up of women after childbirth has shown continued increases in the prevalence of symptoms of pelvic floor dysfunction up to 26 years following index birth. Differences were observed according to delivery mode history. While there is an indication that a delivery history of exclusive caesarean sections may be associated with a reduced risk of UI and prolapse, the prevalence of PFD generally remains high with 61%, 22% and 17% of women reporting UI, FI and prolapse symptoms respectively. Awareness of this can help women and healthcare professionals focus on preventative measures that can reduce pelvic health problems in the future.



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Additional Information

Project completed: 31 November 2022

Funding awarded: £228,617