

WATER BIRTH AND OBSTETRIC ANAL SPHINCTER INJURY IN NON-INSTRUMENTAL BIRTHS: A RETROSPECTIVE COHORT STUDY IN A DIVERSE METROPOLITAN MELBOURNE POPULATION

Arinajeet Bhullar¹, Bronwen Eldridge¹

¹Eastern Health, Department of Obstetrics and Gynaecology

BACKGROUND

- Obstetric anal sphincter injury (OASI: 3rd or 4th degree tear) is a serious complication of vaginal birth and is associated with long-term morbidity
- Waterbirth is increasingly utilized in Australia; however, evidence regarding its association with waterbirth remain conflicting.
- Women of Asian ethnicity have been shown to be at higher risk of OASI.
- Limited Australian data exist examining the relationship between water birth and OASI in culturally diverse populations.

AIM

To determine whether water birth is associated with OASI and to assess the influence of country of birth (as proxy to ethnicity) and parity on OASI risk among women undergoing non-instrumental vaginal birth

METHODS

Design: Retrospective cohort study

Setting: Eastern Health, VIC, maternity sites of Box Hill Hospital and Angliss Hospital

Data Source: Hospital perinatal database

Study Period: 1 January 2023 – 31 December 2025

Population: All women who had a singleton, cephalic, non-instrumental vaginal birth at Eastern Health

Inclusion Criteria: singleton, cephalic, non-instrumental vaginal births

Exclusion criteria:

- Instrumental vaginal births (Forceps or Vacuum)
- Caesarean births
- Multiple pregnancies
- Non-cephalic presentations

Exposure: Water birth (birth of the baby while the mother is immersed in water) vs non-water (land) birth.

Outcome: OASI (3rd or 4th degree perineal tear)

Covariates: Parity, birthweight, country of birth (self reported; used as proxy for ethnicity) .

Statistical Analyses: Descriptive statistics, chi-square tests for categorical variables. Multivariable logistic regression was used to estimate adjusted odds ratio (aOR) with 95% confidence intervals (CI). A two-sided p value <0.05 was considered statistically significant.

ETHICS

- Findings may assist clinicians in counselling women considering water birth.
- Awareness of increased OASI risk in women born in Asian countries is important
- Further research with self reported ethnicity and additional confounders is needed

STUDY COHORT (1 JANUARY 2023 – 31 DECEMBER 2025)



6,719

Total non-instrumental vaginal births



318 (4.7%)

Water births



107 (1.6%)

Women with OASI (3rd or 4th degree tear)



2 Sites

Box Hill Hospital & Angliss Hospital

OASI INCIDENCE: WATER BIRTH VS NON-WATER BIRTH

Birth Type	OASI (n)	Total (n)	OASI Rate (%)
Water birth	10	318	3.1%
Non-water birth (land)	97	6,401	1.5%
Total	107	6,719	1.6%

CRUDE ASSOCIATION

Water birth vs Non-water birth

OR 2.11

(95% CI 1.09 – 4.09)

p = 0.035

MULTIVARIABLE LOGISTIC REGRESSION ANALYSIS

Adjusted for parity, birthweight, and country of birth (Asian vs non-Asian)

Variable	Adjusted OR	95% CI	p-value
Water birth (Yes vs No)	2.49	1.27 – 4.91	0.008
Asian country of birth (Yes vs No)	1.93	1.25 – 2.98	0.003
Birthweight (per 100 g increase)	1.06	1.02 – 1.11	0.001
Multiparous (Yes vs Nulliparous)	0.64	0.43 – 0.95	0.029



Water birth independently associated with 2.5 times higher odds of OASI.



Women born in Asian countries had ~2 times higher odds of OASI.



Multiparity was protective against OASI.

KEY MATERNAL AND BIRTH CHARACTERISTICS

Characteristic	Water Birth (n = 318)	Non-water Birth (n = 6,401)	p-value
Nulliparous, n (%)	101 (31.8)	2,956 (46.2)	<0.001
Multiparous, n (%)	217 (68.2)	3,445 (53.8)	<0.001
Birthweight, mean ± SD (g)	3,573 ± 426	3,336 ± 603	<0.001
Gestation (weeks), mean ± SD	39.9 ± 1.3	38.9 ± 1.6	<0.001
BMI (kg/m ²), mean ± SD	23.7 ± 5.0	25.8 ± 6.3	<0.001
Asian country of birth*, n (%)	15 (4.7)	1,419 (22.2)	<0.001

*Asian country of birth was used as a proxy for ethnicity due to the unavailability of self-reported ethnicity data. This approach has limitations and may result in misclassification.

LIMITATIONS

- Retrospective design using routinely collected data.
- Country of birth used as a proxy for ethnicity; does not reflect individual ethnic background and has limitations.
- Potential for residual confounding from unmeasured variables (e.g. maternal age, duration of second stage, episiotomy, perineal support techniques).
- Very small number of Asian-born women who had a water birth (n = 17).

RESULTS

OASI RATE BY COUNTRY OF BIRTH AND WATER BIRTH STATUS

Country of Birth Group	Birth Type	OASI (n)	Total (n)	OASI Rate (%)
Non-Asian	Non-water birth	65	4,883	1.3%
	Water birth	10	301	3.3%
Asian	Non-water birth	32	1,518	2.1%
	Water birth	0	17	0%*

*No cases of OASI occurred among 17 women born in Asian countries who had a water birth.

OASI INCIDENCE IN LAND (NON-WATER) BIRTHS

Among women who had land-based (non-water) birth (n = 6,401):

1.5%

(97 OASI cases)

ASSOCIATION WITH SPONTANEOUS LABOUR VS IOL

(Among land-based births only)

Labour Type	OASI (n)	Total (n)	OASI Rate (%)
Spontaneous labour	68	4,330	1.6%
Induction of labour	29	2,071	1.4%

Crude OR (IOL vs Spontaneous) 0.86 (95% CI 0.56 – 1.31), p = 0.49

INDUCTION OF LABOUR AND WATER BIRTH

Among all women with induction of labour (n = 2,071):



2,071

Total induced labours



8 (0.4%)

Had water birth

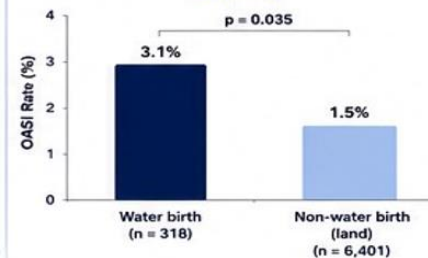


0 (0%)

Had OASI

Water birth following induction was very uncommon and no OASI occurred.

OASI RATE BY WATER BIRTH STATUS (ALL WOMEN)



KEY TAKE-HOME MESSAGE



Water birth was independently associated with increased odds of OASI after adjustment for parity, birthweight and country of birth.

Women born in Asian countries also demonstrated an independently increased risk of OASI.

ABBREVIATIONS

OASI = Obstetric Anal sphincter injury

OR = Odds Ratio

CI = Confidence Interval

SD = Standard Deviation

IOL = Induction of Labour

BMI = Body Mass Index

CONTACT

Arinajeet Bhullar, Obstetrics and Gynaecology,
Eastern Health

Email: Arinajeet.Bhullar@easternhealth.org.au