



The impact of smoking on obstetric anal sphincter injury in nulliparous women

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INTRODUCTION

- Obstetric anal sphincter injury (**OASIS**) sustained during labour can have significant impacts on **quality of life** and can lead to faecal incontinence, chronic pain and dyspareunia.
- Current rates of OASIS during vaginal delivery in Australia are between **2.7% - 6.6%**.
- Few studies have examined **modifiable lifestyle factors** in relation to OASIS
- Smoking** is a modifiable factor which has adverse effects during pregnancy
- It also has dose-dependent effects on connective tissue and collagen which is important in the **biomechanics** of OASIS.
- Currently, there is a gap in the literature as to whether being a current smoker at time of delivery influences risk of sustaining OASIS in Australian population.

Findings from large international studies:

- Raisanen et al. 2012 found that women who were currently smoking at time of delivery had a decreased odds of sustaining OASIS compared to women who were non-smokers (aOR 0.72 95% CI 0.62 - 0.84), after adjusting for background variables (1)
- Baghestan et al. 2010 found a decreased odds (OR 0.6, 0.6-0.7) for smokers compared to non smokers (2)
- Baumann et al. 2007 showed a decreased odds for smokers (OR 0.80, 0.70-0.90) in population of 40,923 German women. (3)
- McPherson et al. 2014 showed decrease in odds for smokers when compared to non smokers (OR 0.58, 0.38-0.87), and proposed this variable should be part of a risk prediction score for OASIS. (4)
- Meister et al. 2016 showed tobacco use had decrease in odds 0.83 (0.72-0.97) compared to women with no tobacco (5)
- Waldenstrom et al. 2017 showed current smokers had odds 0.71 (0.76-0.86) compared to non smokers (6)

OBJECTIVES

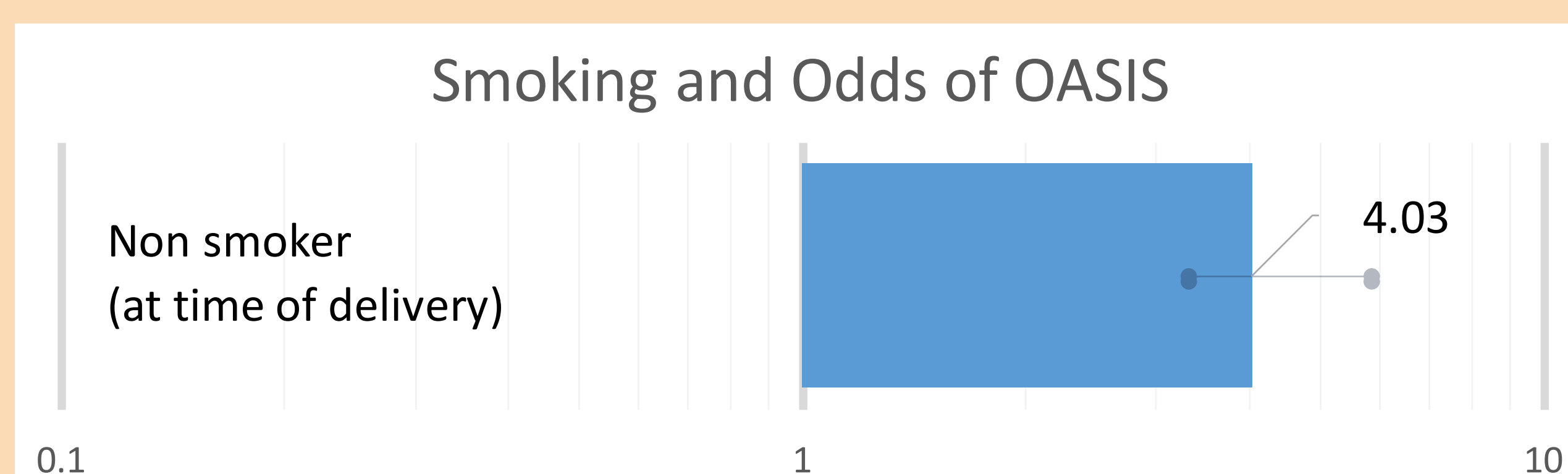
- To investigate the impact of currently smoking at time of delivery on the rate of obstetric anal sphincter injury among nulliparous women in Victorian population.
- To investigate other risk factors for obstetric anal sphincter injury in this population.

METHODS

- This was a retrospective study which included nulliparous women with singleton, vaginal deliveries ≥ 37 weeks at a major Victorian regional centre between 2007-2017 (**n=3335**).
- Women were grouped as **current smokers at time of delivery (597)** or **non-smokers** at time of delivery (**2738**), and rates of OASIS evaluated.
- Univariate analysis:** Pearson's Chi Square and binary logistic regression were performed to determine unadjusted odds ratio
- Data was considered statistically significant at $p < 0.1$ for inclusion in multivariable model.
- Multivariable logistic regression** was used to calculate adjusted odds-ratios and 95% confidence intervals.
- All statistics performed by SPSS (Version 23, IBM Corporation)
- Ethics approval: Ballarat Health Services Human Research Ethics Committee

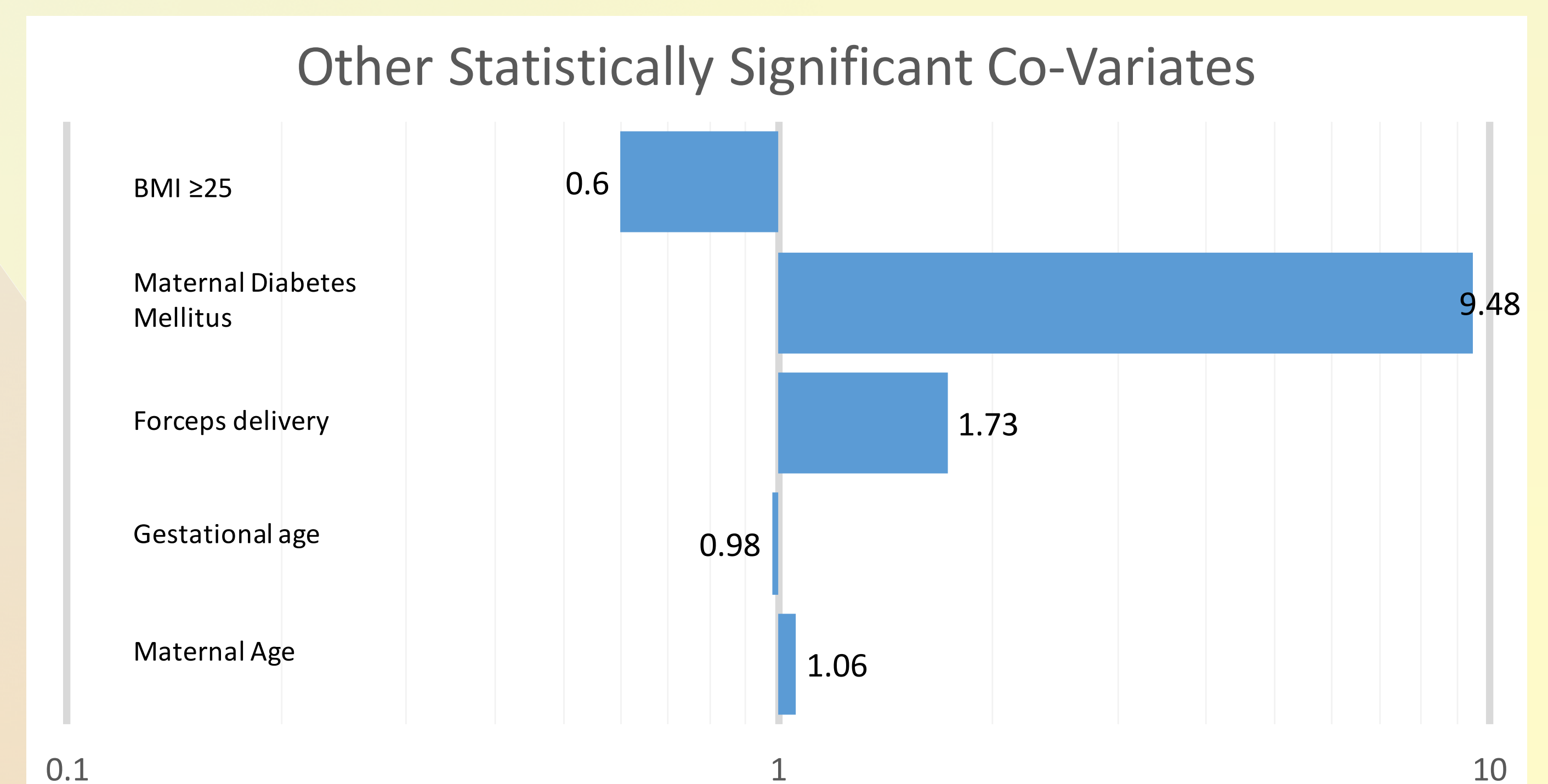
RESULTS

Maternal Smoking Status	Adjusted OR (95% CI)	p-value
Non smoker (at time of delivery)	4.03 (1.46-11.1) *	0.007
Current smoker (time of delivery)	1.00 (Reference)	



- Women who were non-smokers at time of delivery had a statistically significant increase in odds of sustaining OASIS compared to current smokers (**aOR 4.0, 95% CI 1.5-11.1, p value 0.007**)
- This is after adjusting for birth-weight and other factors showing significant association with OASIS in univariate analysis.
- Other statistically significant risk-factors in multivariable analysis were maternal age, birth weight, BMI < 25 , forceps delivery and maternal pre-existing diabetes.

Significant Covariates (included in multivariable analysis)	Adjusted OR (95% CI)	p-value
Maternal Age (years)	1.06 (1.03-1.10)	0.000*
Birth Weight (grams)	1.00 (1.00-1.00)	0.000*
Gestational age (weeks)	0.98 (0.85-1.19)	0.848
Duration of active second stage (minutes)	1.00 (0.999-1.003)	0.324
Birth Mode		
Forceps	1.73 (1.11-2.69)*	0.015*
Vacuum	0.56 (0.29-1.09)	0.087
BMI ≥ 25	0.60 (0.41-0.89) *	0.011*
Pre-existing Diabetes mellitus	9.48 (2.17- 41.42) *	0.003*



CONCLUSIONS

- Women who were current smokers at time of delivery had a decrease in odds of OASIS than non-smokers.
- This is similar to findings from other international studies, shown in an Australian setting.
- Smoking may modify OASIS risk through effects on collagen or connective tissue and further research is warranted to understand this protective effect.
- This research contributes to knowledge of OASIS risk factors and clinicians could start to include smoking status when assessing overall OASIS risk.

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