

Epidural-mediated effects of obesity on interventional birth differ between primiparous and parous women

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Introduction

The mechanisms linking obesity to increased interventional birth rates¹ may differ by parity due to distinct labour physiology. We examined whether epidural use and timing explain any of the obesity-intervention relationship in primiparous and parous women.

Methods

We examined all non-elective, term, singleton births in NHS Lothian (2022–2024), excluding births indicated for labour dystocia.

Separate analyses were conducted in primiparous and parous cohorts.

Exposure was obesity (BMI ≥ 30 vs <30 kg/m²) and outcome was interventional birth (caesarean or mid-cavity forceps).

Mediation analysis examined whether obesity's effect operated through epidural use (yes/no) and early timing (≤ 5 cm vs >5 cm) amongst epidural users.

Models were adjusted for deprivation, labour onset, age, gestation, membrane rupture duration and birth weight.

References

1. Chu SY, Kim SY, Schmid CH, et al. Maternal obesity and risk of cesarean delivery: a meta-analysis. Obesity Reviews: An Official Journal of the International Association for the Study of Obesity 2007;8(5):385–94.
2. Kearns RJ, Kyzayeva A, Halliday LOE, et al. Epidural analgesia during labour and severe maternal morbidity: population based study. BMJ 2024:e077190.

Acknowledgements

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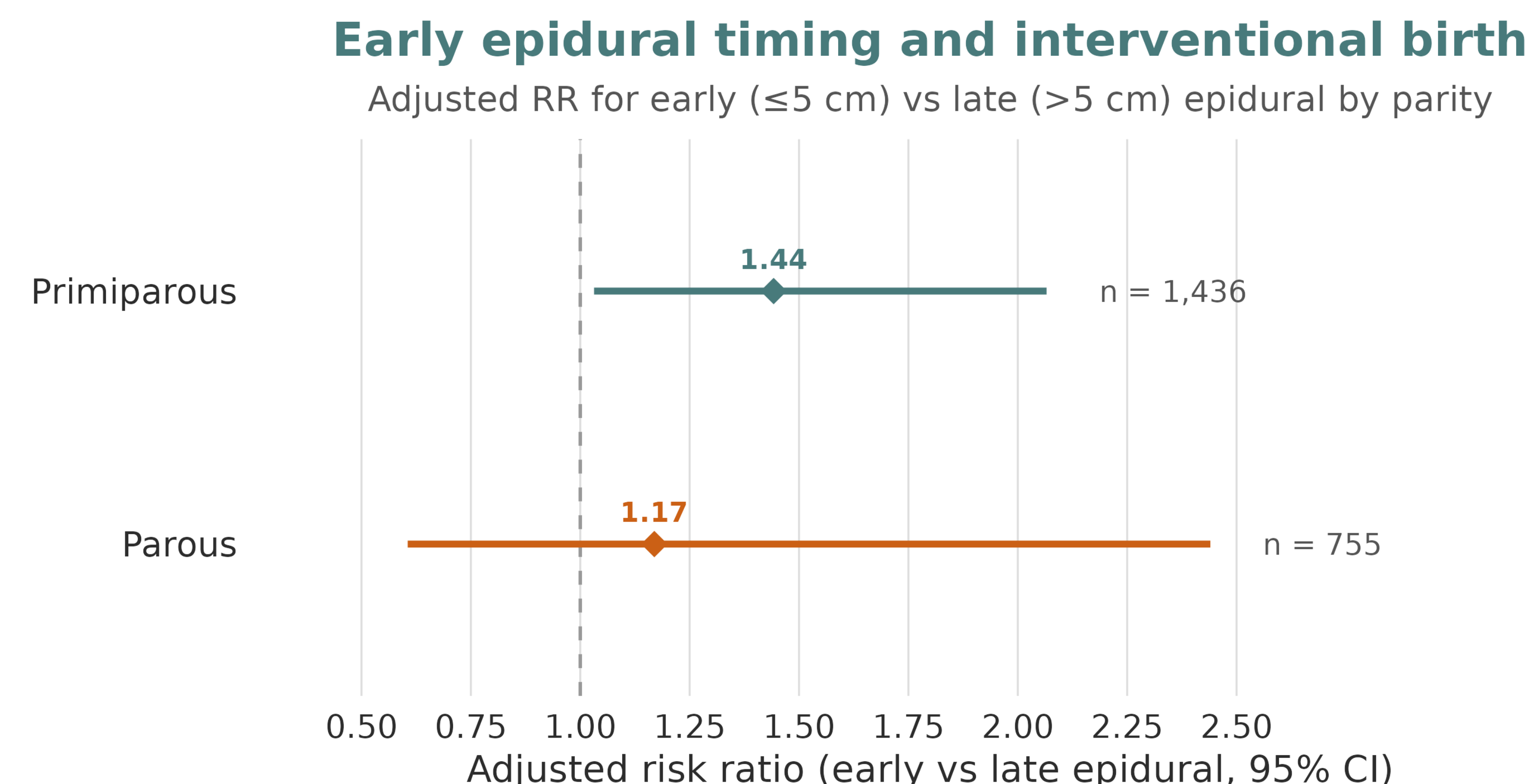


Figure 1: Adjusted risk ratio for early (≤ 5 cm) vs late (>5 cm) epidural timing and interventional birth by parity, among epidural users living with obesity.

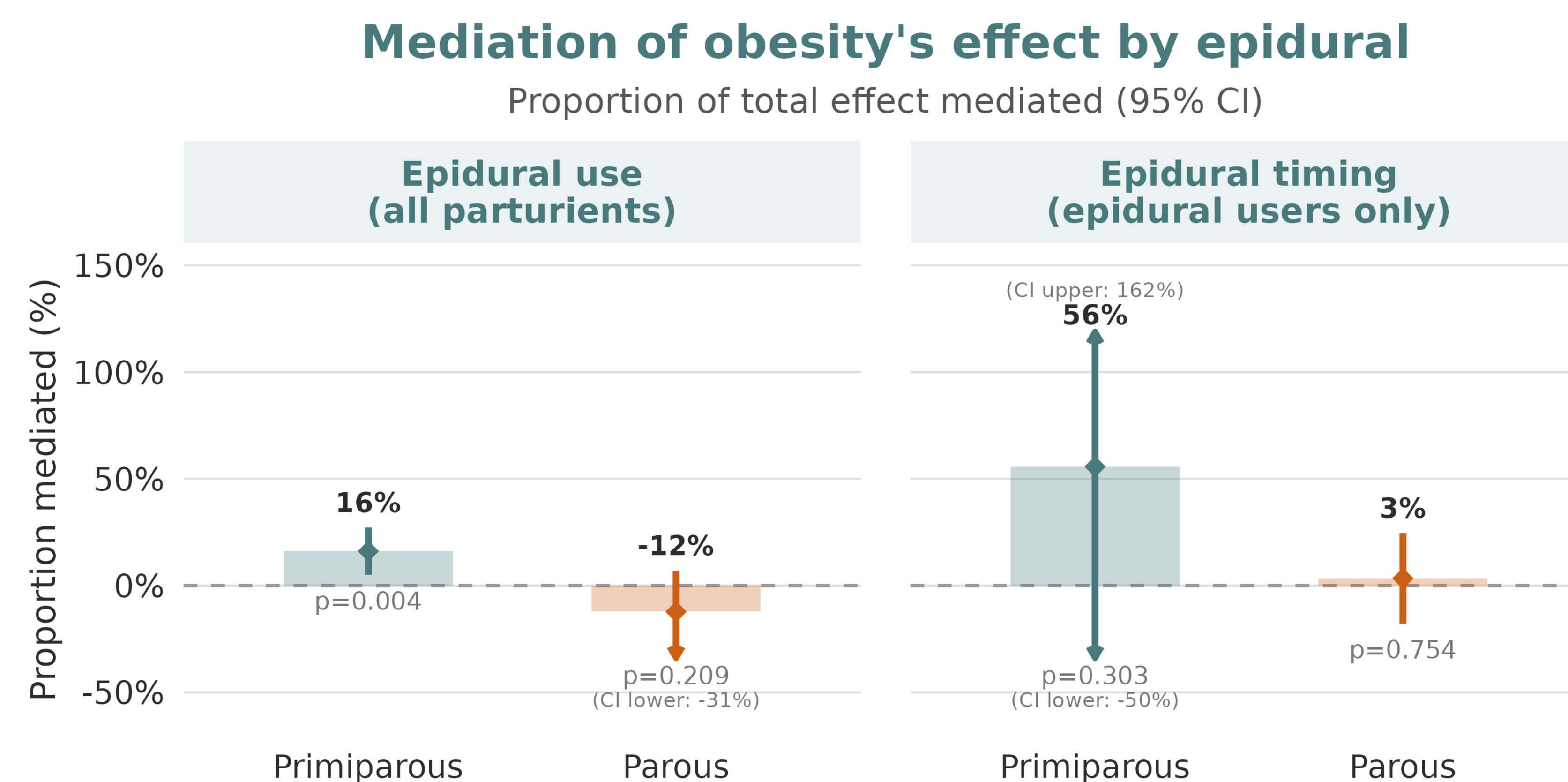


Figure 2: Proportion of obesity's excess intervention risk mediated by epidural use and timing, by parity. Bars show point estimates; lines 95% CI

Results

9,058 births were included (4,761 primiparous, 4,297 parous).

Intervention was higher in obese versus non-obese parturients in both groups (51.2% vs 41.9% primiparous; 18.9% vs 16.1% parous).

In primiparous women, epidural use explained 16% (95% CI 5–27%, $p=0.004$) of obesity's effect on intervention.

Among primiparous epidural users, early timing was associated with higher intervention rates (Figure 1).

In parous women, epidural-related pathways did not explain obesity's effect (Figures 1 and 2).

Discussion

Epidural-related pathways partially explain the association between obesity and interventional birth in primiparous women.

This does not imply that epidurals drive intervention; epidurals have important analgesic and safety benefits². However, for primiparous women living with obesity, shared decision-making conversations should consider epidural timing and the broader factors linking obesity to intervention.

In parous women, obesity's association with intervention operates through non-epidural mechanisms, and counselling should reflect this.

Confidence intervals for the timing mediation are wide. A multicentre study is underway to provide the power needed to answer this definitively.