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COVID-19 and Category 1 Caesarean Sections: Effect of Anaesthetic Practice Changes on Maternal and Neonatal Outcomes

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Introduction

National obstetric guidelines produced during the COVID-19 pandemic recommend avoiding general anaesthesia unless absolutely necessary.[1] GA is an aerosol generating procedure – presenting potential risk to neonates, staff and other patients.[2] Within our tertiary centre, we implemented both nationally and locally agreed changes in practice, aiming to reduce recourse to GA (Table 1). We aimed to investigate the associations of these practice changes on anaesthetic technique for category-1 caesarean section and on obstetric and neonatal outcomes

Obstetric Changes	Anaesthetic Changes
Early senior obstetric decision making	Appropriate PPE required for all staff entering theatre
Early recourse to caesarean section if CTG concerning (avoiding delays introduced by fetal blood sampling)	Patient's backs sprayed with 0.5% chlorhexidine as first task upon entering theatre, to reduce time delay with drying
Avoidance of artificial rupture of membranes in women with CTG concerns	Additional overnight staffing – increase from one resident anesthetist to two
Proactive use of intra-uterine fetal resuscitation	Supply of pre-drawn sterile 300µg diamorphine syringes
	24-hour resident consultant anesthetist delivered care

Table 1: Obstetric & anaesthetic changes introduced during COVID-19 pandemic

Methods

Caldicott Guardian approval was obtained and requirement for formal ethical approval deemed unnecessary by the West of Scotland Research Ethics Service. Data were collected for all category-1 caesarean sections during the initial two months of the coronavirus pandemic (27/3/20–27/5/20). This was compared to the preceding 13 month period (01/03/19 – 26/03/20), representing standard care delivered by a mixture of trainees and consultants, where additional PPE was not required, and without restrictions on GA use. Analyses were restricted to livebirths where a decision to deliver via category-1 caesarean section was made prior to operating theatre arrival. Data were summarised using median [inter-quartile range] and count (%). Analyses were performed using Pearson exact and Wilcoxon rank sum testing, utilising R version 3.6.2 (R Foundation for Statistical Computing).

Results

In the control group, 122 patients delivered by category-1 caesarean section, with 18 patients in the COVID-19 cohort. There were 3 cases with missing data in the control cohort (n=119). No changes were observed in rates of category-2 and -3 cesarean sections between cohorts (124 versus 126 respectively over equivalent 2- month periods). Comparison of studied variables are as shown in table 2.

Measure	Control Cohort (n=119)	COVID-19 cohort (n=18)	p value
Mode of Anaesthesia			
GA	48/119 (40.3%)	0/18 (0%)	
Epidural Top-up	19/119 (16.0%)	2/18 (11.1%)	**<0.01**
Spinal	51/119 (42.9%)	16/16 (88.9%)	
Regional to GA Conversion	1/119 (0.8%)	0/19 (0%)	
Decision-to -delivery interval, median [IQR], min	25 [16-31]	27.5 [19.8-33.0]	0.42
Neonatal resuscitation, No. (%)	37 (31.1%)	4 (22.2%)	0.48
Apgar <7 at 5 minutes, No. (%)	10 (8.4%)	1 (5.8%)	0.68
Admission neonatal unit, No. (%)	25 (21.0%)	6 (33.3%)	0.22

Table 2: Comparison of anaesthetic techniques, obstetric and neonatal outcomes between cohorts

Discussion

We demonstrate a marked reduction in GA usage during with COVID-19 pandemic, with a doubling of rates of spinal anaesthesia. This was achieved with no significant difference in decision-to-delivery time and without adversely affecting foetal outcome. Whilst our numbers are small and all implemented changes may not be sustainable long-term, the similar outcomes demonstrated (and the potential additional benefits of avoiding GA) mean reverting entirely to 'old-normal' practices may be neither desirable or justifiable.

References

1.The Faculty of Intensive Care Medicine, Association of Anaesthetists, Royal College of Anaesthetists and Obstetric Anaesthetists' Association. Management of pregnant women with known or suspected COVID-19.

2.Tran K, Cimon K, Severn M et al. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One. 2012; 7: e35797.