

Achieving the 75 Minutes Decision to Delivery Interval for Category 2 Emergency Caesarean Section

What is Causing the Delay?

C Wang¹, T Rudra¹

1. Royal Brisbane and Women's Hospital, Herston, QLD, Australia

Contact: chuanwangmbbs@gmail.com

INTRODUCTION

The NICE guidelines have recommended a 75 mins decision to delivery interval (DDI) for Category 2 emergency Caesarean section (Cat 2 Em CS). Previous research found that not meeting the recommended DDI may be associated with adverse perinatal outcomes (1, 2). Other study did not demonstrate the same result (3).

However, very little research has been done to explore the reasons why the recommended DDI is not being met. Moreover, there is very little Australian data on this topic. The aim of this study is to determine how well an Australian tertiary maternity department is able to in meet that target and identify any causes for delays

METHODOLOGY

Design

- Retrospective cohort study using data gathered from the birth register and medical charts
- Time frame: 01/01/2019 to 31/12/20
- Location: Royal Brisbane and Women's Hospital, a tertiary maternity hospital in Brisbane, Herston, QLD, Australia

Population

- Inclusion criteria:
 - All women who underwent Cat 2 Em CS at gestational age $\geq 23+0$ were included in the analysis of maternal demographics -- 1207
 - All babies that were alive at time of delivery were included in the analysis of neonatal demographics -- 1263
- Exclusion criteria:
 - Women who delivered at gestational age $<23+0$
 - Babies that were diagnosed as intrauterine fetal demise prior to CS were excluded

Outcomes

- Primary Outcomes:
 - Percentage of Cat 2 Em CS that was able to achieve the 75 mins DDI
 - Average delay in mins of Cat 2 Em CS that did not meet the recommended DDI
 - Documented reasons for failing to realize the 75 mins DDI

Statistical analysis

- Analysis was performed with GraphPad Prism
- Student T-test used to compare normally distributed continuous data
- Pearson's chi-squared or Fisher's exact tests were used to compare categorical variables
- P-value <0.05 was taken as statistically significant

MATERNAL AND NEONATAL DEMOGRAPHICS

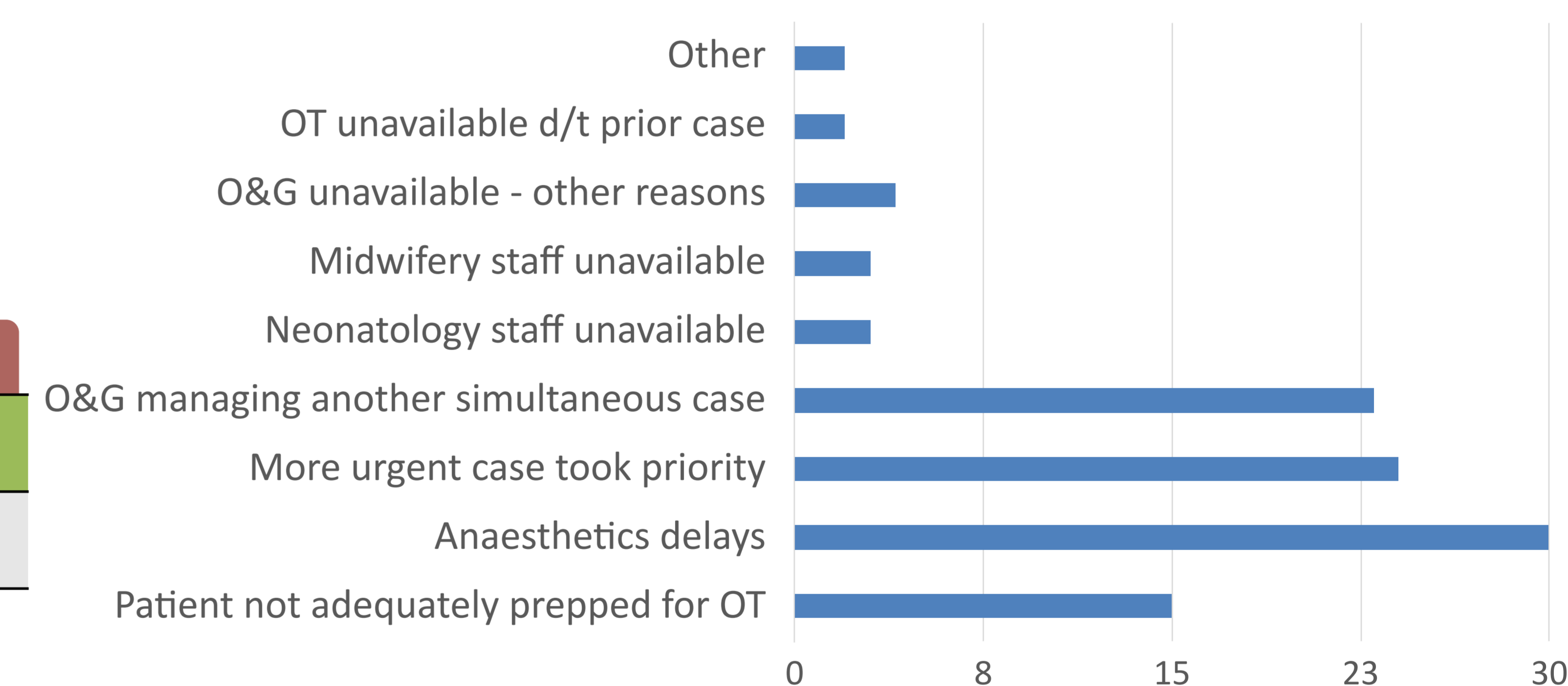
Maternal Characteristics	Total	DDI (≤ 75 mins) Achieved	DDI NOT Achieved	P-Value (<0.05)
Maternal Age	(n = 1207)	(n = 639)	(n = 568)	
- Mean \pm SD (yrs)	30.8 \pm 5.1	30.9 \pm 4.9	30.8 \pm 5.3	0.99
BMI*	(n = 1179)	(n = 621)	(n = 558)	
Mean \pm SD (kg/m ²)	25.9 \pm 6.2	25.5 \pm 5.4	26.5 \pm 6.9	0.004
- BMI ≥ 40 (%)	3.3% (39/1179)	2.0% (13/637)	4.7% (26/558)	
Ethnicity	(n = 1207)	(n = 639)	(n = 568)	
- Caucasian	64.1% (774/1207)	61.8% (395/639)	66.7% (379/568)	
- ATSI	3.0% (36/1207)	2.8% (18/639)	3.2% (18/568)	
- Asian	8.8% (106/1207)	8.8% (56/639)	8.8% (60/568)	0.3558
- Indian subcontinent	8.5% (103/1207)	8.9% (57/639)	8.1% (46/568)	
- Pacific Islander	3.0% (35/1207)	3.1% (20/639)	2.6% (15/568)	
- Other	12.7% (153/1207)	14.6% (93/639)	10.6% (60/568)	
Smoking[^]	(n = 1197)	(n = 633)	(n = 564)	
- %	5.7% (68/1197)	5.2% (33/633)	6.2% (35/564)	0.5320
Parity	(n = 1207)	(n = 639)	(n = 568)	
- Nulliparous (%)	69.6% (840/1207)	76.53% (489/639)	61.80% (351/568)	<0.0001
- Multiparous (%)	30.4% (367/1207)	23.47% (150/639)	38.20% (217/568)	
Plurality	(n = 1207)	(n = 639)	(n = 568)	
- Singleton	95.1% (1148/1207)	96.7% (618/639)	93.3% (530/568)	0.0072
- Multiple preg	4.9% (59/1207)	3.3% (21/639)	6.7% (38/568)	
Onset of labour	(n = 1207)	(n = 639)	(n = 568)	
- Spont	43.5% (525/1207)	45.1% (288/639)	41.7% (379/568)	
- Induced	34.2% (413/1207)	38.3% (245/639)	29.6% (18/568)	<0.0001
- No labour	22.3% (269/1207)	16.6% (106/639)	28.7% (60/568)	
Analgesia use	(n = 1207)	(n = 639)	(n = 568)	
- Regional	90.2% (1089/1207)	91.1% (582/639)	89.3% (507/568)	0.4227
- General	8.0% (96/1207)	7.5% (48/639)	8.4% (48/568)	
- Regional \rightarrow GA	1.8% (22/1207)	1.4% (9/639)	2.3% (13/568)	

* 28 women didn't have BMI recorded
^ 10 women didn't have smoking status recorded

Neonatal Characteristics	Total	DDI (≤ 75 mins) Achieved	DDI NOT Achieved	P-Value (<0.05)
Sex	(n = 1263)	(n = 660)	(n = 603)	
- Male	54.9% (693/1263)	55.2% (364/660)	54.6% (329/660)	0.8652
- Female	45.1% (570/1263)	44.8% (296/660)	45.4% (274/660)	
Gestational Age	(n = 1263)	(n = 660)	(n = 603)	
- Mean \pm SD (yrs)	38w0d \pm 3w5d	38w2d \pm 3w4d	36w6d \pm 4w1d	<0.0001
- GA $< 37+0$ (%)	24.7% (310/1207)	19.2% (122/637)	33.0% (188/570)	
Birthweight	(n = 1263)	(n = 660)	(n = 603)	
- Mean \pm SD (g)	3044 \pm 931.5	3157 \pm 842	2920 \pm 1007	<0.0001

- Approximately half, **52.8% (637/1207)**, were able to achieve the recommended 75 mins DDI
- There was an average of **63mins** delay in the "DDI NOT achieved" cohort
- Babies in the "DDI NOT achieved" group tend to have:
 - Younger gestational age
 - Lower birthweight
- When compared to the "DDI achieved" cohort, women in the "DDI NOT achieved" are more likely to be/have:
 - Overweight
 - Multiparous
 - Multiple pregnancies
 - Not in labour
- Top 4 reasons for delays were:
 - Anaesthetics delays**
 - A more urgent case took priority**
 - O&G staff unavailable b/c they were managing another concurrent emergent case**
 - Patient was not adequately prepped for OT**

DOCUMENTED REASONS FOR DELAY IN ACHIEVING 75MINS DDI



** Only 106/570 of the "DDI NOT Achieved" cohort had appropriately documented reasons for delay

DISCUSSION/CONCLUSION

Having a dedicated 24/7 obstetric operating theatre did not guarantee that the 75mins DDI could be achieved. In fact, it was only achieved about 50% of the time

Prematurity may have played a role with not meeting this target. This can be seen by the general lower average birthweight and younger gestational age in the "DDI Not Achieved" group. Multiple pregnancies were also more likely to be found in this cohort and they are known to be associated with premature birth as well.

Women with higher BMI have increased obstetric and anaesthetic risks, which will require additional medical input and supporting staff to manage their pregnancies. Thus, they may be more challenging to transport to the operating theatre and anaesthetize in a Cat 2 Em CS, which could also explain the delay.

In conclusion, more resources are required to address anaesthetics issues, medical staff shortage, theatre availability in order to meet the recommended DDI for Cat 2 Em CS.

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