

Exploring the delivery of optimally timed antenatal corticosteroids in women delivering preterm at Guy's and St Thomas' NHS Foundation Trust

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Introduction

- Preterm birth (PTB) defined as babies born alive before 37 weeks of gestation of completed pregnancy (WHO 1977) and affects around 8% of all live births in England and Wales (1).
- PTB is the main contributing factor to neonatal and infant morbidity and mortality.
- Antenatal corticosteroids (ACS) assist fetal lung maturation and are administered in suspected preterm birth to reduce the risk of respiratory distress syndrome and other complications.
- ACS should be given between 24 hours and 7 days prior to a women suspected to deliver, before 34 weeks and 6 days gestation (2) – this is deemed the optimal window.
- A single rescue dose may be given more than 7 days after a full course of ACS has been administered and delivery is imminent.
- Getting the timing right of administration of ACS is incredibly challenging.
- Approximately 40% of women receive steroids within a preterm gestation, however go on to deliver at term.
- Some evidence has shown a shorter steroid administration to birth interval could be as effective (3,4).
- An interval as short as 6 to 12 hours could decrease mortality by 50% (4).

Results

- 191 women were included.
- 23 women (12%) received no ACS.
- 34 (18%) received a single dose.
- 134 (70%) received a complete course of steroids but only 68 (36%) were considered optimally timed.
- 34% therefore delivered outside the window of maturity.
- 17 (9%) received a repeat dose of steroids prior to delivery.
- 33 women were eligible to receive a repeat course of steroids, meaning 16 women did not receive a rescue dose when should have.

- Data was collected on additional preterm optimization interventions as per the saving babies lives care bundle (5) including mode of delivery, benzylpenicillin administration for GBS prophylaxis, magnesium sulphate administration and in utero transfers from other units. These will be further analyzed by our team.

- Spontaneous vaginal deliveries (SVD) higher in women who had no ACS compared to those who received in optimal timing (39% vs 25%).
- Similarly spontaneous cause for PTB higher in women who had no ACS.

Preterm delivery characteristics	Total n = 191	Steroid mature n = 68	Not steroid mature n = 123
Caesarean section delivery	130 (68%)	49 (72%)	81 (66%)
Spontaneous vaginal delivery	54 (28%)	17 (25%)	37 (30%)
Operative vaginal delivery	7 (4%)	2 (3%)	5 (4%)
1 st dose of steroid given	168 (88%)	68 (100%)	100 (81%)
2 nd dose of steroid given	134 (70%)	68 (100%)	66 (54%)
Repeat dose of steroid given	17 (9%)	5 (7%)	12 (10%)
Admission less than 6 hours before delivery	34 (18%)	2 (3%)	32 (26%)
Admission more than 24 hours before delivery	113 (59%)	57 (84%)	56 (46%)
In utero transfer	28 (15%)	9 (13%)	19 (15%)
Iatrogenic cause of preterm labour	66 (35%)	30 (44%)	36 (29%)
Spontaneous cause of preterm labour	77 (35%)	24 (35%)	53 (43%)
Emergency cause of preterm labour	28 (15%)	7 (10%)	21 (17%)
Chorioamnionitis	20 (11%)	7 (10%)	13 (11%)

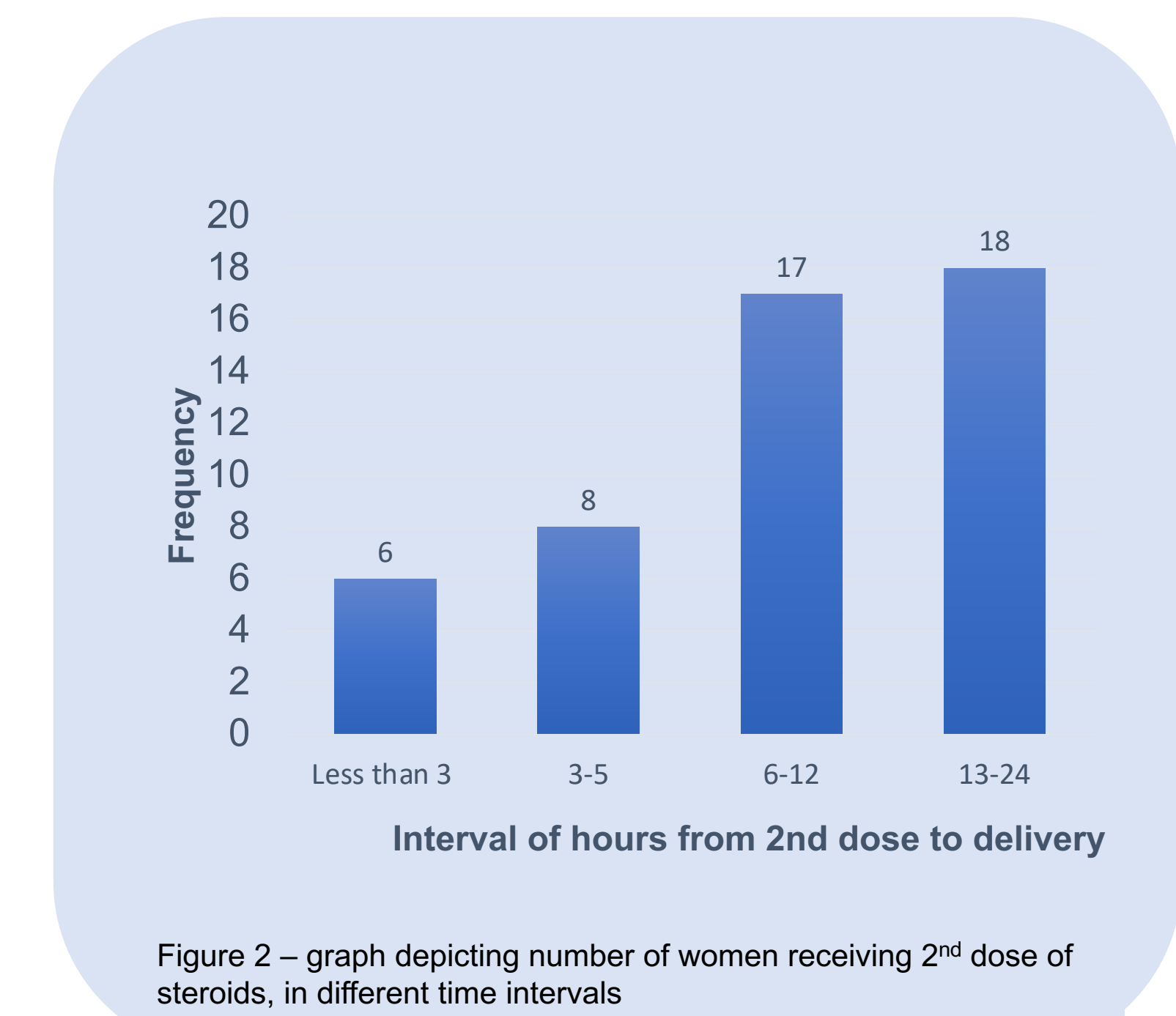
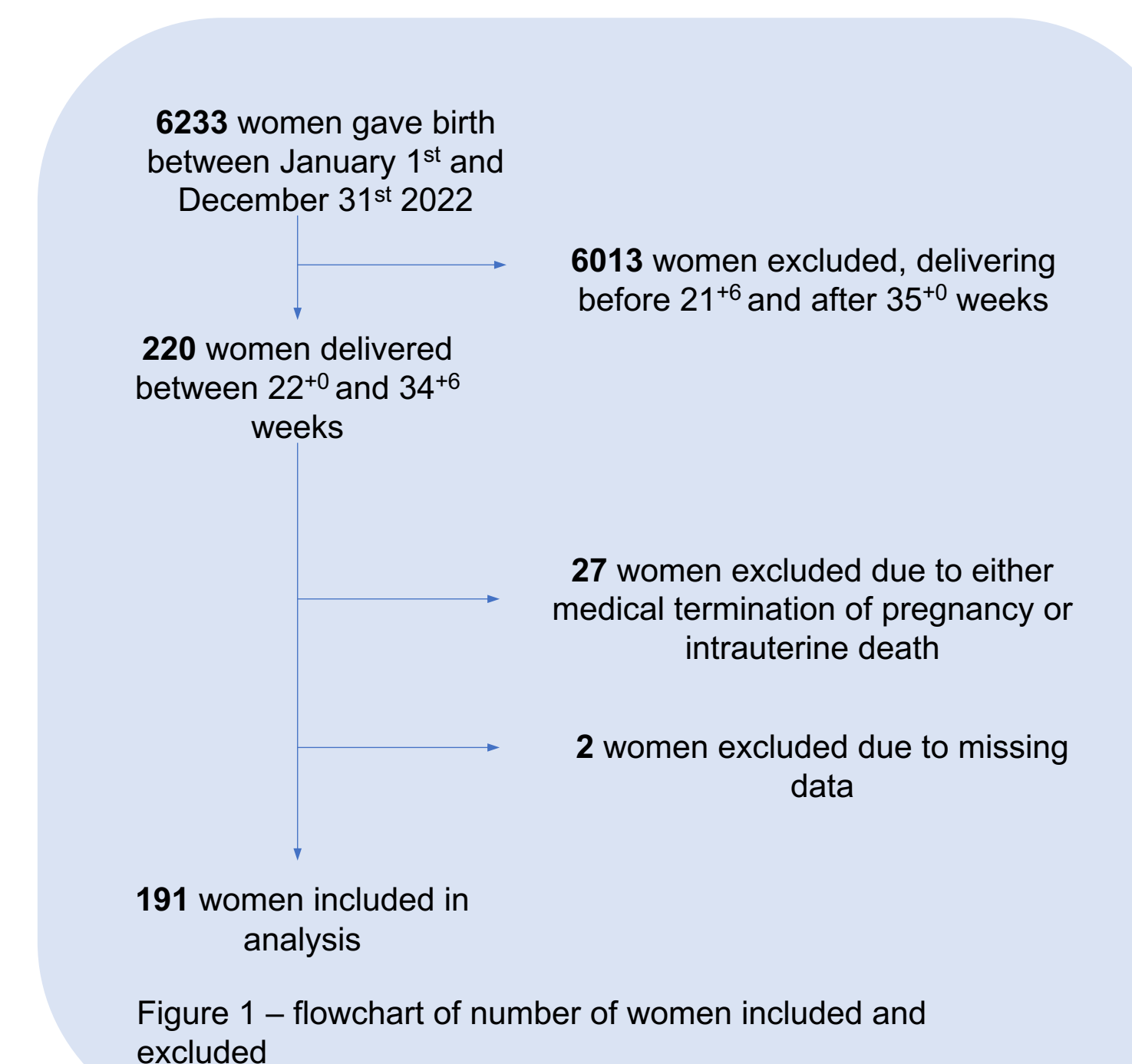
The percentage given is derived from the total number in the respective column

Figure 3 – table of results

- Data categorized further into:
 1. Steroid mature vs not steroid mature
 2. Administration to birth interval of ACS
 - No ACS
 - <24 hours
 - 24-47 hours
 - 48 hours – 7days
 - >7 days
 3. Interval from 2nd dose of steroid to delivery
 - <3 hours
 - 3-5 hours
 - 6-12 hours
 - 13-24 hours

Methods

- Retrospective systematic chart analysis of preterm deliveries between 1st January 2022 and 31st December 2022 at Guy's and St Thomas' NHS Foundation Trust, using electronic maternity records
- Inclusion criteria:
 - Women delivering between 22⁺⁰ and 34⁺⁶ gestation in the year 2022 at Guy's and St Thomas' Hospital
- Exclusion criteria:
 - Women delivering outside this gestational range
 - Intrauterine death
 - Medical termination of pregnancy
 - Fatal fetal abnormalities
 - Women who received steroids and progressed to term



Discussion

- Getting ACS timing right is clearly a challenge, as less than 50% received steroids optimally.
- The proportion of women receiving steroids optimally and the proportion of women not receiving any ACS is comparable to other studies, highlighting the challenge further.
- Spontaneous deliveries are evidently even more difficult to predict, as are emergencies and therefore women delivering preterm in these scenarios are the most at risk of not receiving optimal ACS.
- Women with an iatrogenic cause for PTB are the most likely to receive steroids optimally, and it could be deemed appropriate to use the same amount of caution for women who spontaneously go into preterm labour as we do with those who have an iatrogenic cause for PTB.

- Many women received a second dose of steroids less than 24 hours before delivery
 - Calls into question whether there needs to be a change in definition of optimal steroid window, as we are aiming for an optimal window that was defined arbitrarily more than 40 years ago
- Education on rescue dose – 16 women did not receive a rescue dose when should have and 12 women did not receive the rescue dose in the correct time frame
 - Some clinicians not giving a rescue dose because of misunderstanding of the current guidance, therefore this should be reinforced
- Improve consistency and accuracy of recording obstetric data
 - Uniform recording between departments which will make it easier for clinicians to be informed of whether steroids have been given and make future research easier
- Educate women, particularly primiparous women on signs of preterm labour as primiparous women are most at risk of PTB
- Share this information for quality improvement interventions to be recommended to improve timing of administration

References

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