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Safety and feasibility of delivery room cuddles in infants with surgical defects: A quality improvement project

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ABSTRACT

Background: Delivery Room Cuddles (DRC) is a growing practice with recognized benefits for parent-infant bonding, breastfeeding rates, and infant stress responses.

Methods: We introduced DRC at St. Mary's NICU, Manchester, in October 2020. As part of a formal QI process, we have been continuously collecting data on all babies admitted to our NICU from the delivery suite to review rates of DRC and monitor for any beneficial effects / adverse events.

From October 2020 to May 2021, we admitted 41 babies with known surgical defects; 56% of whom had a DRC, including intubated babies with congenital diaphragmatic hernias, and babies with open surgical defects.

Results: There have been no adverse incidents directly related to DRC and more babies who had a DRC received breast milk than those who did not

Conclusion: Our study demonstrates that DRC can be implemented safely in surgical babies.

INTRODUCTION

After initial stabilisation at birth, surgical babies are often taken straight to NICU without direct contact with parents. The reasons are multifactorial and include clinicians feeling uncomfortable facilitating cuddles for infants with severe surgical defects, and the desire for the baby to be reviewed by the surgical team. The admission to NICU without direct parental-baby contact disrupts the bonding process and decreases maternal behaviours.[1]

We know from experience that in the first few days to weeks of admission for surgical babies, cuddles or skin-to-skin contact (SSC) are difficult to facilitate, and it can be weeks before opportunities for cuddles arise.

There are many proposed benefits of early SSC proven in healthy term babies. These include improved stress responses, improved attachment and bonding with parents,[2] and an increased likelihood of exclusive breastfeeding.[1]

We believe all infants should be offered cuddles as soon as possible, ideally as DRC. DRC is already standard practice in some neonatal units in the UK. However, as far as we are aware, this is the largest published case series of DRC being offered safely to surgical babies.

We undertook a retrospective review of inborn babies with antenatally diagnosed congenital surgical defects between October 2020 - May 2021 to review uptake of DRC and identify any trends in expressed breastmilk (EBM) feeding rates, and occurrence of any adverse events.

METHODS

St. Mary's NICU, Manchester, is a large tertiary unit with paediatric surgery onsite.

In October 2020 we introduced a Quality Improvement Project (QIP) with the aim to facilitate delivery room cuddles (DRC) for all babies admitted to NICU from delivery. We defined DRC as an opportunity prior to admission for one or both parents to hold their newborn. We were not prescriptive about the length of the cuddle, leaving it down to the team present to decide.

To implement DRC, we first carried out a survey to review colleagues' expectations and opinions. Among 42 respondents (including nurses, consultants, and

junior doctors), 40% felt that babies with CDH should not be offered a DRC, while 38% felt that babies with gastroschisis or exomphalos should not be offered one.

We collected baseline retrospective data to review uptake of DRC for inborn babies admitted from delivery, prior to implementing our QIP. Our baseline dataset included gestational age, birth weight, documented DRC, admission temperature and blood glucose, time to admission, rates of EBM feeding, and how long babies waited for a first cuddle if they did not have DRC.

We performed a literature review and reviewed practices in other centres in the UK where DRC is established. We communicated with these units who have already successfully implemented DRC, including Imperial College London, Southwestern Hospital, Liverpool Women's Hospital, and Norwich Hospital. This reassured us that DRC could be implemented safely and allowed us to develop a project proposal with a strong argument in favour of implementing DRC in our unit. This proposal was accepted at a QIP meeting and we have been facilitating DRC as a standard since October 2020.

To assist with data collection, and to act as a reminder to clinicians to offer DRC, a drop-down box was added to the electronic admission document for the admitting medical practitioner to enter whether DRC was facilitated, and if not facilitated, there was an option to type the reason for this.

This QIP was promoted throughout its duration with newsletters being emailed out to all NICU staff every 2 months, presentations at audit meetings, and posters being placed on NICU and labour ward to remind staff to offer DRC. We also developed a standard operating procedure (SOP) to be followed when offering DRC to parents.

Although our QIP applied to all inborn babies, for the purposes of this review we have selected the data of babies who had antenatally diagnosed congenital surgical defects.

Chi-squared tests were performed to review if rates of EBM feeding or rates of admission hypothermia were significantly associated with DRC.

The neonatal team was present at delivery for all infants with antenatally diagnosed surgical defects. We aimed to have delayed cord clamping of at least 1 minute if they were born in good condition, and management following delivery was as per Neonatal Life Support (NLS) guidelines. Babies were taken to the resuscitaire, dried, and wrapped. If gastroschisis was present the bowel was placed in a plastic bag / wrapped in cling film on the resuscitaire, and a nasogastric tube was sited. If there was myelomeningocele, the baby was placed on the resuscitaire in a side-lying position and the defect was covered with sterile gauze soaked in saline and wrapped in clingfilm. Those with CDH were taken to the resuscitaire, intubated, and then connected to the ventilator on the transport incubator on conventional ventilation.

For all infants, once they were stable with acceptable saturations, the neonatal team would then discuss whether we were happy for DRC to be offered. If the team agreed to offer DRC we would take the baby to the mother for cuddles, and cuddles would also be offered to the other parent or birthing partner present. If the mother was too unstable for DRC or under a general anaesthetic in theatre, cuddles would still be offered to the birthing partner present.

Cuddles were not typically timed but would generally last between 1 and 5 minutes, and we would encourage and help parents to take photographs and videos.

Intubated infants would have a nominated team member to continually monitor the airway during transfer to parents' arms and during the cuddle, and a capnograph was left attached to the endotracheal tube to monitor for loss of colour change in the case of accidental extubation. Saturation probes would also be left attached to babies so we could continually monitor observations during cuddles.

The temperature would be measured before and after cuddles to ensure that DRC was not causing hypothermia on admission.

RESULTS

From the period October 1st 2020 to May 31st 2021, we identified 41 inborns who were admitted directly from delivery with antenatally diagnosed surgical defects. The mean gestational age was 36 weeks (range 31-40 weeks) and a mean BW of 2.589 kg (range 1.617 to 3.6 kg). All newborns were admitted within one hour of delivery. The average temperature on admission was 36.7 ºC (range 35.6-38 ºC) and the mean blood glucose on admission was 5.3mmol/L (0.8-11.7 mmol/L).

In the month of data collection prior to implementing DRC (September 2020), we had three inborn babies admitted to our NICU with surgical defects. Their diagnoses were: gastroschisis, congenital cystic adenomatoid malformation (CCAM), and Congenital Diaphragmatic Hernia (CDH). None of these babies had a DRC and all three waited for more than two weeks to have their first cuddle.

Overall, since the implementation of the DRC QIP, 53.66% of inborn babies with antenatally diagnosed surgical defects had a DRC with at least one parent. Table 1 shows the different surgical conditions we

have seen, with rates of DRC, rates of EBM feeding, and incidence of admission hypothermia.

Six of these babies were intubated prior to having a DRC, and there were no accidental extubations.

More infants who had a DRC received EBM (79%) than infants who did not have a DRC (73%); however, this was not statistically significant (P=0.2451, 95% confidence interval 0.851 to 1.724).

13.6% of babies who had DRC were hypothermic on admission compared to 10.5% of babies who did not have DRC. This was not statistically significant (P=0.7615, 95% confidence interval 0.730 to 1.288).

24.3% of infants were hypoglycaemic on admission with a blood sugar less than 2.6 mmol/L. Of these infants, only 30% had a DRC, whilst the other 70% did not.

Table 1: Diagnoses for all inborn infants with antenatally diagnosed surgical defects at St. Mary's Hospital, Manchester, between October 2020 and May 2021, with rates of DRC and hypothermia on admission

Type of surgical defect	Number of Infants who had DRC	Number of Infants with no DRC documented
Intestinal atresia	1	3
Gastroschisis	8	5
Intestinal Obstruction	2	0
Congenital Diaphragmatic Hernia	5	4
Cloacal Exstrophy	1	0
Myelomeningocele	3	2
Tracheooesophageal Fistula / Oesophageal Atresia	2	1
Bladder Outlet Obstruction	0	3
Intestinal Fistula	0	1
Total	22	19
Totals that received EBM	19	14
Totals with admission temperature < 36.5	3	2

DISCUSSION

Early SSC or DRC improves parent-infant attachment,[3] can improve breastfeeding rates,[1] and has been shown to have positive effects on the development of stress response mechanisms and the autonomic nervous system.[4] The effects of DRC on stress responses and pain scores could be particularly beneficial to babies with surgical defects.

As a major tertiary neonatal medical and surgical unit, a large proportion of our admissions direct from delivery are babies with antenatally diagnosed surgical defects. Many of these babies are born in good condition, and yet prior to implantation of our DRC QIP, these babies were not having DRC.

Babies born with a CDH can be relatively unstable and require a high level of intervention and support. However, once intubated in the delivery room and stabilised, it may often be appropriate (and indeed desirable) to offer a DRC. We have demonstrated in our case series that there were no adverse events associated with DRC in any intubated babies with CDH. Furthermore, babies with CDH can have an unstable postoperative course with a high mortality rate; which can make DRC even more important for bonding and memory-making.

We have also found that despite being statistically insignificant, the percentage of infants receiving EBM is higher in the cohort who had a DRC; which has its own added benefits.

Overall, there are few absolute contraindications to facilitating a DRC between parents and baby and these should be assessed on a case-by-case basis. It would be difficult to overestimate the positive impact of this once-in-a-lifetime opportunity could have. One mother of a surgical baby on our unit recently commented on her experience of DRC: "I'll never forget that moment . . . It was only 30 seconds, but it meant the world to me."[5]

We demonstrated through our study that it is possible to safely offer DRC to surgical babies with a variety of diagnoses. We believe that it should become standard practice for surgical babies on all neonatal units.

Through promoting the project and involving nursing colleagues and advanced neonatal nurse practitioners we believe we have embedded DRC into our practice. It is now standard for all infants to be offered DRC prior to admission unless there has been significant resuscitation requiring umbilical lines and emergency drugs, or if the infant is particularly unstable. Education regarding DRC and its benefits is now included in the induction programme for new doctors to help promote and continue uptake of DRC. Since completing data collection at St. Mary's NICU, we have presented our data with advice on how to

implement the same QIP at other neonatal units at a North-West Neonatal study day, which was virtually attended by clinicians from all neonatal units in the North West of England; with the aim of facilitating DRC to be offered by all units in this region as standard

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REFERENCES

1. Moore ER, Bergman N, Anderson GC, Medley N. Early skin-to-skin contact for mothers and their healthy newborn infants. Cochrane Database Syst Rev. 2016; 11:CD003519.
2. Brystova K, Ivanova V, Edhborg M, Matthiesen AS, Ransjo-Arvidson AB, Mukhamedrakhimov R, et al. Early contact versus separation: Effects on mother-infant interaction one year later. Birth. 2009; 36:97-109
3. Feldman R, Eidelman AI. Maternal postpartum behaviour and the emergence of infant-mother and infant-father synchrony in preterm and full-term infants: The role of neonatal vagal tone. Dev Psychobiol. 2007; 49:290-302
4. Cong X, Ludington-Hoe SM, Walsh S. Randomised crossover trial of Kangaroo care to reduce biobehavioural pain responses in preterm infants: A pilot study. Biol Res Nurs. 2011; 13:204-16.
5. George Edward Waites, St. Mary's Hospital Charity. Manchester Foundation Trust Charity. [Online] July 2021. [Cited: August 24th, 2021.] Available from: https://mftcharity.org.uk/patient/george-edward-waites.