

ORIGINAL RESEARCH

Quality improvement initiative to improve delayed cord clamping in term normal vaginally delivered babies

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ABSTRACT

Introduction: Delayed cord clamping has been the primary method of facilitating placental transfusion. The WHO guideline development group considered this recommendation to be equally important for caesarean sections. Recommendations for the optimal timing of umbilical cord clamping apply equally to preterm and term births. WHO recommends that in newborn babies, who do not require positive-pressure ventilation at birth, the cord should not be clamped earlier than 1 min after birth. Delayed cord clamping (performed approximately 1–3 min after birth) is recommended for all births, while initiating simultaneous essential neonatal care. Quality improvement is defined as combined and unceasing efforts of everyone involved in health care including providers, patients and their families, researchers, planners and administrators to make changes that will lead to better patient outcomes, better health system performance and better professional development.

Aims & objectives: To improve rate of delayed cord clamping in term normal vaginally delivered babies by quality improvement methods. To study baseline prevalence of delayed cord clamping in term Normal vaginally delivered babies. To develop a SMART aim for quality improvement which will be specific, measurable, achievable, relevant and timely.

Materials & methods: A one year hospital based quality improvement project was carried out in the department of Pediatrics Bebe Nanki Mother and Child Care Center, Amritsar in collaboration with the department of Obstetrics and Gynaecology both affiliated with Government Medical College and Hospital, Amritsar. All neonates delivered by normal vaginal delivery with a gestation of ≥ 37 weeks were enrolled for study. The babies who required resuscitation at birth and those delivered preterm were excluded from the study. **Results:** We concluded that using quality improvement methods we were able to improve the rate of delayed cord clamping in our institute from compliance rate of 14% to 42%. **Conclusion:** A multidisciplinary team including key leadership from the department of Paediatrics, and obstetrics and Gynaecology allowed for the rapid and safe implementation of delayed cord clamping in term normal vaginal delivery.

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INTRODUCTION

Delayed umbilical cord clamping is a method of facilitating placental transfusion. It is beneficial in neonates as it increases hemoglobin levels at birth and improves iron stores in the first several months of life, having a favorable effect on the developmental outcomes. Delayed umbilical cord clamping is associated with significant neonatal benefits, including improved transitional circulation, better establishment of red blood cell volume, decreased need for blood transfusion and a lower incidence of necrotizing enterocolitis and intraventricular hemorrhage.

WHO recommends that in newborn babies, term or

preterm, who do not require positive-pressure ventilation at birth, the cord should not be clamped earlier than 1 min after birth. When newborn baby, term or preterm, require positive-pressure ventilation, the cord should be clamped and cut to allow effective resuscitation to be performed. Newly born babies who do not breathe spontaneously after thorough drying should be stimulated by rubbing the back 2–3 times before clamping the cord and initiating positive-pressure ventilation. Delayed cord clamping (performed approximately 1–3 min after birth) is recommended for all births, while initiating simultaneous essential neonatal care.

Quality improvement involves the combined efforts of

the health care workers including the providers, researchers, the planners, the administrators, the patient and their families to make changes for better patient outcome health system performance and professional development. It ensures that the health care provided is based on evidence based practices, respects the patients and their preferences without unnecessary delays and is equitable.

Quality improvement also helps to use best clinical and scientific evidence into clinical practice. The key ingredient of quality improvement initiative is the "Change" (Context Specific Improvement) that is proposed and the "Methodology" by which the change is introduced.^{1,2} All these can be accomplished only with good leadership support, staff engagement, motivation and teamwork.

Various Quality improvement tools are:³ Flow charts, Fish bone diagram, Check sheets, Histogram, Pareto chart, Scatter diagram, Control chart.

AIMS AND OBJECTIVES

To improve rate of delayed cord clamping in term normal vaginal delivery babies by quality improvement methods. To study baseline prevalence of delayed cord clamping in term Normal vaginally delivered babies. The current practices of resident doctors and nurses in relation to delayed cord clamping. To develop a SMART aim for quality improvement which will be Specific, Measurable,

Achievable, Relevant and Timely improvement methods.

MATERIAL AND METHODS

A one year hospital based quality improvement project was carried out in the department of Pediatrics Guru Nanak Dev Hospital, Amritsar in collaboration with the department of Obstetrics and Gynaecology both affiliated with Govt. Medical College and Hospital, Amritsar. All neonates delivered by normal vaginal delivery with a gestation of ≥ 37 weeks were enrolled for study.

INCLUSION CRITERIA

1. ≥ 37 weeks gestation.
2. Normal vaginal delivery.

EXCLUSION CRITERIA

1. Birth asphyxia.
2. Prematurity ≤ 37 weeks.

METHOD OF COLLECTION OF DATA

DATA COLLECTION

1. Baseline data collection - the percentage of babies in which DCC was done was collected by the pediatric resident on labor room duty.
2. In the later phases, data collection was done with the help of staff nurses and residents on labour room duty.

RESULTS

TABLE I: SHOWS NUMBER AND PERCENTAGE OF NVD BABIES IN WHICH DCC WAS DONE

Month	DCC done	Early cord clamping done	Percentage of DCC
January – 2022	19	111	14%
February – 2022	17	107	13%
March – 2022	22	79	22%
April – 2022	32	84	27%
May – 2022	46	97	32%
June – 2022	49	99	33%
July – 2022	67	129	34%
August – 2022	78	145	35%
September – 2022	58	100	37%
October – 2022	72	110	39%
November – 2022	70	98	42%

FISH BONE DIAGRAM

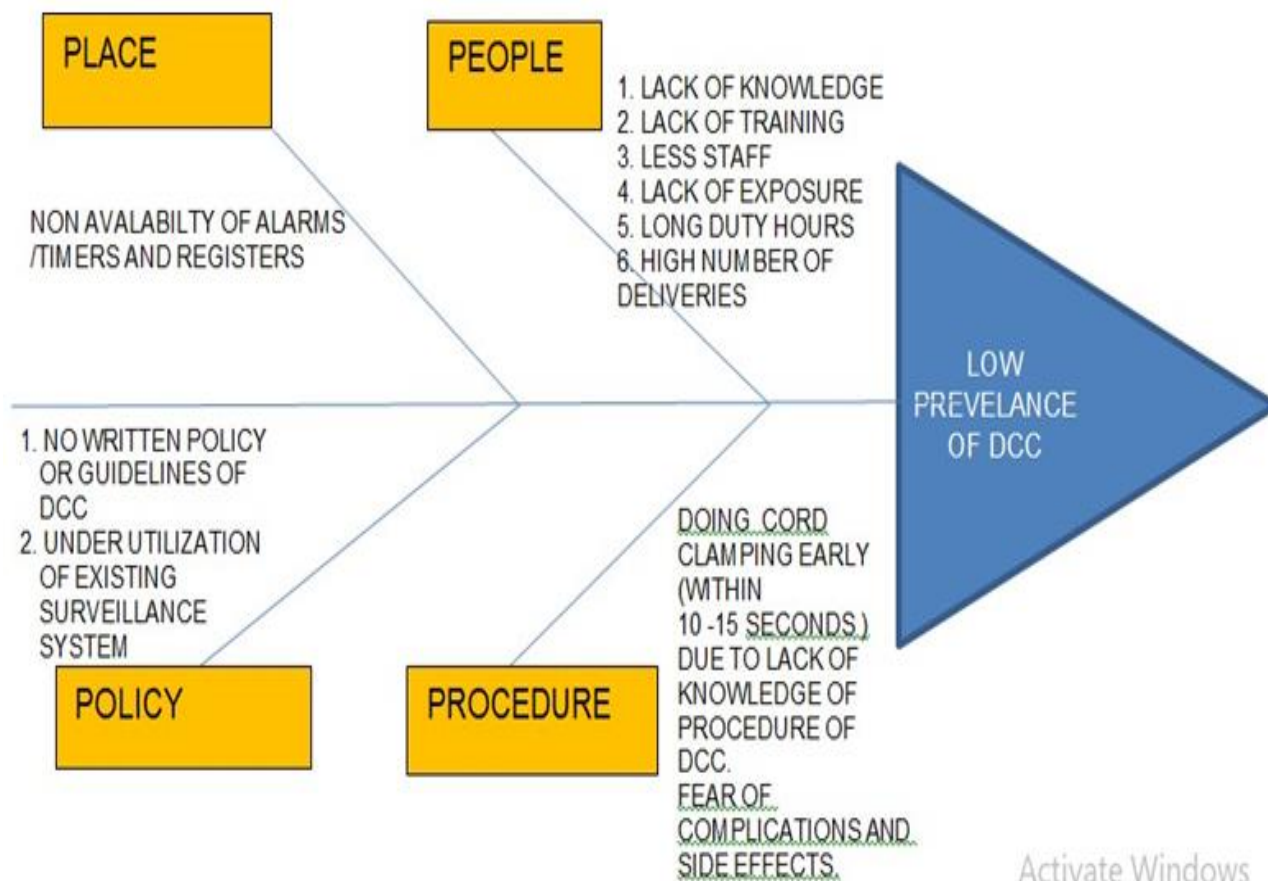
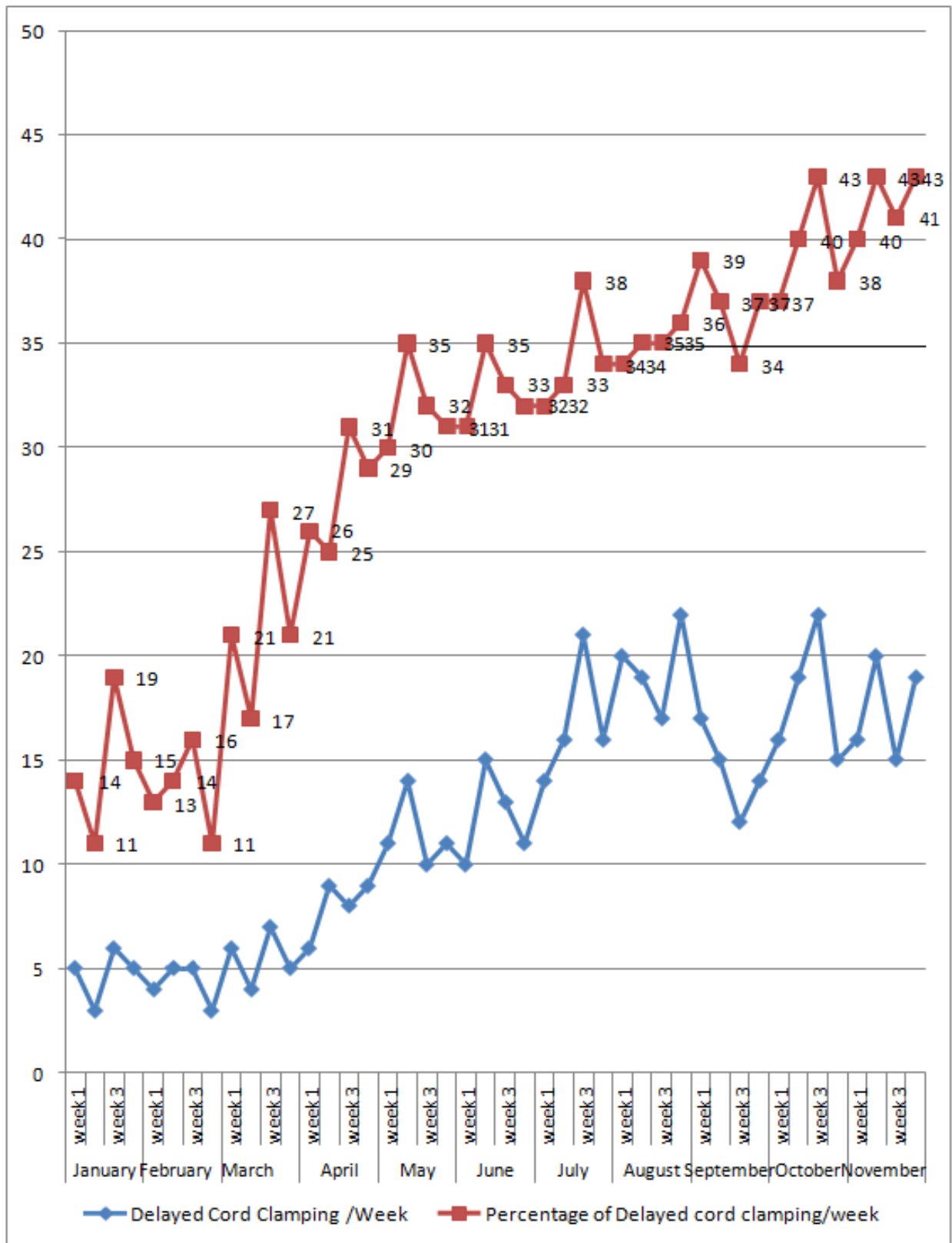


TABLE 2: INTERVENTIONS DONE DURING THE STUDY

Tested changes	Start date	End date	Effective?	Comments
PDSA1 Increasing awareness regarding the procedure technique and its benefits.	1 st March	30 th April	Improvement in rate of DCC from 13% to 27%	Creating awareness regarding the procedure and its importance helped in creating interest among healthcare workers regarding the duration of umbilical cord clamping.
PDSA 2 Assigning specific role to each individual.	1 st May	30 th June	Improvement in rate of DCC from 27% to 33%	Motivation and positive reinforcement among the healthcare workers helped in promoting delayed cord clamping.
PDSA 3 Further improvement in compliance using posters, videos and repeated reminders.	1 st July	31 st August	Improvement in rates of DCC from 33% to 35%	Use of videos and posters for promoting DCC was not much useful in improving the rates of DCC.

GRAPHV: RUN CHART SHOWING THE RATE OF DELAYED CORD CLAMPING /WEEK



CONCLUSION

Delayed cord clamping has many advantages and is recommended by WHO and ACOG but still the compliance rate is low. A Quality improvement team of members was formed

including members from pediatrics as well as obstetrics and gynecology department. This helped in receiving inputs from both departments regarding the strengths and weakness of the existing system and making plans for further improvement.

We made use of quality improvement methods like fish bone diagram and driver diagrams to display our problems as discussed during the focused group discussions.

The compliance of delayed cord clamping improved from 14% to 42% from the month of January 2022 to November 2022 (p value= 0.000 which is highly significant).

The weak points included not able to implement a written policy for DCC in our institute, presence of communication gap between the staff and doctors.

Due to high burden over the residents and staff of the labour room, we could not achieve the target SMART aim, but will continue to implement the quality

improvement methods to improve the rate of DCC as discussed in the future plans.

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