



PHYSIOLOGICAL BASED CORD CLAMPING- AN ARCHAIC STEP RELEARNED CLINICAL STUDY AT A TERTIARY CARE CENTRE.

Obstetrics & Gynaecology

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ABSTRACT

Objective: To study maternal and perinatal outcomes in physiological based cord clamping in third stage of labour. **Method:** We conducted prospective observational study, in the Department of Obstetrics and Gynecology of Govt. Medical college & hospital, Aurangabad for 2 years to study physiological based cord clamping which is a method of deferred cord clamping until natural delivery of placenta. The placenta was allowed to deliver physiologically without any cord traction or cord pull, encouraging mothers own uterine contractions and taking help of gravity. Oxytocin was given intramuscularly to the mother only after complete placental delivery. **Results:** Out of 200 women most of them belong to age group 21-25 years (41.5%) with mean age of 24.78 ± 6.72 years. 47.5% were from upper lower class, 53.5% were G2 followed by 26.5% were primigravida's. About 72% women's GA was ranging between 37-40 weeks. In 89.5% women the time required for 3rd stage of labour ranged between 5-10 minutes while in 99% women's placenta expelled in <15 minutes. In our study 75% of women had outstanding experience after PCC. Among 200 neonates who delivered vaginally, had birth weight 2.5-3 kg (71%). majority of neonates had APGAR score ≥ 7 at 1 min were 97.50%, at 5 minute (100%) and 10 minute (100%) had Apgar score ≥ 7 . It was observed that majority of neonates had heart rate 121-140 bpm at 1 minute (91.5%) and 5 minutes. (96%). Also, it was observed that mean temperature at 5 minutes was 98.32 ± 1.08 F. Only 1.5% required NICU admission for neonatal jaundice. No case of hypothermia seen.

KEYWORDS

GA, PCC.

INTRODUCTION

Physiological based cord clamping is a method of deferred cord clamping until natural delivery of placenta.¹ From the time of the ancient Greeks, midwives have described the value of waiting to clamp the cord until pulsations stop or until the placenta is delivered [1]. Different definitions of ECC have been used, with the time varying from immediately to within one min after delivery of the baby. In modern trials ECC has usually been defined as clamping within 10-30 sec after birth [2] Late or delayed cord clamping is usually defined as cord clamping 2-3 min after delivery, or after cessation of cord pulsations.[3]

The main proposed advantage of PCC is prevention of infant iron deficiency, a condition that is associated with suboptimal neurodevelopment. The rationale for this strategy is that a placental transfusion of 80-100 ml of blood will supply 40 to 50 mg/kg of additional iron to the basal stores of 75 mg/kg of body iron in a newborn term infant. Delayed cord clamping is associated with higher hemoglobin (Hb) in the neonatal period and at 2 months of age, and with significantly higher iron stores at 6 months of age. [3]

Infants born apneic and hypoxic have their cords immediately clamped, are likely to have a restricted cardiac output combined with hypoxia. Cord milking before clamping improves the pulmonary blood flow immediately at birth and assists lung expansion at the onset of respirations. [4,5]

World Health Organization (WHO) reiterated recommendation of ACOG and AAP to delay cord clamping for 1-3 min while initiating simultaneous essential newborn care. [6]

We are providing respectful maternity and newborn care to all pregnant women at our institute under LAQSHYA guidelines and as a part of it we want to give a positive birthing experience by doing PCC and early skin to skin contact and immediate breastfeeding. So, we have planned to study physiological based cord clamping in our tertiary care Centre.

MATERIAL AND METHODOLOGY

This study was a prospective observational study done in the Department of Obstetrics and Gynaecology, Government Medical College & hospital Aurangabad, Maharashtra. It has delivery rate of about 19,000 deliveries per year. After obtaining the permission from

the institution ethics committee, applying inclusion criteria and after obtaining written consent from patient prospective data of all women who delivered from 2020 to 2022 in the department was obtained. After approval from the Institutional Ethics Committee, prospective data of all women in the department was obtained. Data analyzed including age, parity, onset of labour, delivery details and neonatal details with objectives

- To study clinical profile of maternal and perinatal outcomes in physiological based cord clamping in tertiary care center.
- To study the effect of physiological based cord clamping on third stage of labor.

Total 200 women were selected, who met the designed set of criteria. Informed written consent was taken from patients and their families.

The Inclusion criteria- All term low risk pregnant women with singleton cephalic pregnancy.

Exclusion criteria: Women with maternal risk factors like: High risk pregnant women, Preterm and non-cephalic presentation were excluded. Also, Fetus with fetal distress, IUGR & congenital anomalies were not included in study.

Upon delivery, the new-born was received by nurse/doctor within a warm sterile towel to, assessed and dried. Time of delivery noted with the help of a stopwatch. APGAR score was recorded. Early initiation of breastfeeding done with the umbilical cord is still intact.

Current NRP guidelines used for resuscitation of child. The placenta was allowed to deliver physiologically without any cord traction or cord pull, encouraging mothers own uterine contractions and taking help of gravity. Oxytocin was given intramuscularly to the mother only after complete placental delivery.

Maternal outcome was noted in the form of cord avulsion, retained placenta, atonic postpartum haemorrhage, requirement of blood transfusion was based on visual estimation of blood loss (EBL) and clinical parameters. Mothers experience measured by satisfaction scale.

Early perinatal outcome was noted by Fetal HR & oxygen saturation at 1, 5 and 10 minutes, need neonatal resuscitation, need for NICU admission, neonatal hypothermia neonatal complications like

hyperbilirubinemia requiring phototherapy and or exchange transfusion, neonatal polycythemia, IVH, enterocolitis.

RESULTS

A total 200 women in the study period were analysed. It was observed that 41.50% ie 83 were in the age group of >20-25 and mean age was found to be 24.78 ± 6.72 .

135 (67.50%) were from rural place and most were studied up to secondary level (50.50%).

Maximum number of mothers 107 (53.5%) were G2 followed by G1 among 53 (26.50%). Most common gestational age was 37-40 weeks (72%) followed by 40-41 weeks of gestational age (28%).

Majority of women with vaginal delivery delivered spontaneously (80.50%) and 19.5% were induced delivery. 89.5% of women required 5-10 min for 3rd stage of labor and 198 (99%) women required <15 min for expulsion of placenta, only 2(1%) women required CCT. In (99%) of patient placenta delivered spontaneously out of which 11.5 % women adopted upright position like squatting for placental delivery and 1 % required delivery of placenta by controlled cord traction. 199 (99.5%) had up to 500 ml blood loss which is normal for vaginal delivery by visual estimation. One women had > 500ml-1000ml blood loss was a case of multigravida which was managed with additional oxytocics like inj. Oxytocin, inj. Carbetocin inj. Methylergometrine, inj. tranexamic acid, tab Misoprostol etc.

Women required blood transfusion were diagnosed with anaemia in intrapartum period.

In 75% women reported having a outstanding experience with physiological cord clamping and 20% gave very satisfactory experience and 5% women gave satisfactory response.

Among the babies born most had birth weight 2.5-3 kg (71%). majority of neonates had APGAR score ≥ 7 at 1 min were 97.50%, at 5 minute (100%) and 10 minute (100%) had Apgar score ≥ 7 . It was observed that majority of neonates had heart rate 121-140 bpm at 1 minute (91.5%) and 5 minutes. (96%). Also, it was observed that mean temperature at 5 minutes was 98.32 ± 1.08 F.

Among 200 neonates delivered vaginally, only 3 (1.5%) neonates required NICU admission. All 3 neonates had jaundice (48 hours after delivery) which developed in the postnatal period.

Table.1: Baseline characteristics (n=200)

S.N.	Age group (years)	Frequency	Percentage
1	18-20	40	20.00
2	20-25	83	41.50
3	25-30	67	33.50
4	> 30	10	05.00
Gravida			
1	G1	53	26.50
2	G2	107	53.50
3	$\geq$ G3	40	20.00
Gestational Age			
1	37-40	144	72.00
2	>40-41	56	28.00
Type of delivery			
1	Spontaneous	161	80.50
2	Induced	39	19.50

Table.2: Durum of 3rd stage of labour and placental delivery (n=200)

S.N.	Time req. in 3rd stage	Frequency	Percentage
1	5-10 min.	189	89.50
2	>10-15 min.	19	09.50
3	>15 min.	02	01.00
Time required for expulsion of placenta (Min.)			
1	< 15	198	99.00
2	$\geq$ 15	02	01.00
Estimated Blood loss in 3rd stage of labour			
1	$\leq$ 500 ml	199	99.50
2	> 500-1000 ml	01	00.50

Table. 3: Maternal Outcome (n=200)

S.N.	Mode of delivery of placenta	Frequency	Percentage
1	Spontaneous	198	99.00
2	CCT	02	01.00
Outcome of vaginal delivery			
1	Uneventful	199	99.50
2	Mild PPH	01	00.50
Women's Experience			
1	Outstanding	150	75
2	Very Satisfactory	40	20
3	Satisfactory	10	05
4	Unsatisfactory	00	00
5	Poor	00	00

Table. 4: Neonatal Outcome (n=200)

S.N.	Birth weight (Kg)	Freq.	%
1	2.5-3	142	71.00
2	3-3.5	42	21.00
3	> 3.5	16	08.00
APGAR score (min.)			
At 1 min.	< 7	05	02.50
	$\geq$ 7	195	97.50
At 5 min.	< 7	00	00
	$\geq$ 7	200	100
At 7 min.	< 7	00	00
	$\geq$ 7	200	100
Neonatal oxygen saturation			
At 1 min.	< 93 %	12	06.00
	94-96 %	180	90.00
	97-99 %	08	04.00
At 5 min.	< 93 %	08	04.00
	94-96 %	186	93.00
	97-99 %	06	03.00
At 7 min.	< 93 %	03	01.50
	94-96 %	186	93.00
	97-99 %	11	05.50
Heart Rate			
At 1 min.	100-120 bpm	19	09.50
	121-140 bpm	181	91.50
At 5 min.	100-120 bpm	08	04.00
	121-140 bpm	192	96.00
NICU admission			
1	Yes	03	01.50
2	No	197	98.50
Cause of NICU admission			
1	Neonatal Jaundice	03	01.50
2	Hypothermia	00	00

DISCUSSION

Recent recommendations by WHO included physiological cord clamping to manage the third stage of labor and promote various maternal and neonatal benefits. [4]

In present study the mean age of the women was 24.78 ± 6.72 years. Similarly, D. Kalarani et al. [8], Nikita V. Gonnade et al. [9] and Catalina De Paco et al. [10] reported mean age of 27.2 ± 2.8 , 23.58 and 30.18 ± 5.7 years respectively. This difference may be due to different study population.

In the present study, it was observed that women were gravida 2 (53.5%) followed by primigravida (26.5%) D Kalarani et al. [8] in a study on to examine the characteristics of prolonged cord clamping on maternal- and neonatal-effect observed 55% of the respondents were primigravida and 45 % of respondents were multigravida.

The mean GA in present study was 38.43 wks. Which was comparable to study done by D. Kalarani et.al. [8] which examined the characteristics of prolonged cord clamping on maternal- and neonatal-effect observed had a mean gestational age of 38.61 ± 0.7 weeks.

It was observed that the effects of physiological cord clamping on the third stage of labor observed mean duration of the third stage of labor was 9.0 ± 5.1 min which is comparable to other studies like Catalina De Paco et al. [10] and H Wu et al. [11].

It was observed that women required <15 min for expulsion of placenta (99.0%) followed by ≥15 minutes (1.0%) which is comparable to other study like Hang-Lin Wu et al. [10]. One multigravida female required more than 15 min were given oxytocic's and with help of controlled cord traction placenta delivered, there was no evidence of bleeding PV and did not need manual removal of placenta. It was observed that majority of women had uneventful outcome (99.50%) severe PPH was not observed. It was observed that 75% women reported having an outstanding experience and 20% with very satisfactory experience and 5% were satisfied with physiological cord clamping. Similarly, Nikita V. G et al. [9] and Mohammad et al. [12] observed maximum uneventful outcome in their studies.

It was observed that majority of neonates had birth weight 2.5-3 kg (71%) followed by 3-3.5 kg. (21%). Present study on examining the characteristics of prolonged cord clamping on maternal- and neonatal-effect observed the majority of the newborns were all in the 2500-3000 gram grouping with mean weighed 2658 grams which is comparable to other studies like D Kalarani et al. [8], Nikita V. Gonnade et al. [9], Catalina De Paco et al. [10].

In present study among 200 neonates delivered vaginally, only 3 (1.5%) neonates required NICU admission. It was observed that among 3 neonates who required NICU admission, all had neonatal jaundice which developed 48 hours after delivery. No case of hypothermia seen. Ola Andersson et al. [13] in a study observed in the intact cord group, 16 (11.9%) newborns were transferred to the neonatal intensive care unit.

CONCLUSION

Our study included application of Physiological based cord clamping in term low risk pregnancies in 200 cases where we conclude that in majority of pregnant mothers there was no prolongation of third stage of labor and no evidence of retained placenta seen. 99% of pregnant female had no complication of postpartum hemorrhage. Women's experience after PCC was outstanding experience and they felt a sense of wellbeing due to minimal vaginal examination.

In early neonatal outcome all newborns were having good APGAR score with no hypothermia due to immediate skin to skin contact and early initiation of breast feeding and no immediate NICU admission which points out that there is smoother cardiopulmonary transition birth after PCC. We recommend practicing PCC under low resource setting where institution delivery is not possible which might offer a sustainable strategy to prevent TTN, hypothermia and can be practiced for prevention of anaemia. At the same time, it provides positive birthing experience to the mother. Respectful maternity and newborn care are the right of every birthing woman and newborn. Therefore, PCC should be the norm rather than an exception in term uncomplicated deliveries.

Limitation of Study

In study immediate benefits of PCC were assessed. Anemia in infants required follow up of 1 year.

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