

Study of Weight Patterns in Exclusively Breast Fed Neonates- Does the Route of Delivery have an Impact?

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ABSTRACT

Introduction: Physiological weight loss is seen in all breast fed neonates. The route of delivery may have an effect on the neonatal weight loss/gain in these exclusively breast fed babies. Additional assistance and support for exclusive breast feeding is needed by mothers who undergo cesarean section.

Aim: To study and compare the weight patterns in full term exclusively breast fed neonates born by normal vaginal route versus cesarean section in the first month of life.

Materials and Methods: It is a prospective observational study. Healthy, full term neonates born by normal vaginal route or cesarean section in a rural tertiary hospital with uneventful perinatal periods were included. Exclusive breast feeding was given to all neonates with supervision and encouragement to the mothers.

Primary outcome measure- Weight loss of the neonates at 24 hours and 72 hours of life.

Results: Neonates delivered by cesarean section showed a higher weight loss (% of birth weight) at 24 hours {mean(sd)} than those delivered vaginally {3.2 (1.9) vs 2.2 (1.2); p-value=0.0016}. At 72 hours, the cesarean neonates had higher weight loss than vaginally delivered neonates {5.9 (3.1) vs 4.7 (2.5); p-value=0.0314}. At 28 days of life, the neonates born by cesarean section showed lower weight gain than those delivered by vaginal route {10.9 (2.1) vs 11.9 (2.3); p-value=0.0244}.

Conclusion: The route of delivery has a significant impact on the physiological weight loss seen in exclusively breast fed neonates. Babies delivered by cesarean section showed significantly higher weight loss in the first week of life, and lower weight gain at the end of first month than babies born by vaginal route.

Keywords: Breast feeding, Cesarean section, Newborns, Weight loss

INTRODUCTION

The first week of postnatal life is characterized typically by weight loss in neonates. Full term neonates may lose 5-10% of body weight and preterms up to 15% of body weight by 4-6 days. This occurs mostly due to loss of extra cellular fluid [1]. Neonates may have an increase in serum sodium and a decrease in weight in the first few days of life given the low volume of breast milk that is initially provided. When there is increased production of copious mature milk, the neonates begin to gain weight and the serum sodium levels fall. Babies who are breast fed will regain their birth weight on an average, by 8.3 days [2]. Insufficient milk intake, jaundice, dehydration and weight loss > 7% may be seen after 48 hours of life. Insufficient breast milk intake may be due to low milk production or failure to establish breast feeding [3].

Excessive weight loss may be seen in breast fed infants (>7% of their birth weight) in the first 48 hours of life [4]. Breast fed infants showed a greater weight loss than formula fed infants, while the latter regained birth weight earlier than the former [5]. Breast feeding must be initiated for all newborns including those delivered by Cesarean section, as soon as possible after birth. All mothers, especially first time mothers should receive support for breast feeding from health care personnel. Mothers who undergo operative birth may need additional motivation and support for initiation of breast feeding in the first hour [6]. A few studies have shown that Cesarean Delivery was a consistent risk factor for non initiation of breast feeding in the first hour of life [7,8]; and Cesarean section was negatively associated with breast feeding initiation [9]. Some studies point that the type of delivery strongly influences the weight gain pattern in the neonatal period, with babies delivered by cesarean section showing greater weight loss than those delivered by normal vaginal

route [10]. There are very few studies from our country that explore the relationship between the mode of delivery and the pattern of neonatal weight gain, to the best of our knowledge. Hence, this study was conducted to explore the impact of route of delivery on the weight patterns in exclusively breast fed neonates in the first month of life. We also compared the weights in babies delivered by vaginal delivery and caesarian section at the end of first month of life.

MATERIALS AND METHODS

This is a prospective observational study conducted in MVJ Medical College and Research Hospital, Hoskote, Bangalore over a period of three months from August to October 2012. One hundred and twenty mothers and their healthy full term singleton neonates with uneventful perinatal periods were included in the study. All the babies were roomed in with their mothers and given exclusive breast feeding which was initiated within the first hour of birth, as per BFHI (Baby friendly Hospital initiative) policy. All the mothers received support, encouragement and supervision for breast feeding techniques and good latching. Of the 120 mother baby dyads at the start of the study, 9 dyads missed the follow up weight checks at day 7 and/or day 28; in 7 neonates exclusive breast feeding was not followed after discharge from the hospital. Hence these 16 dyads were excluded from the study and a total of 104 dyads were analysed. There were 55 neonates delivered by normal vaginal route and 49 neonates delivered by cesarean section. The weights of these babies were recorded on day 1 and day 3 (72 hours) during their hospital stay, and on day 7 and day 28 during follow up. The neonates were weighed naked using electronic baby weighing scale (Phoenix model BWS101) with resolution of 1 gram. Clinical and demographic data of the mothers and neonates in the study were recorded and

analysed. Primary outcome measured was weight loss of neonates in the two groups (% of birth weight) at 24 hours and 72 hours of life. Secondary outcome was weight gain (g/kg/day) at 28 days of life.

STATISTICAL ANALYSIS

Unpaired t-test was used for analysis of continuous variables including the baseline characteristics of the mother baby dyads. SPSS version 21 was used for statistical analysis.

RESULTS

Of the 104 mother baby dyads in the study, there were 51 male and 53 female neonates. Fifty five babies were delivered by normal vaginal delivery (NVD) and 49 were delivered by Cesarean section (CS). The demographic data of the mothers including the socioeconomic status and education are given in [Table/Fig-1]. The clinical characteristics of the neonates in the normal vaginal delivery and Cesarean section groups are also given in [Table/Fig-1].

The weight loss (% of birth weight) on day 1 (24 hours) and day 3(72 hours) are shown in [Table/Fig-2]. Babies delivered by CS showed a greater weight loss of 3.2% than the weight loss of 2.2% in NVD babies at 24 hours; The p-value was significant (0.0016). The corresponding weight loss at 72 hours in the CS and NVD groups were 5.9% and 4.7% respectively; the p-value was significant (0.0314).

[Table/Fig-3] shows the weight patterns in the first month of life in the two groups in g/kg/day. The weight loss on days 1, 3 and 7 were higher in the CS group than the NVD group and this was found to be statistically significant on all the three occasions with p-value

Variables	NVD (n=55)	CS (n=49)	p-value
Age, mean (sd)	24.74 (4.01)	23.59(2.57)	0.098
Primipara (total 26), n (%)	12(22)	14(29)	0.42
Multipara (total 78), n (%)	43(78)	35(71)	0.427
SE status			
Class 1 n (%)	15(27)	15(31)	0.707
Class 2 n (%)	28(51)	22(45)	0.54
Class 3 n (%)	10(18)	11(22)	0.58
Class 4 n (%)	2(4%)	1(2%)	0.62
Education			
Below sslc n (%)	10(18)	5(10)	0.248
Sslc n (%)	7(12)	10(20)	0.29
PUC n (%)	8(15)	4(8)	0.309
Grad n (%)	22(40)	22(45)	0.614
PG n (%)	8(15)	8(17)	0.802
Birth wt (g), mean(sd)	2901.91(436.61)	3015.20(362.74)	0.149
GA, mean (sd)	38.38(0.49)	38.37(0.71)	0.933
Males (total 51), n (%)	28(51)	23(47)	0.686
Females (total 53), n (%)	27(49)	26(53)	0.68

[Table/Fig-1]: Clinical and demographic data of mothers and neonates in the study

Weight loss	NVD (n=55)	CS (n=49)	p-value
Day 1, mean (sd)	2.2(1.2)	3.2(1.9)	0.0016
Day 3, mean (sd)	4.7(2.5)	5.9(3.1)	0.0314

[Table/Fig-2]: Weight loss in the two groups (% of birth weight)

Weight loss	NVD (n=55)	CS (n=49)	p-value
Day 1 mean (sd)	21.3(8.8)	32.6(20.0)	0.0001
Day 3, mean (sd)	15.7(8.4)	21.1(14.4)	0.0198
Day 7, mean (sd)	2.2(1.8)	2.9(1.6)	0.0396
Day 28, mean (sd) *gain	11.9(2.3)	10.9(2.1)	0.0244

[Table/Fig-3]: Weight patterns in the two groups in the first month of life (g/kg/day)
*weight gain (g/kg/day)

<0.05. On day 28, the infants of the NVD group showed a slightly higher weight gain (11.9g/kg/d) than the CS group (10.9g/kg/d) with a significant p-value of 0.02.

DISCUSSION

The important finding of this study is the significant association between weight loss and the mode of delivery. The neonates delivered by cesarean section showed greater weight loss than those delivered by normal vaginal route (3.2% vs 2.2% and 5.9% vs 4.7% respectively) at 24 and 72 hours of life. Saki A et al., studied the effect of type of delivery on exclusively breast fed neonates who were exclusively breast fed in Shiraz, Iran. They also reported that neonates born by Cesarean section showed greater weight loss at birth and first few days of life (p-value <0.01) [10].

Mulder PJ et al., found that during postpartum hospitalization, breast fed infants showed excess weight loss (>7%) in the first two days post partum in the absence of other indicators of ineffective breast feeding [4]. Noel-Weiss J et al., in their systematic review of five electronic databases reported that mean weight loss ranged from 5.7% to 6.6% [11]. Bertini G et al., reported a mean weight loss of 5.95% in a study of full term vaginally delivered babies [12]. In the present study we found that the mean weight loss on day 3 was 4.7%. The importance of postnatal lactational counseling leading to higher weight gain in the neonatal period has been highlighted in their study by Pereira et al. They also found reduced frequency of mixed feeding among mothers who received lactational counseling [13].

There has been a worldwide rise in Cesarean section rate in the last 30 years with Caesarian section being the most common major surgery in private health sector. The rise has been seen in Indian setting and in rural areas as well [14-16]. Cesarean delivery has been reported as a barrier for initiation of breast feeding in the first hour of life. Additional intervention programs and special assistance to support breast feeding have been recommended for mothers undergoing Cesarean section [7- 9]. Perez- Escamilla R et al., also reported that Cesarean section was also a risk factor for breast feeding for less than one month [8]. In our study, we found that on day 28, the NVD infants showed a higher weight gain (11.9 g/kg/d) than the CS infants (10.9g/kg/d), with a significant p-value of 0.024. However, Saki A et al., reported that neonates born by Cesarean were below that of normal vaginal deliveries till 25 days postpartum, after which Cesarean deliveries showed higher weight gain than normal vaginal deliveries [10].

CONCLUSION

The route of delivery (Cesarean section or normal vaginal route) has a significant impact on the physiological weight loss experienced by exclusively breast fed neonates in the first week of life. Neonates delivered by caesarian section showed significantly higher weight loss on days 1 and 3 of life. They also showed lower weight gain than those born by vaginal route at the end of first month of life. Mothers who undergo Cesarean section need greater support and assistance for breast feeding.

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