Early Weight loss in Cesarian Section, Healthy Exclusively Breast-fed Neonates

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Abstract

Background: The early detection of breast feeding malnutrition is of clinical importance and has been poorly studied. Normal or abnormal weight loss in healthy exclusively breast-fed neonates during the first 48 hours of life has not been clearly defined.

Objective: To determine weight loss in cesarian section, healthy exclusively breast-fed neonates (n=150) during their first 2 days of life.

Methods and Subjects: A prospective and descriptive study have been conducted at Arya General Hospital in Tehran from May 8, 2002 to October 30, 2002. A total of 160 newborns born by cesarian section were included. The weight of the newborns were measured at birth, 12, 24 and 48 hours after delivery by digital scale and all healthy newborns fed exclusively breast milk.

Results: The mean body weight at birth were 3080 grams (95% confidence interval [CI] 2629.5 – 3505.5), after 48 hours 2841 grams (95% CI 2423.28, 3250.23), total body weight loss ranging from 184 to 335 grams or 8.6% and 3270 grams, (95% CI 2885.32-3655.94), after 48 hours 3023 grams (95% CI 2643.6,3402.6), total body weight loss ranging 170 to 275 grams or 7.5% in female and male neonates respectively.

Conclusion: This study confirm approximately 8% weight loss in healthy cesarian section with exclusively breast-fed neonates during the first 48 hours of life. Therefore, for the protection of early weight loss we should reduce adverse factors such as cesarian section and the mothers be completely trained and encouraged for nursing before delivery.

Key words: newborn, weight loss, cesarian section, dehydration, breast-fed.

Introduction

The baby-friendly Hospital initiative was launched by the world-health organization and UNICEF to promote and support breast-feeding in maternity services and hospitals, within the framework of national action. The goal to be achieve is the all women should be enabled to practice exclusive breast feeding from birth. It is generally accepted that human milk is the ideal food for full-term and premature infants. The advantages of breast milk over commercial formulas include lower morbidity from infectious disease, the increase bioavailability of certain nutrients, the convenience of a readily available source and low cost, reduction of the occurrence of allergic disease and promotes psychologic bonding between mother and infant. On the other hand, we know, complications related-
breast feeding like dehydration because of inadequate milk, increase neonatal morbidity because of early postpartum hospital discharge, risk of hyperbilirubinemia, elevations of temperature on the second and third days of life, and neonatal hypernatremic dehydration.

**Subjects and Methods**

A descriptive and prospective study were conducted with the objective of determination of newborns' weight at birth, 12-24 and 48 hours after delivery in exclusively healthy breast-fed infants at Aria General Private Practice Hospital that is one of the Baby-friendly hospital. This hospital contains an obstetric unit with 400-600 births per year. In Tehran-Iran, majority of pregnant women prefer to be delivered by cesarian section in private practice hospital and are not trained for nursing. All singleton healthy neonates born by cesarian section from May 8, 2002 to Oct. 30, 2002 with various birth weights and gestational age with normal clinical and neurological examination and that an uneventful neonatal period until discharge on day 2 were included. All women were mixed – class, white and surgical procedure were done by general anesthesia. The obstetricians administered narcotic and analgesic agents to women for relief of post surgical pain.

Newborns were excluded if birth indicated any of the following: (1) normal vaginal delivery, because of early discharge and unavailable to them; (2) congenital anomalies; (3) abnormal post partum conditions (including asphyxia, seizures, respiratory illness); (4) medical complications for this pregnancy (e.g., preexisting or pregnancy-related diabetes or hypertension, eclampsia, cardiovascular disease); (5) complications of labor or delivery (including fever, rupture of membranes 24 hours prior to delivery); (6) poor general condition; (7) suspected sepsis or any infant needs intravenous fluid or oxygen therapy.

After birth, the newborns were observed in nursery room for 1 to 2 hours for physical examination and stabilization then they transferred to mother's room for breast feeding. The nursing staff frequently helped, trained and encouraged the mothers for breastfeeding according to previous training by Iranian members of baby-friendly-hospital or breastfeeding committee. The author completely checked all duties of nursing staff for performing of orders of Iranian breastfeeding committee. We did not interfere in clothes of neonates and it was according to family customs (cotton hat, sleeping suit, and relative thick blanket and short stocking). The room temperature was about 23 to 24 centigrade degree. The main criteria in evaluation was neonatal weight not otherwise. All mothers and infants were residing in the hospital under similar conditions. All the infants were with their mothers for day and night except for cleaning or bathing (rooming in). At each visit, complete physical examination was performed by author and abnormal physical findings and weight of neonates were recorded on progressive sheet. Measurement of the naked infant's weight were taken at each visit by nursing staff who routinely performed these duties by a digital scale and recorded to the nearest 0.01 Kg as part of the study design, weight of infants were calculated in gram per time at each weighing. The neonates were divided in groups of 300 grams according to birth weight and thereafter for determination of distribution of birth weight and weight of future hours in female and male infants.

Comparisons were tested by the student's t-test. 95% confidence interval were calculated by Rothman's method.

**Results**

Out of 244 newborns, a total of 160 neonates have been born by cesarian section in this setting during period of study were selected for weight monitoring. Of them 96 (60%) were primiparous and 64 (40%) multiparous. From 160 infants were included in this study 80 (50%) infants were females and 80(50%) were males (accidentally are equal). Birth weight of neonates ranging from 1800 to 3900 grams (mean±SD 3080±438 grams, 95% confidence interval [CI] 2629.5-3505.5) and 2400 to 4100 grams (mean±SD 3270.03±385.319, 95% CI 2885.32-3655.94) in female and male infants respectively. Among the newborns selected for daily weight monitoring, maximum number of neonates in both gender were in the group of 3001-3300 grams, The weight loss of infants ranges from 184-335 grams and 170 to 275 grams in female and male neonates respectively. The distribution of mean birth weight and weight loss of neonates during study were shown in table 1 and 2 separately for two genders. Total of mean, SD and 95% confidence interval of birth weight, 12, 24, and 48 hours after birth were shown in table-3. There were no significant
### Table 1: Distribution of Birth Weight, Weight Loss in Female Newborns During 48 Hours

<table>
<thead>
<tr>
<th>Birth weight groups</th>
<th>No. of newborns</th>
<th>Birth weight mean±SD</th>
<th>12 mean±SD (%)</th>
<th>24 mean±SD (%)</th>
<th>48 mean±SD (%)</th>
<th>Total Grams (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800-2100</td>
<td>2</td>
<td>1990±212.13</td>
<td>1800±41.42</td>
<td>1750±141.42</td>
<td>1700±141.42</td>
<td>200 (15.5)</td>
</tr>
<tr>
<td>2101-2400</td>
<td>3</td>
<td>2267±115.47</td>
<td>2184±104.08</td>
<td>2134±104.08</td>
<td>2084±104.08</td>
<td>218 (8.3)</td>
</tr>
<tr>
<td>2401-2700</td>
<td>13</td>
<td>2619±77.83</td>
<td>2519±66.66</td>
<td>2488±82</td>
<td>2373±66.5</td>
<td>246 (6.7)</td>
</tr>
<tr>
<td>2701-3000</td>
<td>19</td>
<td>2887±86.35</td>
<td>2818±78.55</td>
<td>2762±88.77</td>
<td>2668±109.56</td>
<td>219 (7.8)</td>
</tr>
<tr>
<td>3001-3300</td>
<td>20</td>
<td>3188±94.42</td>
<td>3075±88.11</td>
<td>3013±76.26</td>
<td>2947±75.18</td>
<td>240 (7.7)</td>
</tr>
<tr>
<td>3301-3600</td>
<td>13</td>
<td>3438±95.4</td>
<td>3334±110.7</td>
<td>3262±108.75</td>
<td>3208±70.26</td>
<td>250 (7.4)</td>
</tr>
<tr>
<td>3601-3900</td>
<td>10</td>
<td>3810±119.7</td>
<td>3720±125.17</td>
<td>3645±134.27</td>
<td>3475±151.38</td>
<td>335 (9.1)</td>
</tr>
</tbody>
</table>

SD = Standard Deviation

### Table 2: Distribution of Birth Weight, Weight Loss in Male Newborns During 48 Hours

<table>
<thead>
<tr>
<th>Birth weight groups</th>
<th>No. of newborns</th>
<th>Birth weight mean±SD</th>
<th>12 mean±SD (%)</th>
<th>24 mean±SD (%)</th>
<th>48 mean±SD (%)</th>
<th>Total Grams (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2400-2700</td>
<td>7</td>
<td>2621±107.46</td>
<td>2529±172.86</td>
<td>2464±133.5</td>
<td>2393±109.65</td>
<td>170 (9)</td>
</tr>
<tr>
<td>2701-3000</td>
<td>14</td>
<td>2871±99.45</td>
<td>2721±120.44</td>
<td>2675±96</td>
<td>2636±96.93</td>
<td>233 (8.1)</td>
</tr>
<tr>
<td>3001-3300</td>
<td>26</td>
<td>3198±79.35</td>
<td>3127±82.74</td>
<td>3040±86</td>
<td>2954±74.73</td>
<td>244 (7.8)</td>
</tr>
<tr>
<td>3301-3600</td>
<td>20</td>
<td>3478±95.25</td>
<td>3403±100.64</td>
<td>3288±102.41</td>
<td>3208±125.94</td>
<td>228 (8)</td>
</tr>
<tr>
<td>3601-3900</td>
<td>9</td>
<td>3800±93.54</td>
<td>3722±106.4</td>
<td>3617±90.14</td>
<td>3208±83.94</td>
<td>228 (6)</td>
</tr>
<tr>
<td>3901-4200</td>
<td>4</td>
<td>4050±40.82</td>
<td>392±50</td>
<td>3888±85.39</td>
<td>3775±95.74</td>
<td>275 (6.9)</td>
</tr>
</tbody>
</table>

### Table 3: Total Weight Changes During 48 Hours

<table>
<thead>
<tr>
<th>Birth Weight mean±SD (CI)</th>
<th>12 mean±SD (CI)</th>
<th>24 mean±SD (CI)</th>
<th>48 mean±SD (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>308±438</td>
<td>2990±442.81</td>
<td>2918±431.26</td>
<td>2833.25±408.98</td>
</tr>
<tr>
<td>(2629.55,3505.5)</td>
<td>(2547.83,3433.44)</td>
<td>(2488.74,3351.26)</td>
<td>(2423.27,3250.23)</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3270±385.31</td>
<td>3196±381.65</td>
<td>3103.13±361.90</td>
<td>3023±379.5</td>
</tr>
<tr>
<td>(2885.32,3655.94)</td>
<td>(2815.23,3578.53)</td>
<td>(2741.23,3465.03)</td>
<td>(2643.6,3402.6)</td>
</tr>
</tbody>
</table>

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difference in birth weight and weight loss of neonates between the primiparous and multiparous mothers. Two females neonates with weight of less than 2000 grams were low birth weight.

Discussion
Present study shows progressive weight loss during 48 hours postpartum in infants who are healthy and exclusively breast fed. The infant’s physiologic body weight reduction is mainly related to a reduction in the extracellular fluid compartment as a result of losses from skin, lungs, intestine, and kidneys and is not compensated, because colostrums volume is very low in the first few days after birth because of maternal steroid hormone levels probably inhibit milk production13 and lactation is not fully established. Soskolne et al performed a retrospective study among infant within the first 3 weeks of life documented that ninety-four percent of infants readmitted for dehydration or jaundice were breast fed, compared with 67% of newborns without either diagnosis12. Sporadic cases of hypernatremic dehydration in breast-fed newborns have appeared in the medical literature for at least three decades3,8,9. Giovanna Marchini and solving stock’s findings indicate that the major reduction in body weight occurs during the first 1 to 2 days after birth and if the serum sodium level and osmolality measured as early as 16 hours after birth most probably already reflect a state of increased toxicity. Thus the plasma level of vasopressin during the first two days after birth may already be elevated as the result of this postnatal increase in serum sodium concentration and osmolality10. These infants who lost more than 10% of body weight had a hormones that was in the same range as that observed in adults after fluids restriction11. This result indicates that the newborn infant is able to release vasopressin in response to serum hypertonicity and is in agreement with the increase urinary vasopressin activity previously reported in infants younger than three days old, after 8 hours of thirst12, and with the reduced rate of urinary output during the first days after birth31.

Mean birth weight of present study is 3080 to 3270 grams in female and male neonates respectively, whereas in comparison with various workers from different parts of India is 2470 to 3060 grams,29,35.
As per WHO expert committee on infant feeding and growth, postnatal loss upto 4.8% of birth weight is observed. This is a result of fall of intracellular fluid after birth, particularly from skin and is influenced by feeding practices, ambient temperature and to some degree loss of meconium36. There is shift of fluid from intracellular to extracellular compartment that stabilizes after three days. Ghai et al observed initial loss of weight upto 10% of body weight37 whereas in comparison with the present study the mean body weight loss is 8%.

The comparison of mean birth weight in females are less than males and weight loss in females is more than male neonates.

The weight loss in two gender is variable and does not related to birth weight, sex and postnatal ages.

In the present study, it seems that early weight loss in the newborns that is abnormal may be related to multiple factors such as cesarian section38, pain after operation, anaesthesia, drowsiness of mother due to pain killer usage, natural low volume breast milk during the first 2 to 3 days, effect of stress39,40 infrequent breastfeeding,41,42 over covering by clothes, ambient temperature, lifestyle and willingness of mothers to breastfeeding.

Conclusions
This study indicate that weight loss in newborns are not more than 10% within the 48 hours after birth except, in female of group I neonates that is 13.5%. Thus for the protection of early weight loss and complications of low volume breast milk and decreased rate of readmission, we should reduce adverse factors such as cesarian section and stress that influence on milk production and ejection and the mothers be completely trained and encouraged for nursing before delivery.

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References


