The effect of breast feeding on mortality and weight gain in small for gestational age infants.

Nadia Adel Khesro
FIBMS Family medicine

Mahmood Abdulrazzaq
Msc orthopedic surgeon.

ABSTRACT
Background Small for gestational age as a term is used to define infant with a weight below 10th percent for gestational age or more than 2 standard deviations below mean for gestational age. The highest incidence of the adverse perinatal outcomes may be contributed to the intrauterine growth restricted infants.

AIM OF THE STUDY: To study the effect of breast feeding on outcome and weight gain in small for gestational age infants.

Methodology: A cross sectional study was carried on 61 small for gestational age New born < 1 week admitted to Neonatal Intensive Care Unit in Pediatric AL-Illiwiya Hospital in Baghdad and interviewed with mother by using detailed questionnaire

Result: The fatality rate for small for gestational age infants was 31.9%. The lowest death rate was found in breast fed neonates. In addition, the mean value for percent changes in body weight after two weeks compared to first week after birth was significantly higher to small for gestational age depending on breast fed compared with other type of feeding.

Conclusion: this study strengthen the importance of breast feeding for small for gestational age infants since the weight gain in breast fed neonates was higher compared to bottle or to mixed fed neonates and improving their outcome.

INTRODUCTION
The (WHO) defined small for gestational age (SGA) as any infant weight less than (2500 gram) at birth and delivered after 37 completed weeks of gestation (1).

Small for gestational age infants may experience numerous complications in the neonatal period related to the etiology of the growth insult as well as antepartum factors.(1)

Approximately 30% of (SGA) infants In the United States have IUGR and are born after 37 weeks of gestation. In developing countries 70% of them have IUGR.(1)

Regarding Arab countries the incidence of SGA in Oman (9%), Jordan (10%), (15), In a study done in Baghdad during May 2009, the prevalence of SGA was 21.3% (2).

Causes of low birth weight:
Strong positive correlation exists between both SGA and low socioeconomic status.Families of low socioeconomic status have relatively high incidence of maternal under nutrition, anemia, inadequate antenatal care, obstetric complications, maternal history of reproductule insufficiency (relative infertility, abortion, stillbirths, premature), smocking, and genitourinary tract infections(1), so the greater socioeconomic deprivation, the slower the rate of fetal growth.(3)

Other associated factors like, teenage pregnancies, close spacing of pregnancies, and mother who have born more than four previous children are also encountered more frequently(1)

Neonatal problems of small for gestational age infants:
1-Neonatal asphyxia and meconium aspiration:
Approximately one half of infants with IUGR have asphyxia and meconium aspiration so they act as a major cause of morbidity and mortality in IUGR babies (4).

2-Hypoglycemia.
3-Polycythemia-Hyperviscosity:
Is observed three to four times more frequently in the growth restricted infants secondary to intrauterine hypoxia.

4-Hypothermia:
Is another common problem of the growth restricted infants and results from decrease body fat stores secondary to intrauterine malnutrition (5).

5-Persistent Fetal Circulation:
Is a common sequel of prenatal hypoxia and acidosis that results in persistent blood flow through the ductus arteriosus (1).

6-Dysmorphology:
Results from chromosomal genetic disorders, oligohydramnios induced deformations, TORCH infection (1).

Neonatal Diagnosis
Reduced birth weight for gestational age “light for dates” is the simplest and oldest method of diagnosis: wasted or disproportionate growth. Soft tissue wasting, diminished skin fold thickness, decreases breast tissue, and reduced thigh circumference suggest recent wasting and are useful measurement for neonatal diagnosis (6).

Wide diameter skull sutures with large fontanells; shortened foot femoral and crown-heel length, and delayed development of epiphyseal sutures are common problems of the growth restricted infants. Head circumference may be reduced in some of them (7). Combinations of measurements such as weight/ head circumference, crown-heel length/ head circumference, and birth weight/ crown-heel length are being used more frequently to assess disproportionate pattern of fetal growth (8).

Management:
The key to proper management is early diagnosis and meticulous care, and proper attention to risk factors, careful clinical and chemical, evaluation, and utilization of newer ultra sonographic techniques should lead to detection of most SGA babies before birth.

At birth, the measures needed for clearing the airway initiating breathing, caring for the cord and eye and administering of vitamin K are the same in immature infants as in those of normal weight and maturity. Special care is required to maintain a patent airway and avoid potential aspiration of gastric contents.
Each mother was informed about the purpose of the study to gain permission to conduct the study. The study was approved by the Scientific Council of Family Medicine.

**Ethical consideration:**

This study was approved by the Scientific Council of Family Medicine. The permission to conduct the study was given by the manager of the hospital.

Each mother was informed about the purpose of the study to ensure better response and verbal consent was taken from them.

**Methods:**

SGA infants were diagnosed depending on birth weight less than 2500 gm in full term infants and on clinical features such as soft tissue wasting, diminished skin fold thickness, decrease breast tissue and reduced thigh circumference. (57).

Gestational age values were used for identification of SGA subjects whose mother did know their last menstrual period.

The study groups were followed until death or discharge from the hospital.

**Limitation of study:**

- Loss of neonates during follow up.

**Results**

**Fetal gender and Type of feeding:**

Table (1): The highest proportion of neonates was female and breast fed infants, the difference in proportion of in gender and breast feeding between SGA and NBW groups were not significant (P>0.05).

**Table (1) Distribution of neonates in the study groups according to the gender and type of feeding**

<table>
<thead>
<tr>
<th>Gender</th>
<th>SGA Group</th>
<th>NBW Group</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>34</td>
<td>39</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Male</td>
<td>27</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td>Type Of Feeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast</td>
<td>40</td>
<td>72</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Bottle</td>
<td>18</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Mixed</td>
<td>3</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

**Outcome:**

Table (2): About 2/3 of two groups were discharged on good health and 1/3 died.

**Table (2) Distribution of the study groups according to outcome on discharge**

<table>
<thead>
<tr>
<th>Outcome on Discharge</th>
<th>SGA Group</th>
<th>NBW Group</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survivors (good health)</td>
<td>32</td>
<td>68.1</td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>15</td>
<td>31.9</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

* Note: there are 14 SGA neonates were discharged on family responsibility

**Relation between death and sex and type of feeding:**

Table (3). Regarding sex: The highest proportion of death (43.3%) among SGA group was male, the difference in proportion was not significant. Regarding type of feeding: The lowest proportion of death occur in breast feeding neonates, the difference in proportion was statistically significant in SGA group.

**Table (3) the relation between the outcome (death) in study groups with the sex and type of feeding of infants**

<table>
<thead>
<tr>
<th>Sex</th>
<th>SGA Group</th>
<th>NBW Group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total No.</td>
<td>(Death) %</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>5</td>
<td>0.05</td>
</tr>
<tr>
<td>Male</td>
<td>23</td>
<td>10</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Type of feeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast</td>
<td>32</td>
<td>8</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Bottle</td>
<td>13</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Mixed</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Percent change in body wt. (g) after two weeks compared to first after birth:

Table (4): Shows the mean ± SE of percent change in body weight (g) after two weeks compared to first week after birth for the study groups according to sex and type of feeding

Table (4) the mean ± SE of percent change in body weight (g) after two weeks compared to first week after birth for the study groups

<table>
<thead>
<tr>
<th>Percent Change</th>
<th>SGA Group</th>
<th>NBW Group</th>
<th>t-Test</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Mean</td>
<td>SE</td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>Type of feeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2.5</td>
<td>1.58</td>
<td>32</td>
<td>11.3</td>
</tr>
<tr>
<td></td>
<td>1.8</td>
<td>1.81</td>
<td>21</td>
<td>11.7</td>
</tr>
<tr>
<td>Female</td>
<td>3.6</td>
<td>1.55</td>
<td>36</td>
<td>12.27</td>
</tr>
<tr>
<td>Breast</td>
<td>0.4</td>
<td>1.81</td>
<td>15</td>
<td>9.5</td>
</tr>
<tr>
<td>Bottle</td>
<td>1.8</td>
<td>6.79</td>
<td>72</td>
<td>10.3</td>
</tr>
<tr>
<td>Mixed</td>
<td>1.24</td>
<td>4.67</td>
<td>36</td>
<td>5.88</td>
</tr>
</tbody>
</table>

Note: 8 of SGA group were discharge on family responsibility.

Discussion

Concerning gender, the highest proportion of SGA group were females and this proportion was significantly higher than that in the NBW group. A study done by Meda et al., (1995) showed that female sex fetuses were associated with increased risk of IUGR (10)

Regarding types of feeding, this study showed that the highest proportion of SGA and NBW groups were breast fed and this agrees with a study done by Dip et al., (2000) which found that breast feeding is responsible for the majority low birth weight, regardless of socioeconomic status. (11)

From the follow up of the infants in the study groups, the fatality rates for SGA groups were 31.9% these values were higher than what had been reported by Ahmed (1994) who showed that the mortality rate in full term low birth weight (SGA) group was (11.1%), this rate may be due to small sample size of the study groups. (12)

Regarding the relation between death and sex of neonates for SGA group, death found in 43.5% of male and 20.8% of female

The "male disadvantage" with respect to neonatal mortality has been recognized, for more than two decade. Brothwood et al., (1986) confirmed that relative vulnerability of boys to perinatal mortality and morbidity, they observed a higher mortality in IUGR boys than in girls. (13)

Another study done by Stevenson et al., (2000) which reported that mortality for LBW male are higher than female. (14)

Regarding type of feeding our study showed that the lowest death rate were with breast feeding neonates, and this comparable to Botting et al study, (1997) which stated that breast feeding is valuable for premature and LBW infants who are known to be at great risk of health and developmental difficulties. (15)

When type of feeding was adjusted, the mean of percent change in body weight was significantly higher in SGA group for breast fed infants and this agrees with a study done by Asinidi et al., (1998) which found that mortality is closely related to the percent change in body weight. (16)

Conclusions

The fatality rate of SGA neonates was 31.9%, highest death rate was found in males, lowest death rate was found in breast fed infants. The mean birth weight and the percentage in weight changes after 1 week and after 2 weeks in SGA group was significantly higher in breast fed neonates compared to bottle fed or mixed fed neonates.

Recommendations

The role of breast feeding in maintaining adequate weight gain and improving the outcome of neonate should be clarified so that the mother will maintain on breast feeding after discharge.

Health education should be done through Primary Health Center about the risk factors related to SGA and premature births.

References