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Original Research Article

To Determine the Pattern of Change in Iron Stores of Exclusively Breast Fed Infants during First 06 Months of Life

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Abstract

Background & Methods: The aim of the study is to determine the pattern of change in iron stores of exclusively breast fed infants during first six months of life. The infants visiting the Immunisation centre for vaccination were enrolled for the study after written and informed consent. The infants who were healthy and exclusively breast fed and who fulfilled the inclusion criteria were followed up 3 times i.e. at 1.5, 3.5 and 6 months of age.

Results: Mean haemoglobin, mean MCV and mean serum Ferritin of infants born to mothers who received iron supplementation during pregnancy is 11.9gm/dl, 78.13fl and 108.46ng/ml; as compared to infants of mothers who did not receive iron during pregnancy which was 11.26 gm/dl, 78.08 fl and 76.94ng/ml respectively. At first visit, the mean values of serum ferritin was higher in infants born to mothers who received iron during pregnancy, with a statistically significant P value of 0.03.

Conclusion: In our study; out of 150 infants enrolled in the study, 65% of infants were not included for subsequent visits out of which 76.9% of infants lost to follow up; 18.5% of infants were not exclusively breast fed and 4.6% were dropped due to medical or surgical emergency. Mothers of 66% of infants received oral iron. There was no association between mean haemoglobin in infants born to mothers who received iron supplementation during pregnancy. However mean serum ferritin was significantly increased in infants of mother who received iron supplementation during pregnancy in all the three visits.

Keywords: pattern, iron, breast & infants.

Study Design: Observational Study.

1. Introduction

Nutrition is one of the most important factor in child health promotion, growth and development; especially during the first two years of life, when the speed of neuropsychomotor growth and development is greatest[1]. The health and nutrition of mothers and their children are intimately related. The effects of nutrition begin before conception, promoting intrauterine growth and development, physical growth and mental development[2].

Infant nutrition is one of the most significant aspects in child wellbeing, growth and development. Breastfeeding is the recommended method of feeding by all major infant health organizations[3]. If breastfeeding is not possible or desired, spoon feeding is done with expressed breast-milk or with infant formula(if required)However, Breast milk is

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recommended to be the best meal for infants. From birth to six months, infants should consume breast milk or an unmodified milk substitute till 6 months of age.
Breastfeeding and human milk are the normative standards for infant feeding and nutrition. In view of short- and long-term medical and neurodevelopmental advantages of breastfeeding, infant nutrition should be considered a public health issue and not only as a lifestyle choice[4]. The American Academy of Paediatrics recommends exclusive breastfeeding for 6 months of age, followed by continued breastfeeding as complementary foods are introduced, with continuation of breastfeeding for 1 year or longer as mutually desired by mother and infant.
Recently published research and systematic reviews have reinforced this fact that the breastfeeding and human milk are the reference normative standards for infant feeding and nutrition[5].

2. Material and Methods

Study was conducted at Bharat Vikas Parishad Hospital, Kota for 01 Year. Clearance for the study was obtained from the institutional ethics committee. A written consent was obtained from the parents of the subjects included. A convenient sample of 150 babies was taken, considering the 6 months follow up and drop outs.
The infants visiting the Immunisation centre for vaccination were enrolled for the study after written and informed consent. The infants who were healthy and exclusively breast fed and who fulfilled the inclusion criteria were followed up 3 times i.e. at 1.5, 3.5 and 6 months of age.

Inclusion criteria:

1. All neonates with birth weight more than 2500gms.
2. Fullterm babies on exclusive breast feeding or expressed breast milk by spoon and palade feed irrespective of maternal iron supplementation.

Exclusion criteria:

1. Babies having major medical or surgical problems and congenital anomalies.
2. Babies having history of NICU admission.

3. Result

Table 1: No of visits completed by the infants

No of visits completed	No of infants
01	19
02	79
03	52

Out of 150 infants enrolled, 19 infants completed only first visit, 79 completed 2 visits whereas 52 completed all the 3 visits.

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Table 2: Gender Distribution

No of visits completed	No of infants
Male	97
Female	53

Out of the total 150 infants enrolled in the study, 97 were males and 53 were females.

Table 3: Cutoff values will be used as lower limit of the normal

Age	Hb (gm/dl)	MCV (fl)	Serum Ferritin(ng/ml)
1.5 months	9.2	78	12
3.5months	9.7	78	12
6 months	10.8	71	12

Table 4: Incidence of maternal iron supplementation during pregnancy

No of visits completed	No of infants
Yes	107
No	43

Out of the 150 infants enrolled in the study, mothers of 107 infants received iron supplementation during pregnancy and mothers of 43 were not supplemented with iron.

Table 5: Hematolgical parameters of infants at first visit

Parameter	Mother received iron supplementation	Mother did not receive iron supplementation	P value
	Mean (SD)	Mean (SD)	
Hb gm/dl	11.9(1.98)	11.26(1.517)	0.213
MCV fl	78.13(6.52)	78.08(6.81)	0.901
Serum ferritin ng/l	108.46(84.33)	76.94(98.34)	0.032

Mean haemoglobin, mean MCV and mean serum Ferritin of infants born to mothers who received iron supplementation during pregnancy is 11.9gm/dl, 78.13fl and 108.46ng/ml; as compared to infants of mothers who did not receive iron during pregnancy which was 11.26 gm/dl, 78.08 fl and 76.94ng/ml respectively. At first visit, the mean values of serum ferritin was higher in infants born to mothers who received iron during pregnancy, with a statistically significant P value of 0.03.

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4. Discussion

In our study; out of 150 infants enrolled in the study, 65% of infants were not included for subsequent visits out of which 76.9% of infants (50 infants) lost to follow up; 18.5% of infants (12 infants) were not exclusively breast fed and 4.6% (3 infants) were dropped due to medical or surgical emergency[6].
The challenge was even greater due to the need of collecting 3 blood samples from the healthy children to describe variations in hemoglobin and serum ferritin. However the study could have been better if there were fewer dropouts[7].
Mothers of 66% (66) of infants received oral iron. There was no association between mean haemoglobin in infants born to mothers who received iron supplementation during pregnancy. However mean serum ferritin was significantly increased in infants of mothers who received iron supplementation during pregnancy[8].
Raj et al stated that exclusively breast fed infants of non-anemic as well as anemic mothers did not develop iron deficiency anemia till six months of age. However in our study we did not check anemic status of mother[9].
Murray et al. studied the effect of iron status of mothers in Nigeria on the concentration of iron in breast milk and reported that, infants feeding entirely on breast milk appeared to have normal iron status at six months.
Supplementation of iron in pregnant women has been suggested to improve iron status in the newborn; however, iron transport to the fetus is an active process and the fetus may be protected from ID even when the mother has moderate IDA[10].

5. Conclusion

In our study; out of 150 infants enrolled in the study, 65% of infants were not included for subsequent visits out of which 76.9% of infants lost to follow up; 18.5% of infants were not exclusively breast fed and 4.6% were dropped due to medical or surgical emergency. Mothers of 66% of infants received oral iron. There was no association between mean haemoglobin in infants born to mothers who received iron supplementation during pregnancy. However mean serum ferritin was significantly increased in infants of mother who received iron supplementation during pregnancy in all the three visits.

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