

## **Treatment of Anemia in Infants**

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**Objective:** To evaluate anemia among 9 month old infants.

**Setting:** Isa town health center.

**Design:** Retrospective.

**Method:** Screening booklets of infants were reviewed; personal data and hemoglobin were recorded for each patient from 16/7/2004 to 16/10/2004. Another group of booklets were reviewed from 1/3/2005 to 31/5/2005 to evaluate the improvement in treatment after intervention.

**Result:** The number of infants reviewed in the first group was 405, 296 attended the health center. Hundred and forty-seven infants (49.6%) had Hb of less than 11 g/dl and of these infants only 91 (61.9%) were given treatment. In the second group, the number of infants who were reviewed for the nine months screening was 271, of those only 217 attended and all had their Hb measured. Hundred and forty-two (65.5%) infants had Hb less than 11 g/dl and of those 133 (93.6%) infants were given treatment.

**Conclusion:** More infants received treatment in second group compared to group one. This reflected the improvement of treatment of infants of low Hb.

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Iron Deficiency Anemia (IDA), is an important health care concern. The World Health Organization (WHO) calls IDA the most common anemia, as it is estimated to affect approximately 2 billion people worldwide<sup>1</sup>.

Iron deficiency is responsible for lost productivity and premature death in adults and has been implicated as a cause of perinatal complications such as low birth weight and premature delivery in affected mothers<sup>1</sup>.

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In children, the initial manifestations may be subtle and amenable to treatment. Children with IDA are at risk for developmental and behavioral delays, including lower mental and motor test scores<sup>2</sup>.

The exact relationship between iron deficiency anemia and the developmental effects is not well understood, but these effects do not occur until iron deficiency becomes severe. At that point, treatment with iron can reverse the anemia and restore iron sufficiency, yet the poor developmental function appears to persist<sup>3</sup>.

Screening for anemia is common in clinical practice but controversy exists about universal application of reference norms and screening recommendation. Many studies seemed to agree with screening pediatric population, by hematocrit or hemoglobin levels, in areas with high prevalence rates. Others are with the primary prevention rather than the screening. Of these studies one found that IDA, during infancy, seems to induce mild auditory and visual dysfunction that is long lasting<sup>4</sup>.

Another study showed that the recommendations of the American Academy of Pediatrics (AAP) to screen for anemia and then treat children detected are inadequate and often unsuccessful<sup>5</sup>. There is no routine screening recommendation for ID, only for anemia, and so a large number of toddlers with ID – perhaps 30% – goes undetected. These young children are doubly at risk of neurodevelopmental impairment<sup>5</sup>.

Evidence appears to be sufficient to support the importance of preventing ID at all ages. However, the first two years of life, a period of rapid brain growth, and great vulnerability to psychomotor and mental impairment from ID, is of particular importance<sup>5</sup>. This supports the idea of the primary prevention of IDA rather than wasting the time on screening.

In July 2000, maternity and child health (MCH) supervisor meeting was held evaluating the screening service for IDA and introducing routine Hb screening at the ages of 9 months, 2 years, and 6 years. In collaboration with the nutrition department, routine iron drops were introduced in order to reduce IDA. (Appendix 1).

During our practice, we observed that not all infants at 9 months old with low Hb received treatment. Consequently, a survey was conducted in Isa Town Health Center in April 2003 about proper management of low Hb in 9 months old infants.

The aim of this study is to evaluate anemia among 9 month old infants attending Isa Town Health Center.

## **METHOD**

Screening booklets of infants were reviewed; personal data and hemoglobin were recorded for each patient from 16/7/2004 to 16/10/2004. Another group of booklets

were reviewed from 1/3/2005 to 31/5/2005 to evaluate the improvement in treatment after intervention.

## RESULT

The number of infants reviewed in the first group was 405, 296 attended at the health center. All infants who attended had their Hb measured. Hundred and forty-seven infants (49.6%) had Hb of less than 11g/dl and of these children only 91 (61.9%) infants were given treatment.

In the second group, the number of infants who were reviewed for the 9 months screening was 271, 217 attended and all had their Hb measured. Hundred and forty-two (65.5%) infants had Hb less than 11g/dl and of those 133 (93.6%) infants were given treatment. See table (1).

**Table 1 : Infant screened at Isa Town Health Center at nine months.**

The groups	1 <sup>st</sup> group	2 <sup>nd</sup> group
Number of infants booked	405	271
Number of infants attended	296(73.1%)	217(80.1%)
Number of infants with Hb<11g/dl	147(49.6%)	142(65.4%)
Number of infants with Hb<11g/dl and given treatment	91(61.9%)	133(93.6%)*

\*p value  $\leq$  0.05

## DISCUSSION

This study showed that anemia affects 50-65% of infants attending Isa Town Health Center. Compared to other studies, the prevalence of iron deficiency anemia in 9 months old infants using Hb and serum ferritin as the investigation of choice was 15% in one study<sup>6</sup>. In another study, the prevalence of iron deficiency anemia using Hb and serum ferritin as the investigation of choice was 19.7%<sup>7</sup>. We used only Hb as the investigation of choice which is of doubtful value in diagnosing anemia. In a study performed in Bahrain, 64.2% of infants were still breast-feeding up the age of one year<sup>14</sup>. Eventhough weaning started earlier in some children (4- 6 months), they are not provided with iron-rich supplements<sup>8</sup>.

We do not know whether these anemic infants are iron deficient or not. We need to do serum ferritin in order to confirm the state of iron depletion<sup>9</sup>.

Those anemic infants were given iron supplements depending on their Hb level. In order to justify our practice in the health center we need to do another study to see how many patients have iron deficiency anemia out of those with low Hb and how many are compliant with the medication.

Fortification of staple foods (cereals, flour, sugar, salt) to deliver micronutrients to children on a large scale is probably the most sustainable and affordable option even though commitment from governments and the food industry is needed<sup>10</sup>. Bahrain government has decided to fortify the flour with iron and folate since 2000, but there are no studies yet on the value of this fortification and how it helped in decreasing the incidence of iron deficiency anemia.

In the United States, primary prevention with iron supplementation and food fortification seems to have worked well in reducing the incidence of iron deficiency anemia<sup>11</sup>.

We cannot be certain that an infant does not have anemia if he has a normal hemoglobin level, or if the hemoglobin level is low<sup>12</sup>.

Screening for iron deficiency in toddlers by checking serum hemoglobin misses most children with iron deficiency. Therefore, it might be advisable to continue low dose supplementation of iron for all children rather than use a policy of “screen and treat”<sup>13</sup>.

The difficulties identified combined with the fluctuating nature of iron deficiency in the age group suggest that population screening for iron deficiency anemia is unlikely to be an appropriate strategy<sup>13</sup>.

The lower limit of normal Hb concentration at this age as stated by WHO is merely statistical cut off point, and does not tell us if children have a pathological cause for a low Hb concentration. Some children with Hb concentration of >11 g/dl are iron deficient and some with concentration below this value are iron replete<sup>10</sup>. Our inability to solve this problem, made us question the value of a screening approach for iron deficiency in primary care<sup>11</sup>.

Adherence to the recommendations that we advised was another major issue in this study. In this study, there was improvement in the performance of the treating team in the second group compared to the first group because of the following reasons.

Discussion of the results of the first group with the treating team, emphasizing on the importance of writing the treatment in the booklets and the importance of treating the border line Hb patients ( eg. 10.9 and 10.8) .

## CONCLUSION

**More infants received treatment in second group compared to group one. This reflected the improvement of treatment of infants of low Hb.**

## RECOMMENDATIONS

1. We don't feel justified to screen all infants for Hb unless we do serum ferritin.
2. Revising the policy regarding diagnosis and treatment of anemia.

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