Controversy: There is conflicting evidence regarding whether universal iron supplementation may be harmful to children in areas where the prevalence of malaria is high.

1. Study results of iron supplementation in areas of high vs. low malaria prevalence

   A. Evidence that universal iron supplementation may be linked to increased death and hospitalisation
      Two large randomised controlled trials with >24,000 children 1-36 months old (2006)
      i) Pemba Trial in Tanzania (High malaria prevalence)¹
         • Increased risk of severe illness, hospitalisation and death in preschool aged children receiving iron plus folic acid supplementation
         • Adverse effects (death or severe morbidity leading to hospital admission) found among iron-sufficient children
      ii) Nepal Study (Low malaria prevalence/malaria free)²
         • No effect on risk of death or rates of infections (e.g. diarrhoea and pneumonia)

   B. Evidence that universal iron supplementation is not linked to increased death and hospitalisation
      i) Cochrane Review, review of 68 trials in malarious and non-malarious areas, children < 18 years (2009)³
         • Iron supplementation did not increase risk of clinical malaria in 14 trials; risk was similar among children who were non-anaemic before iron supplementation
         • Increased risk of malaria with iron seen in trials that did not provide malaria control and treatment, iron plus antimalarial was protective for malaria (four trials)

      Conclusion: Iron does not increase risk of clinical malaria or death, when regular malaria control and treatment services are provided. There is no need to screen for anaemia prior to iron supplementation.

2. Recommendations and Policies:

   A. WHO Consultation on Prevention and Control of Iron Deficiency in infants and young children in malaria-endemic areas (Lyon, France in June 2006) (based on two trials in Tanzania and Nepal)
      • Give iron supplementation to low birth-weight or pre-term infants
      • Treat full-term normal birthweight infants younger than six months and children 6-24 months with iron if found to be iron deficient through screening, or with clinical symptoms of severe anaemia
      • Provide malaria control/prevention when using iron supplementation in malaria-endemic areas
      • Use complementary foods fortified with iron for young children (older than 6 months) in malaria-endemic areas because iron is consumed in smaller amounts; this avoids potential adverse effects of large amount of iron taken in a single dose
      • Avoid use of iron supplements with folic acid in malaria-endemic areas. Supplements with folic acid may reduce efficacy of anti-folate anti-malarial drug therapy

What’s New in Nutrition?

B. 2008 Symposium on Infant and Young Child Iron Deficiency and Iron Deficiency Anemia in Developing Countries

- Provide supplementation based either on screening out children with adequate iron levels or combining iron supplementation with effective disease control strategies (e.g. combining iron therapy with access to healthcare and anti-malarial drug therapy).
  - Iron supplementation appears to increase susceptibility to malaria; however iron appears extremely beneficial in iron-deficient children even in malaria endemic areas
  - Iron supplemented populations with access to health care AND active treatment of malaria have no significant increase in malaria prevalence

WV RECOMMENDATIONS:

In areas where malaria is endemic (high prevalence):

1. Promote use of iron-rich or iron-fortified foods (e.g. flour fortified with iron) to provide iron for young children (6-24 months). This is the safest option to provide adequate iron.
2. Do not use iron supplementation or home-prepared fortifications like Sprinkles for children until stable malaria prevention and treatment programs are available or anti-folate anti-malarial drug therapy is taken simultaneously.
3. Avoid use of folic acid supplementation while taking anti-folate anti-malarial drug therapy.
4. Promote use of iron supplements without folic acid for low birth-weight and pre-term babies.
5. Promote use of iron supplements without folic acid for iron-deficient or anaemic children.
6. Promote sleeping under long-lasting insecticide treated nets for children and pregnant mothers.
7. Promote seeking treatment for infants and young children when they have fever or malaria.

In areas where malaria is NOT endemic (low prevalence):

1. Promote use of iron supplementation with folic acid.

In all areas, improve iron status of infants and young children by simultaneously promoting and practicing:

1. Delayed cord clamping;
2. Early initiation and exclusive breastfeeding for the first six months;
3. Appropriate complementary feeding with iron rich foods (6-24 months);
4. Deworming, full immunisation for age, and using oral rehydration therapy with zinc for managing diarrhoea; and
5. Vitamin A supplementation.

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