

Vitamin Controversy

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The reports of deaths of children in Assam following massive doses of vitamin A administration during mass campaign in November 2001, and similar a episode in neonates in Tamil Nadu some months earlier, have provoked extended controversy. Clearly, there is an urgent need to formulate guidelines based on scientific and epidemiological evidence, for the use of vitamins in general, and for massive doses of vitamin A in particular.

Administration of massive doses of Vitamin A

Mass coverage of children with Vitamin A was initiated 30 years ago by the National Institute of Nutrition when keratomalacia was a major public health problem in India. Since then, there has been a rapid decline in the incidence of vitamin A deficiency in the community; it is no longer a public health problem today. Mild cases of vitamin A deficiency do occur in some parts of the country but they does not justify mass campaigns. Even when mass campaigns were conducted, their limitations were known but the campaigns were seen as a short-term emergency measure to prevent blindness.

Massive doses of Vitamin A are necessary to treat vitamin A deficiency. They may be justified as prophylaxis only in vulnerable select groups of children. Areas with a high prevalence of Vitamin A deficiency in children may be considered for mass coverage. However, infants and sick older children should not be administered massive doses of Vitamin A, because of the risk of toxic effects.

There is no concrete evidence in favour of using Vitamin A for reduction of childhood mortality. No additional dose of Vitamin A is recommended in children suffering from respiratory infections or diarrhoea.

More than 50 per cent of Indian children are stunted and suffer from multiple deficiencies including protein-energy malnutrition and anaemia. Vitamin A deficiency is not a major contributor to the vast majority of these problems. More than specific supplements, what is needed is a general improvement in diet, including green leafy vegetables and seasonal fruits. Even if a few children do need extra doses of Vitamin A, natural sources such as red palm oil serve the purpose better; they are harmless and also produced in the country. Synthetic preparations, besides being costly, must be given in precise doses and administered under supervision. They should be reserved for specific situations.

Analysis of the Assam incident

In the first place, combining vitamin A administration with the pulse polio programme is a blatant violation of scientific and epidemiological evidence. It is also against the views expressed by the National consultation on Vitamin A.

While it is necessary to cover all children under the age of

five years in the pulse polio programme, Vitamin A should not be administered to infants less than nine months of age. Further, most children in the community may not require massive doses of Vitamin A. It is also advisable to avoid administering Vitamin A to sick children. Massive doses of Vitamin A are likely to cause side effects in a few children and, if linked with the pulse polio programme, may come in the way of successful polio eradication. For this reason, the national consultation on Vitamin A had clearly expressed the view that massive doses of Vitamin A were not to be used with the pulse polio programme.

It was reported that several children became sick after the administration of Vitamin A, and 31 children died. The government has stated that the deaths may have been caused by the administration of a wrong dose, as the 2 ml spoon was replaced with a 5 ml cup as a measure.

UNICEF has stated that since 1-5 year mortality is about 7 per thousand, more than 300 children of the 3 million children covered would have died in the week under question, regardless of the programme. They also state that the preparation was of good quality and safe. **In other words, the deaths were not related to the administration of Vitamin A.**

The fact that several children fell ill at the same time suggests that the Vitamin A dose must have in some way contributed to their illness. The problem could lie either in the large dose of Vitamin A, in bacterial contamination, or the use of an outdated product with resulting toxicity.

In a healthy child, a very large single oral dose – 100,000 units of Vitamin A per kg of body weight – is considered fatal. However, it is possible that a much smaller dose especially in an infant or sick child could lead to fatality. Bacterial contamination seems to be unlikely. It is anybody's guess whether the product was outdated and therefore toxic.

Since the exact mode of death has not been made not clear, it is not possible at this stage to come to final conclusion without sufficient data. Still, it is difficult to justify such a programme and one may question the motives behind it.

In view of recent events, the policy of mass vitamin A administration to infants and children needs to be reviewed. As Vitamin A deficiency is no longer a major health problem in the community, there is no need to continue this universal community programme at the risk of provoking toxic reactions. The risk-benefit ratio is in favour of the selective use of Vitamin A supplements only to only those who have deficiency, and not to all children in the community.

Routine vitamin supplements to healthy infants

There is enough scientific evidence that normal new-borns on breast feeds do not require routine vitamin supplements. Further, timely and proper weaning at about four to six

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months of age, coupled with continuation of breast-feeding, ensures an adequate supply of vitamins and minerals in the diet. It is only in select situations, such as if the neonate is pre-term, or the child is ill, that vitamin supplements may be necessary. Pre-term neonates are short of maternally transferred nutrients due to their shorter than normal gestational period. It is known that breast milk secreted by the pre-term neonate's mother cannot meet the demands of the baby adequately, and hence routine vitamin supplementation is rational.

However, not all market preparations are ideal in composition and most of them contain unbalanced amounts of different vitamins. Co-prescription of vitamin B complex for children on short-term antibiotic therapy is not at all necessary and is often overused, due to pharmaceutical selling tactics.

Iron supplements are often necessary in children between the age of months and three years, especially if the child's eating habits are not well inculcated. Such children are often short of iron in the diet and further iron absorption depends upon so many variables that only a small proportion of ingested iron is finally available for formation of haemoglobin. Hence, iron supplements are usually justified in that age group. Also, it is difficult to judge iron deficiency clinically in early stages, as symptoms are subtle and non-specific, and physical signs become evident much later. Children presenting with pica need iron supplements, as do those who present with breath holding spasms.

Calcium supplements are not routinely required, as milk is the main source of nutrition in infants. However, they may be necessary in case of prolonged milk feeding with concomitant vitamin D deficiency, in which case supplements of vitamin D are required along with calcium.

In the case of vitamin D deficiency, we are now aware that such a deficiency exists in the community, probably at all age groups, though its clinical as well as radiological manifestations vary widely depending on the severity of deficiency. Such a wide spectrum of presentations is not easily known and diagnosed by physicians, and hence supplements of vitamin D are usually administered only in case of a severe deficiency state. A minor sign of deficiency are not picked up. There is also a myth about the abundance of vitamin D available from sunlight in our country.

Vitamins may be toxic

However, fat-soluble vitamins such as Vitamin A, D, E and K are stored in the body and may lead to chronic toxicity. If consumed in large doses over a short time, they can be even fatal. Thus, supplements of these vitamins should be used with caution. On the other hand, an excess of water-soluble vitamins such as vitamin B and C cannot be stored in the body, and hence ingesting large doses may be wasted.

In summary, routine supplements of vitamins are not necessary for normal new-borns, infants and children. However, they are required for normal pre-term new-borns. Otherwise supplements of vitamins should be reserved for treatment of deficiency states or when deficiency may be anticipated, as in case of mal-absorption syndromes.

There is no doubt that vitamins are overused, especially in children who do not need the supplements. Daily supplements of multivitamins are certainly not required in normal neonates, infants and children on a standard feeding regime. Those who need vitamin supplements often require therapeutic doses of vitamins to treat specific deficiencies, and are not benefited by routine doses. The routine practice of multivitamin supplementation to neonates is followed by most obstetricians, and hence life for the majority starts with vitamin supplements, even when mothers may not get proper advice on feeding. Thereafter most parents prefer to continue such supplements.

I personally feel that pressure from industry is not a major determinant of this overuse of vitamins, because vitamin preparations are not major contributors to the pharmaceutical industry's profits, and most doctors and parents are habituated to use them anyway. They are used as tonics to boost appetite and health. Most doctors use these preparations thinking that they are useful; others use them because they feel that at least they are harmless.

Amongst all vitamins, B-complex is often used by doctors as co-prescription with antibiotics. This practice is wrongly propagated by industry.

As the subject of nutrition is neglected by most of the curriculum at all levels, doctors are also poorly informed. I strongly feel that doctors are at fault and not the industry in cases of vitamin prescription.

The national policy regarding the use of vitamins in community programmes is restricted to the use of vitamin A. There seems to be a clear consensus in favour of discontinuing the mass vitamin A supplementation programme. Besides this, there is a need to formulate national recommendations for the rational use of vitamins and minerals, clearly specifying the target group which does require such supplements.

References:

1. National consultation on benefits and safety of administration of Vitamin A to pre-school children and pregnant and lactating women *Indian Pediatrics* 2001 January; 38 (1): 37-42
2. Gopalan C The Vitamin A fiasco. *Nutrisearch* 2001 October-December; 8 (4).

Karachi doctors under attack

In the past three years, more than 80 doctors have been killed in Pakistan's largest city, ambushed during their daily commutes ... The Pakistan Medical Association, the largest professional body of doctors in Pakistan, began leading a wave of protest strikes ... The delivery of medical care in the city has suffered... It goes against the ethic of our profession, but we are desperate and scrambling. .. Because a particular religious sect has been targeted, the origins of the attacks may well be in religious extremism.. .

Saad Shafqat, A new hazard of medicine. *BMJ* April 27, 2002