India's Universal Mega-dose Vitamin A Supplement Program: Time to Bid Goodbye!

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Mega-dose vitamin A supplementation (MDVAS) was initiated by the Govt. of India in 1970 as a stop gap arrangement to tackle the issue of clinical vitamin A deficiency, resulting in childhood blindness. Half-a-century later, the program continues as such, without any re-evaluation. All under-five children are being administered 9 mega doses of vitamin A with first dose starting from 9 months of age, followed by two doses every year between 1-5 years.

Started primarily for decreasing the prevalence of xerophthalmia, the program was taken up by the World Health Organization (WHO) and promoted and projected to reduce the overall child morbidity and mortality in settings where vitamin A deficiency was recognized as a public health problem. However, massive reduction in clinical signs of vitamin A deficiency, improved diets, substantial declines in under-five mortality, and lack of consistent evidence of survival benefit in the Indian context have prompted an urgent evidence-based relook at the wisdom of continuing this program [1].

WHO defines vitamin A deficiency as a significant public health problem, when the prevalence of night blindness is >1% in children between 2-5 years and/or the serum retinol levels are below 20 µg/dL in ≤20% of children aged 6-59 months [2]. The recent Comprehensive National Nutrition Survey (CNNS; 2016-18) conducted in 30 states has shown the prevalence of vitamin A deficiency (VAD; defined as serum retinol <20 µg/dL) in 1-4 year old children as 15.7% (95% CI 15.2%, 16.3%), after adjusting for inflammation (objectively measured by elevated levels of C-reactive protein). There was no urban/rural or sex differences in prevalence. Also, the VAD prevalence was below 20% at the National level, irrespective of whether the children had received MDVAS in the past 6 months [3]. This definitely proved the point that vitamin A supplementation under programmatic circumstances had negligible role in increasing serum retinol concentration.

Looking at the state-wise data, only Jharkhand, Mizoram and Telangana qualified as states having the lower 95% CI of VAD prevalence above 20%. Add to these the states where the lower CI could be <20%, but the point prevalence was >20%, these included Bihar, Haryana, Madhya Pradesh, and Uttar Pradesh. It appears logical that except these seven states, the universal MDVAS can be safely discontinued in other areas. There are also five union territories for which serum retinol data are not available i.e., Andaman Nicobar Island, Chandigarh, Lakshadweep, Puducherry and Dadra Nagar Haveli, and Daman and Diu. Decisions on these can be taken based on experience and data of states which are geographically and culturally closest. Another issue worth considering is reduction of ongoing 9 doses to 5 doses (i.e. up to 3 years of age) in areas targeted for MDVAS.

It is important to note that the CNNS survey was performed before the regulations on the mandatory vitamin A fortification of cooking oil and the voluntary vitamin A fortification of milk were notified by the Indian government in 2018 [4]. The risk of excessive vitamin A intake related harm, from multiple vitamin A interventions coupled with dietary intakes, is now real and needs to be mitigated. Accounting for the potential acute toxicity of MDVAS, the campaign mode (i.e. the biannual round) administration needs to be stopped altogether.

Reduction in all cause child mortality, mediated by vitamin A supplementation, should be analyzed for the intended target population. A meta-analysis of 5 studies of MDVAS conducted in India and its effect on mortality showed no significant survival benefit [5], in contrast to the Cochrane analysis of global evidence that included much older trials when vitamin A deficiency was rife [6]. Further, considering the current 6 months to 5-year mortality rate in India, even the estimated 12% mortality reduction from the meta-analysis of global trials has no practical relevance, especially with suboptimal programmatic coverage [5]. The current under-five mortality in India is mainly contributed by neonatal deaths, where there is no role of universal MDVAS, as it is started only after 6 month of age.

A valid concern is the availability of vitamin A following phasing out of MDVAS. It needs to be emphasized that vitamin A should remain an essential part of Essential Drug list for therapeutic use in measles, severe acute malnutrition, chronic liver disease, and persistent diarrhea.

Surveillance and monitoring for both mortality and ocular manifestations will remain the key gauge for success and safety of targeted intervention following withdrawal of MDVAS from several states. The strategy in targeted states will also need to be revisited after 3-4 years.

We need to understand that there are no magical solutions or quick fixes for achieving permanency of positive outcomes. Long-term solutions to public health problems need to consistently aim at improving our health care delivery infrastructure, promoting living conditions, holistic approaches, and sustainable food-based solutions.

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REFERENCES

1. Greiner T, Mason J, Benn CS, Sachdev HPS. Does India need a universal high-dose vitamin A supplementation program? *Indian J Pediatr.* 2019;86:538-41.
2. WHO Guideline. Vitamin A supplementation in infants and children 6-59 months of age. Geneva: WHO; 2011.
3. Comprehensive National Nutrition Survey (CNNS). Ministry of Health and Family Welfare (MoHFW), Government of India, UNICEF and Population Council. 2019.
4. National Report. New Delhi. Food Safety and Standards Authority of India (FSSAI). Gazette of India: Notification, Part-2: standards on fortification. Ministry of Health and Family Welfare; 2018.
5. Reddy GB, Pullakhandam R, Ghosh S, et al. Vitamin A deficiency among children younger than 5 y in India: An analysis of national data sets to reflect on the need for vitamin A supplementation. *Am J Clin Nutr.* 2020. Dec 16:nqaa314.
6. Imdad A, Mayo-Wilson E, Herzer K, Bhutta ZA. Vitamin A supplementation for preventing morbidity and mortality in children from six months to five years of age. *Cochrane Database Syst Rev.* 2017;3:CD008524.