Policy question: Is routine Vitamin A supplementation still justified for children in Nepal?

Trial synthesis findings applied to Nepal national mortality estimates

Background

The World Health Organization (WHO) has recommended Vitamin A supplements to all children under five years (6-59 months) in low- and middle-income countries (LMICs). Existing evidence that Vitamin A reduces child mortality was generated mainly from trials conducted before 2000, against a backdrop of high childhood infections rates, greater malnutrition, and higher child mortality.

Nepal has been distributing Vitamin A supplements to children twice a year since 1993, covering approximately 2.7 million children.

Problem Statement

Nepal has made substantial progress in terms of reduction of under-five mortality rates, incidence of measles and diarrhoea in the last decade. In addition, nationwide surveys have shown that the country has reduced underweight, wasting, and stunting and the prevalence of Vitamin A Deficiency (VAD) is only 4% among under 5 years children in Nepal.

Health service delivery including treatment of diarrhoea, and measles immunization coverage has also improved. Despite such progress, Nepal is continuing the blanket supplementation of Vitamin A biannually which has a substantial cost burden for procurement and distribution for a low-income country. Therefore, it is now appropriate to evaluate and discuss the evidence in respect to continuing blanket supplementation or revising the Vitamin A supplementation programme to target only high risk groups.

Key Findings

We performed a Meta-analysis of six well conducted trials among 1,046,829 children that had allocation concealment. The analysis showed that there is only a small mortality reduction with Vitamin A supplementation (RR 0.91, 95% CI 0.85 to 0.97%).

We then applied this effect estimate to current values of under 5 mortality in Nepal. This analysis suggested routine Vitamin A supplementation prevents between 1 and 4 deaths in every 1,000 children supplemented during childhood. (see table). There is low certainty of evidence in terms of precision and high heterogeneity among the studies.

The full study is published here:

Shrestha, S., Thapa, S., Garner, P., Caws, M., Gurung, S. C., Fox, T., Kirubakaran, R., & Pokhrel, K. N. (2022). Is routine Vitamin A supplementation still justified for children in Nepal? Trial synthesis findings applied to Nepal national mortality estimates. PloS one, 17(5), e0268507. https://doi.org/10.1371/journal.pone.0268507

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Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	Absolute (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with control (current estimates)	Risk with Vitamin A supplementation					
All-cause child mortality	**28 per 1,000** (U5MR in Nepal)	**25 per 1,000** (24 to 27)	**RR 0.91** (0.85 to 0.97)	**3 fewer per 1,000** (from 4 fewer to 1 fewer)	1,046,829 (6 RCTs)	⨁⨁◯◯ Low[a,b]	Vitamin A supplementation may result in a small reduction in child mortality

***The risk in the intervention group** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).
CI: Confidence Interval; **RR:** risk ratio **U5MR:** Under-Five Mortality Rate

GRADE Working Group grades of evidence
High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of effect.

Implementation Considerations

Routine Vitamin A may no longer result in a significant reduction in child mortality in Nepal. It may therefore be appropriate to revise the current Vitamin A supplementation strategy to a targeted approach, supplementing only those children at high risk of Vitamin A deficiency. A randomised trial of targeted vs. blanket supplementation should be considered by the government of Nepal to determine the optimal strategy for Vitamin A supplementation in the current development context.

This publication is part of the Research, Evidence and Development Initiative (READ-It https://www.evidence4health.org). The Research was performed by Birat Nepal Medical Trust working with colleagues from the Centre for Evidence Synthesis in Global Health at the Liverpool School of Tropical Medicine.

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