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Nutrition News for Africa

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Abstract - May 2009

Neonatal vitamin A supplementation for prevention of mortality and morbidity in infancy: systematic review of randomised controlled trials.

Gogia S, Sachdev HS. BMJ;338:b919, 2009.

A Central Question Not Answered: Can Newborn Vitamin A Reduce Infant Mortality in South Asia?

West, KP Jr., Sommer A, Tielsch JM, Katz J, Christian P, Klemm RDW. BMJ e-letter (2 April 2009).

Introduction

Newborn vitamin A supplementation (NVAS) has been proposed as a possible intervention to reduce infant mortality, but currently available studies demonstrate inconsistent results of NVAS on infant health and survival. To clarify the situation with regard to NVAS, the World Health Organization recently commissioned a systematic review of this topic and convened a technical consultation to consider additional research needs. The results of this review and the ensuing debate that it inspired are the subject of this month's edition of NNA.

Methods

The systematic review included six randomized or quasi-randomized, placebo-controlled trials that evaluated the effects of prophylactic neonatal (<1 month) vitamin A supplementation on mortality or morbidity within the first year of life and on adverse effects occurring with the first 7 days following supplementation (Goggia, 2009). The trials were identified using standard bibliographic search methods. The criteria for including studies in the analysis were that they were randomized, masked, controlled trials of apparently healthy subjects who received the assigned supplement within the first month post-partum. The comparison groups were comprised of infants who received a placebo and whose mothers received a placebo or no supplementation.

The primary outcomes that were examined were relative risks for all-cause child mortality during the neonatal period and up to 1 year of age; and secondary outcomes included cause-specific mortality due to diarrhea, acute respiratory infections, and other causes. Early adverse effects, such as bulging fontanelle, vomiting, irritability, diarrhea, and fever within one week of the intervention, were also assessed. Of the 72 references initially identified, 11 reports of six trials met all inclusion criteria. Four of the trials were conducted in Asia, and two were completed in Africa.

Results and Conclusions

Three trials in Indonesia (Humphrey et al., 1996), Bangladesh (Klemm, 2008), and South India (Rahmathullah, 2003) all demonstrated a significant reduction in infant mortality among newborns who were supplemented with 50,000 IU of vitamin A within 48 hours of birth compared to control groups. Conversely, no significant impact on neonatal mortality was found in a study in Nepal, where the vitamin A supplements were provided after the first few days of life (West, 1995). Likewise, no mortality reduction was detected in the two studies in sub-Saharan Africa, including trials conducted in Guinea-Bissau (Fisker, 2007) and Zimbabwe (Malaba, 2006), where there was a lower prevalence of vitamin A deficiency and/or a lower infant mortality rate.

Considering the full set of findings, the authors of the systematic review concluded that the available data from all 6 trials involving 42,508 infants indicated no evidence of a reduced risk of mortality due to any cause during first year of life among infants who were supplemented with vitamin A during the neonatal period compared to those who received placebo. The

overall pooled relative risk in their random effects model was 0.92 (95% Confidence Interval 0.75 to 1.12, P=0.393). No adverse effects of NVAS were reported.

Program and Policy Implications

Based on the lack of a significant overall effect of NVAS on infant survival when the results of all six studies were combined, the authors of the systematic review stated that there is insufficient information to promote policies for NVAS, and they called for additional trials to be conducted in Asia and Africa. However, this conclusion has been contested by several investigators, who claim that the review was flawed by inclusion of studies from settings in Africa, where either the population was not vitamin A deficient or the infant mortality rate was relatively low and therefore unlikely to respond to vitamin A, and by including the study from Nepal, in which the vitamin A supplements were delivered after the first few days of life. Many in the public health community argue further that the significant ~20 percent reduction in infant mortality found in the trials from South Asia when NVAS was provided within the first few days post-partum justifies proceeding with operations research to explore the feasibility of supplementation in the first few days of life in Asian countries with a high prevalence of vitamin A deficiency and high rates of infant mortality (West, 2007).

NNA Editors' comments

The results from three randomized trials in South Asia, in which NVAS was provided within the first few days of life, indicate a significant impact on infant mortality. Nevertheless, the logistical and financial challenges of reaching newborns in the highest risk countries may limit the feasibility of this strategy in settings where most infants are delivered at home and do not receive a medical exam in the first week of life, and where health infrastructure is weak and cultural norms may proscribe outside contact with the newborn. Indeed, experience with maternal post-partum VAS, which achieves less than 50% coverage in most places, illustrates the magnitude of the challenges that must be faced.

Regardless of the decisions taken in individual Asian countries, there seems to be consensus that the currently available information from African countries is insufficient to justify specific policy formulation regarding NVAS in this region.

References

Klemm RDW, Labrique AB, Christian P, Rashid M, Shamim AA, Katz J, et al. Newborn vitamin A supplementation reduced infant mortality in rural Bangladesh. Pediatrics 2008; 122:e242-e250.

Humphrey JH, Agoestina T, Wu LA, Usman M, Nurachim D, Subardja S, Hidayat J, Tielsch K, West KP, JR., & Sommer A. Impact of neonatal vitamin A supplementation on infant morbidity and mortality. The Journal of Pediatrics 1996; 128(4):489-496.

Humphrey JH, Iliff PJ, Marinda ET, Mutasa K, Moulton LH, Chidawanyika H, Ward BJ, Nathoo KJ, Malaba LC, Zijenah LS, Zvandasara P, Ntozini R, Mzengeza F, Mahomva AI, Ruff AJ, Mbizvo MT, Zunguza CD; the ZVITAMBO Study Group. Effects of a single large dose of vitamin A, given during the postpartum period to HIV-positive women and their infants, on child HIV infection, HIV-free survival, and mortality. J Infect Dis 2006 Mar 15;193(6):860-71.

Malaba LC, Iliff PL, Nathoo KJ, Marinda E, Moulton LH, Zijenah LS, Zvandasara P, Ward BJ, the ZVITAMBO Study Group & Humphrey JH. Effect of postpartum maternal or neonatal vitamin A supplementation on infant mortality among infants born to HIV-negative mothers in Zimbabwe. Am J Clin Nutr 2005; 81:454-60.

Rahmathullah L, Tielsch JM, Thulasiraj RD, Katz J, Coles C, Devi S, John R, Parakash, K, Sadanand AV, Edwin N, & Kamaraj C. Impact of supplementing newborn infants with vitamin A on early infant mortality: community based randomized trial in southern India. BMJ 2003; 327;254:1-6.

West KP, Jr. Newborn vitamin A dosing: Policy implications for Asia and Africa. Micronutrient Forum Abstracts, Istanbul, Turkey, 16-18 April 2007.

West KP, JR., Katz J, Shrestha SR, LeClerq SC, Khatry SK, Pradhan EK, Adhikari R, Wu LSF, Pokhrel RP, & Sommer A. Mortality of infants <6 mo of age supplemented with vitamin A: a randomized, double-masked trial in Nepal. Am J Clin Nutr 1995; 62:143-8.

New publications

In this month's NNA, we are launching a new section to notify subscribers of recently released publications on public health nutrition issues relevant to Africa, which might be of interest to our readership. Please send us information on any publications that you think would fit this description.

1. WHO and UNICEF released a joint statement on WHO child growth standards and the identification of severe acute malnutrition in infants and children (available at: http://www.who.int/nutrition/publications/severemalnutrition/9789241598163/en/index.html).

2. The Food and Nutrition Technical Assistance Project (FANTA-2) released two new publications:

Cluster designs to assess the prevalence of acute malnutrition by lot quality assurance sampling: A validation study by computer simulation (available at: http://www.fantaproject.org/publications/rsss09.shtml).

Interagency review of selective feeding programs in South, North and West Darfur States, Sudan March 8 - April 10, 2008 (available at: http://www.fantaproject.org/publications/sudan_feeding2009.shtml).