

Vitamin K Prophylaxis for Newborns: A Position Paper

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TH Tulchinsky MD MPH
Adjunct Associate Professor
Braun School of Public Health
Hebrew University-Hadassah, Ein Karem, Jerusalem, Israel

Hemorrhagic Disease of the Newborn (HDN), now known Vitamin K Deficiency Bleeding Disorder (VKDB), has been a recognized clinical entity for over 150 years, and the discovery of vitamin K led to a Nobel Prize for Dam and Doisy in 1943. Vitamin K given to newborns as a routine has been the standard recommendation by the American Academy of Pediatrics since 1961, and reaffirmed in 2003 (1). Vitamin K by injection is mandatory in the United States (2) and other countries.

Despite its wide professional acceptance and successful application (3), the subject of routine vitamin K for newborns has not been adopted by major international health organizations such as WHO, UNICEF and other aid agencies. In 2005, Lancet published a special series on neonatal mortality in developing countries and a follow-up in 2006 (4) which failed to address or even mention HDN, or VKDB or Vitamin K. Nor are these included in a 2006 WHO guide for pregnancy and newborn care (5) which serves as a guide and standard of care especially for developing countries.

These omissions are surprising and regrettable since clinically significant unexpected bleeding occurs in 2.5 to 17.0 per thousand newborns not given vitamin K prophylactically (1) in the gastrointestinal or urinary tract, the umbilical stump and intracranially. Late VKDB is often manifesting as sudden central nervous system hemorrhage, and ranges from 4.4 to 7.2 per 100,000 births (1, 3). This may be an under reporting as non traumatic intracranial hemorrhage is a common cause of death in neonates and may not be attributed to late VKDB especially in developing and transition countries.

Controversy during the 1990s has been settled with the consensus that Vitamin K given intramuscularly is safe method of preventing early and late VKDB. Debates re oral versus intramuscular routes notwithstanding, vitamin K is a beneficial and inexpensive saver of lives, preferably given intramuscularly at birth, greatly reducing risk of late VKDB and intracranial hemorrhages.

A study from Vietnam reports an estimated incidence of late onset vitamin K deficiency bleeding in infants who received no prophylaxis was 116 per 100,000 births (142 and 81 in rural and urban areas respectively) with mortality of 9% (6). Late HDN presents especially among low birth weight exclusively breast fed infants, often with intracranial hemorrhages without other signs of bleeding. Reports from Turkey of late HDN indicate this is a widespread problem (7-9). In India where routine vitamin K prophylaxis is not practiced on hospital reports on 42 cases of late HDN with intracranial hemorrhage over a four year period (10).

Public health policy in developing countries should place intramuscular injection of vitamin K for all newborns (along with other preventive measures such as tetanus and other immunization, professional supervision of prenatal care and deliveries, eye and cord care, vitamin A and D supplements, among other measures recommended).

Even in Europe, late HDN is still reported, as in the Netherlands at 3.2/100,000 live births in 2005 despite nearly universal use of oral vitamin K (11). Cases of late HDN with intracranial

hemorrhage with severe neurological sequelae still occur in the US where home deliveries and parental refusal of vitamin K injections have become more common (12), as well as in the UK where oral vitamin K is now nearly universally used although by a variety of protocols used (13). A Cochrane review of 2000, renewed in 2003, supports use of vitamin K for all newborns(14). The weight of evidence indicates that vitamin K by injection has the advantage over oral route since one dose suffices while orally more than 3 doses are required.

WHO has the professional leadership responsibility to state what is beneficial according to current professional standards. WHO currently recommends immunizations (e.g., Hib, pneumococcal pneumonia) and other procedures protective and meant to reduce preventable morbidity and mortality, yet not all countries adopt these at the same moment. The international community has adopted Millennium Development Goals including targets of reduction of maternal and child morbidity and mortality. While VKDBD is clearly not the major cause of current excess morbidity and mortality of infants, it is a preventable problem and should be adopted internationally. Many mid level developing and transition countries Can manage the modest cost of this measure.

Vitamin K should be recommended by WHO, UNICEF and other international health organizations and funders for routine, mandatory prophylaxis for newborns and made widely known through relevant publications and media coverage.

Summary

1. VKDBD is a significant neonatal threat which is entirely preventable by universal prophylaxis for newborns with a safe and inexpensive intervention that is akin to immunization e.g. for neonatal tetanus.
2. While the danger is greater in developing countries it is still important in the European Region, including in Western Europe.
3. Professional confusion on the topic generated in the 1990s, and widespread neglect of the subject was indicated by non inclusion of this subject in recent major reviews of neonatal mortality such as that in Lancet in 2005 and 2006.
4. The oral or low dose IM options to the well established, proven and safe IM route have resulted in appearance of late HDN as intracranial hemorrhages, so if you present these alternatives you must emphasize the need for multiple dosages required of the "alternatives".
5. WHO must in my view issue a special policy statement on this world wide problem as part of efforts to reduce the burden of neonatal mortality and morbidity especially in relation to low birth weight, exclusively breast fed infants.
6. International efforts to reduce infant and child mortality as in the Millennium Development Goals should include funding and organizing universal Vitamin K for newborns.
7. WHO leadership with sister agencies such as UNICEF and international funding agencies, bilateral aid programs and with member states would enhance efforts to gain control of this totally preventable problem.
8. The statement should include recommended standing orders for national governments and other agencies re mandatory vitamin K administration preferably by IM or if by mouth in multiple dosages.
9. The secondary gains from mandatory vitamin K at childbirth would be in promoting delivery under medical care or supervision, and raising standards of measurable care in delivery centers.
10. The available cumulative evidence makes this a public health matter of very high importance.

In short, a clear policy statement by WHO Geneva would clarify the issue for responsible implementation on a world wide scale, including gaining recognition and possibly funding support by international and bi-national funders. The final responsibility is with national governments but it is not solely a matter for individual health care providers, and WHO has the responsibility for leadership on this issue.

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