

Weekly Vitamin K in Neonates on Prolonged Antibiotic Therapy

In an interesting study, published recently in *Indian Pediatrics*, Sethi, *et al.* [1] have raised a very valid question about the practice of giving weekly vitamin K injections to neonates on antibiotics for more than one week. Antibiotics that are used in the treatment of neonatal infections may have different effects on vitamin K levels through different mechanisms of action [2]. Additionally, K1 and K3 isoforms, that are used here, based upon logistic obtainability may have different bioavailability, pharmacodynamic effect and hence, may produce a non-uniform effect [3]. Half-life ($t_{1/2}$) of PIVKA-II is more than 70 hours [4]; this $t_{1/2}$ progressively increases with age. Hence, the duration of 7 ± 2 days may not be a good enough interval to assess the fall (from 992 to non-significant levels of < 2 ng/mL). The lack of standard reference for PIVKA levels in premature neonates further adds to the conundrum [5]. The $t_{1/2}$ of Vit K dependent coagulation factors is only a few hours; estimation of easily available parameters like serum prothrombin level, probably would have been a better surrogate marker and more clinically applicable.

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Preventive Role of Vitamin K in Antibiotic-induced Vitamin K Deficiency Bleeding in Neonates

Vitamin K deficiency following broad spectrum antibiotic usage has been reported in adult and pediatric studies [1], but conclusive evidence in neonatal age group is lacking. In the June recent issue of *Indian Pediatrics*, Sethi, *et al.* [2] reported 100% prevalence of vitamin K deficiency in hospitalized newborns at enrolment, which persisted despite vitamin K administration. This fact could be attributed to physiological hypoprothrombinemic state of premature neonates or due to co-existing sepsis for which the neonates required antibiotic therapy. Multiple confounding factors might result in vitamin K deficiency – prematurity, class of antibiotics administered and sepsis [3]. Antibiotic administration might have worsened the pre-existing vitamin K deficiency, which did not respond to single intramuscular dose of vitamin K. In the presence of pre-existing PIVKA 2 levels > 2 ng/mL in both the groups, the safety and efficacy of intramuscular route needs to be addressed.

It was mentioned that median postnatal age at enrolment was 10.5 days (vitamin K group) and 10 days (no vitamin K group) with IQR of 9-18 days in both the groups. As it was presented that early onset sepsis (sepsis within 72 hours of life) occurred in 58.5% of vitamin K group and 41% of no vitamin K group, which seems contradicting the age of enrolment [4]. PIVKA 2 levels can also be increased in other co-morbid conditions like cholestasis, neonatal giant cell hepatitis, whose evaluation may be necessary [5]. However, this study being the first of its kind in neonates, forms a platform for future research.

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