

LATE ONSET VITAMIN K DEFICIENCY BLEEDING, EXTREME PREMATURITY AND A HUMAN MILK BASED DIET

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- An extremely preterm female infant (born at 23⁺⁵ weeks; weight 555g) received 0.4mg/kg IM Vitamin K1 (VK). She received an exclusively human milk-based diet and was commenced on a commercially available human-milk fortifier.
- On D73 (CGA: 33⁺⁶ weeks; weight 1521g) she had significant 'oozing' from a heel-prick site. Investigations demonstrated deranged coagulation. She was treated with IM VK followed by oral VK thereafter.
- After 3 days, her coagulation normalized. **PIVKA-2 analysis confirmed the diagnosis of late-onset VKDB.** The results are illustrated in Figure 1 (abnormal values in red).

RECOMMENDED DAILY VITAMIN K REQUIREMENT?

- The current recommendation for VK is 8-10 µg/day in VLBW infants & 5µg/day in healthy breastfed infants (0-6 months) (ESPGHAN 2016).
- **Exclusive human milk diets have lower VK content compared to preterm formula diets.** Further, human milk fortifiers (HMF) are known to have lower VK content compared to Cow's Milk fortifiers.
- Our baby received exclusive HMF which contained 0.3µg/100ml VK (approximately 20 times lower than compared to a cow's milk fortifier). (1)

WHAT IS PIVKA-2?

- Protein induced by Vitamin K absence, under carboxylation = **PIVKA-2 is a functional marker of overall hepatic VK status.**
- An elevated PIVKA-2 (>50.9mAU/ml) indicates a VK deficiency.
- Serum VK is a marker for overall body tissue stores of VK but unreliable for diagnosis of VKDB.
- Normal Serum VK is 0.15 - 1.55 µg/L. (2)

BLOOD RESULTS (Figure 1)

Test	D73 (Day of diagnosis)	D76	D77	D93 (Post treatment)	Ref range
PT	149.8		12.9		12-16s
APTT	84.4		39.5		22-25s
Factor VIII	137				50-100 IU/dl
Factor IX	7				60-150 IU/dl
Factor XI	48				70-160 IU/dl
PIVKA-2		13437.2		28.02	17.36-50.0 mAU/mL
VK		40.12		3.44	0.15-1.55 ug/l

CONCLUSIONS

Preterm babies fed an exclusively human milk-derived diet (including HMF) receive inadequate VK intake and therefore maybe at risk of VKDB without additional VK supplementation.

