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Vitamin A levels and feeding practice in neonates with and without chronic lung disease

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1 Introduction

Vitamin A is essential for the differentiation and function of normal tissue and repair after injury. Recent studies have reported an association between vitamin A deficiency and chronic lung disease (CLD) in preterm infants [7, 11]. Two studies have demonstrated that infants with chronic lung disease require prolonged intravenous nutrition [7, 11]. It is therefore tempting to speculate that poor supplementation, while such infants remain nil by mouth, is the most likely explanation for the association of vitamin A deficiency and CLD. Although this hypothesis was supported by data from one study [11], it was contradicted by a second [7] which suggested infants with CLD actually receive more vitamin A than those without CLD [7]. HUSTEAD et al [7] suggested other mechanisms than inadequate administration of vitamin A should be considered to explain the association of CLD and low vitamin A levels; such as lack of mobilisation of retinol from hepatic stores, higher needs or more rapid utilisation of vitamin A in infants with CLD. If those suggestions are correct [7], infants at risk of developing CLD would require higher levels of vitamin A supplementation. Vitamin A supplementation, however, may be hazardous, as toxic levels result in non-specific neurological problems [4, 5]. We therefore felt it very important to further elucidate the mechanism of low vitamin A levels in infants with CLD. The aim of this study was, in infants who did and did not develop CLD, to

assess vitamin A intake and levels achieved during routine clinical supplementation and to relate these to feeding practice.

2 Patients

Twenty-eight infants were recruited into the study, 14 with CLD and 14 controls without CLD. The median gestational age of the CLD infants (10 males, 4 females) was 26 weeks (range 24–30) and birthweight 836 gms (642–1290). The median gestational age of the controls (7 males, 7 females) was 28 weeks (range 25–31) and birthweight 990 gms (560–1404).

This study was approved by the King's College Hospital Ethics Committee.

3 Methods

At King's College Hospital vitamin A levels are measured routinely on a weekly basis in infants whose birthweight is less than 1500 gms and gestational age less than 32 weeks. Blood for vitamin A analysis was taken into microtainer serum separator tubes (Microtainer – Becton Dickinson Ltd) and then centrifuged within 48 hours. The serum was stored at -20°C until analysis was performed within one week. 100 μl amounts of serum were analysed for retinol alcohol (vitamin A) by using a modified method of CATIGNANI & BIERI [1]. Retinyl acetate (5–6 $\mu\text{mol/l}$) in ethanol, con-