Correspondence

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Breast Milk Bilirubin Conjugation Inhibitors in Neonatal Hyperbilirubinaemia

Sir,

We were interested to read the observations of Cole and Hargreaves (1972) on Conjugation Inhibitors and Early Neonatal Hyperbilirubinaemia. We, also, were unable to find a correlation between the serum bilirubin concentration in breastfed, 6-day-old infants and conjugation inhibitors in the mother's milk (Arthur, Bevan, and Holton, 1966). However, it would be wrong to conclude that breast feeding is not a factor determining early neonatal bilirubin levels. Our studies and those of Stiehm and Ryan (1965) have suggested that breastfed infants tend to have higher serum bilirubins and an increased incidence of clinical jaundice. It may be that conjugation inhibitors play no part in this, or it is possible that milk inhibitor levels, measured with an adult rat liver slice system, are not altogether relevant to the situation in the human newborn infant's liver.

The validity of *in vitro* measurements of bilirubin conjugation inhibitors is also in question because of the increased activity of the milk samples on storage. We found that this occurred to a significant extent in only a few milks, but we have elucidated the mechanism of this effect (Bevan and Holton, 1972). The enhanced inhibitory activity in stored milk correlated with an increased concentration of free fatty acids. On fractionation of the milk, using thin-layer chromatographic techniques, the inhibition was found in the free fatty acid zone. We have shown pure free fatty acids to be potent inhibitors of bilirubin conjugation in rat liver slices, probably by affecting glucuronyl transferase.

Prolonged jaundice in infants, caused by breast feeding, was originally described by Arias *et al.* (1964). It was concluded that this was due to the presence of pregnane-3 α ,20 β -diol in the milk, and this interfered with bilirubin metabolism in the infant's liver. Other workers (Ramos, Silverberg, and Stern, 1966) have failed to find pregnane-3 α ,20 β -diol in what they believed to be inhibitory milk, and theoretical objections to this steroid being the cause of prolonged neonatal jaundice have been put forward (Adlard and Lathe, 1970; Hargreaves and Piper, 1971). The possible role of free fatty acids in this condition has to be considered. It would be anticipated that the mature infant could handle some dietary excess of fatty acids, administered in either the free or esterified form, but it

is possible that, during the first few weeks of life, these could accumulate and inhibit bilirubin conjugation in the liver.

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Cystic Fibrosis Care—Further Considerations

Sir,

In describing the prevention of pulmonary complications in cystic fibrosis patients at Queen Elizabeth Hospital for Children, instituted by Dr. Winifred F. Young and carried on so capably by Dr. Mearns (Mearns, 1972), Dr. Mearns states that we have claimed an improved lifespan in our series of patients (Warwick and Monson, 1967) due to the introduction of mist tent therapy. Dr. Lawson, in his annotation (Lawson, 1972), questions the need for mist tent therapy.

In 1967 we reported improved pulmonary function with mist tent therapy using several groups of cystic fibrosis patients as their own controls. We still feel that