malignant hyperthermia, may offer an effective treatment.[5 6]

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Oral administration of active vitamin D metabolites to low birthweight infants

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SUMMARY The active vitamin D metabolites 1α,25-dihydroxycholecalciferol (Rocaltrol) and the analogue 1α-hydroxycholecalciferol (One-Alpha) are adequately absorbed after oral administration in the preterm infant. The absorption pattern is similar to that seen in adults.

Bone demineralisation is common in low birthweight preterm infants, with a reported incidence of up to 32%. Vitamin D metabolites are prescribed in the management and prophylaxis of early onset hypocalcaemia and rickets.[1 2] There is little information available on the absorption and acute metabolic effect after oral administration of these metabolites to preterm infants. We report on 10 low birthweight preterm infants who received an equivalent oral dose of 1α,25-dihydroxycholecalciferol (Rocaltrol, Roche Products, Herts, United Kingdom) or 1α-hydroxycholecalciferol (One-Alpha, Leo Laboratories, Bucks, UK).

Patients and methods

Two groups of five infants (two boys and three girls each) were studied. Group 1, who had a median gestational age of 28 weeks (range 27–29 weeks) and birth weight of 1210 g (range 840–1360 g), received 0·1 μg/kg of One-Alpha at a median postnatal age of 4 weeks (range 3–5). Group 2, who had a median gestational age of 28 weeks (range 27–30 weeks) and birth weight of 1110 g (range 870–1200 g), received 0·1 μg/kg of Rocaltrol at a median postnatal age of 4 weeks (range 3–5 weeks).

Both agents were prepared according to the manufacturer's protocol and given as a single morning oral dose. At the time of investigation the feeding regimens in both groups were identical; two infants in both were receiving expressed breast milk, two mixed feed, expressed breast milk, and standard formula feed, and one standard formula feed alone. No infant had clinical, biochemical, or radiological evidence of bone demineralisation or of hypocalcaemia.

Blood (1·5 ml) was collected by venepuncture immediately predose and at six and 24 hours postdose. It was not considered ethically correct to take additional samples at other times. The first postdose sample time of six hours was chosen to approximate to the peak absorbed concentration time as based on available data from adults.[3]

Blood was separated within half an hour of collection and the plasma aliquoted and stored frozen at −20°C till assayed. Plasma 25-hydroxycholecalciferol and 1α,25-dihydroxycholecalciferol concentrations were assayed in duplicate by competitive protein binding after sephadex column separation by the method of Mallon *et al.*[4] Individual patient samples were analysed within the same assay batch. The interassay coefficient of variation for 25-hydroxycholecalciferol was 11% while for 1α,25-dihydroxycholecalciferol it was 12%. Plasma calcium concentration was assayed by a manual

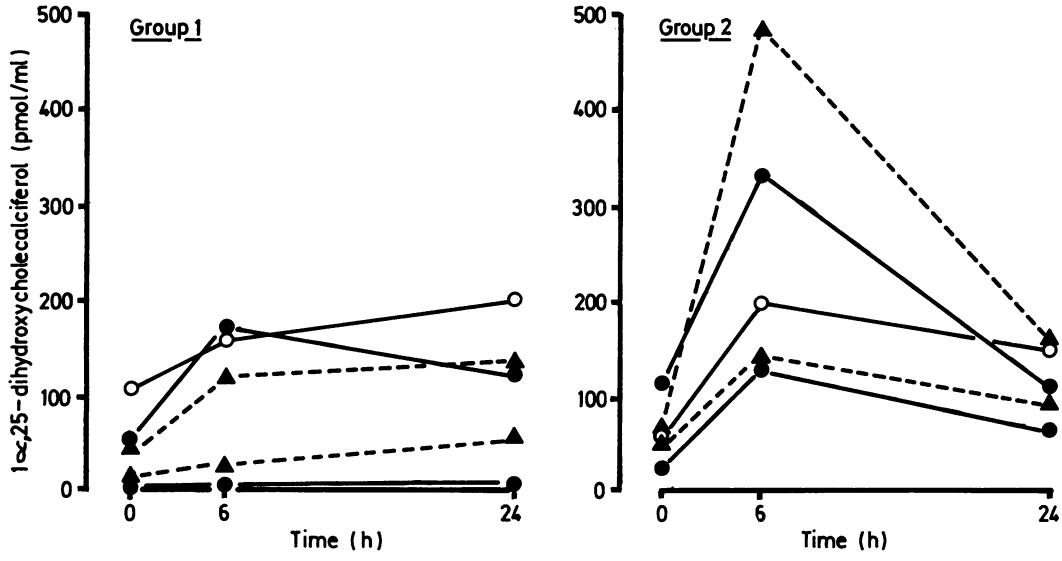

Figure *Serial changes in plasma 1α,25-dihydroxycholecalciferol concentrations after oral administration of 1α-hydroxycholecalciferol (group 1) and 1α,25-dihydroxycholecalciferol (group 2). Feeding regimens at the time of study are as follows: ●——●=expressed breast milk; ▲ - - - ▲=mixed feed, expressed breast milk, and standard formula feed; ○——○=standard formula feed.*

cresolphthalene complexiметric method with an intra-assay coefficient of variation of 2% and plasma inorganic phosphate concentration by a manual molybdate reduction method with an intra-assay coefficient of variation of 4%. Statistical analysis of all biochemical variables was performed using the Mann–Witney U test. The study was approved by the hospital ethical committee, and informed consent was obtained.

Results

The median and range of the predose plasma 1α,25-dihydroxycholecalciferol concentration and the median incremental increase above this basal concentration at six and 24 hours are shown in the Table. There was no significant difference between the predose concentrations of the two groups. In group 1 there was a sequential increase in plasma 1α,25-dihydroxycholecalciferol concentrations over the 24 hours, but this increase was not significant. In group 2, however, there was a significant increase at six hours ($p<0.01$), which returned towards the predose concentration at 24 hours (Figure).

Table *Incremental increase above predose concentrations of plasma 1α,25-dihydroxycholecalciferol in two groups treated with vitamin D metabolites. Values are median (range)*

	Plasma 1α,25-hydroxycholecalciferol (pmol/ml)		
	Predose concentrations	*Incremental increase over predose concentrations*	
		6h	*24h*
Group 1 (One-Alpha)	48 (6·5–108)	58 (16–118)	65 (8–95)
Group 2 (Rocaltrol)	60 (22–118)	134 (79–421)	56 (37–96)

Two infants in group 1 showed a net negative change in 25-hydroxycholecalciferol, whereas three infants in group 2 showed a similar change. At 24 hours all infants in group 1 and two in group 2 showed a net positive change. The changes were not significant, however, at either time.

There was no significant change in plasma calcium or inorganic phosphate concentration in either group at six or 24 hours.

Discussion

With the availability of more potent vitamin D metabolites or analogues, these agents have been increasingly prescribed both in the adult and in the infant for metabolic conditions associated with altered vitamin D metabolism. They have a number of therapeutic advantages over the parent com-

pound cholecalciferol or ergocalciferol, in that they may not require in vivo hydroxylation within the liver and kidney for activation. This may be important in the preterm infant where a maturational delay in the renal enzyme 1α hydroxylase pathway has been implicated[5] as one of the factors associated with the complex condition of rickets of prematurity. As the metabolites have an enhanced biological activity with a shorter half life compared with the parent compounds, the dose-response relation may be more easily controlled. The routine use of these agents in the prophylaxis or management of rickets of prematurity is, however, disputed.[6]

This study shows, for the first time, that 1α,25-dihydroxycholecalciferol (Rocaltrol) is adequately absorbed after oral administration and has a similar kinetic profile to that observed in adults.[3] The precise timing of the peak concentration is uncertain as frequent blood sampling was not considered ethically justifiable in these infants. The gradual and persistent rise in plasma 1α,25-dihydroxycholecalciferol concentration after the oral administration of One-Alpha suggests that this analogue was also absorbed and subsequently underwent liver 25-hydroxylation. Whether 25-hydroxylation is necessary for maximal biological activity of One-Alpha is uncertain (Leo Laboratories. Personal communication).

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Chlamydia trachomatis as a cause of neonatal conjunctivitis

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SUMMARY *Chlamydia trachomatis* was identified in 37 of 73 consecutive neonates with purulent conjunctivitis, including four delivered by caesarean section with intact membranes. Most (28/37) presented in the first week. Infection was significantly associated with referral from the community. Genital *C. trachomatis* infection was present in 13 of 35 parents of affected infants.

Neonatal purulent eye discharge is common. British studies in 1977[1] and 1982[2] and a recent Danish report[3] have given rates of 8·4%, 12%, and 25%, respectively.

Bacterial pathogens were isolated in 33% of cases in the British study of 1982[2] compared with 26·6% in an American series[4] in which *Chlamydia trachomatis* was isolated in a further 29·5% of cases as against 3% in the 1982 British study[2] and none in the 1977 study.[1]

Because *C. trachomatis* has been increasingly identified in the Camberwell Health Authority as a cause of pelvic inflammatory disease and non-specific and non-gonococcal genital infection[5] we have studied the pattern and causes of neonatal conjunctivitis in our area. Parents of neonates with chlamydial or gonococcal conjunctivitis were investigated for genital infection.

Patients and methods

From August 1984 to January 1985 consecutive neonates with purulent conjunctivitis were recruited from the postnatal wards of King's College and Dulwich Hospitals, the neonatal intensive care unit,