sphingolipids required for brain growth and development, and for many other galactosides. The galactose is incorporated into these compounds through the cofactor UDPGal. In a normal or transferase-deficient individual, UDPGal can be synthesised even when galactose intake is restricted. This is achieved from glc-1-P by reversal of the pyrophosphorylase pathway. The patient, who is believed to have an epimerase deficiency, is unable to make UDPGal by this means and is dependent on galactose for its synthesis. Therefore, while her galactose intake has to be restricted to prevent acute symptoms developing, it is essential that she has some dietary galactose to allow UDPGal and galactoside synthesis.

Since age 4 months the patient has been maintained on a galactose intake of 1.5 g daily. On this regimen the red blood cell gal-1-P is about zero and the UDP galactose has fallen to 55 $\mu\text{mol/l}$ (3.1 mg/100 ml). However it is not clear whether the circulating red cell is a good indicator of the availability of UDPGal in all tissues. Her developmental progress is causing some concern since she did not smile until 8 weeks of age and at 6 months her development was only at a 4-month stage.

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Umbilical care and cord separation

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SUMMARY Four different treatments for the care of the umbilical cord were compared in a randomised, controlled study. Triple dye was associated with a significantly earlier separation of the cord than either 1% neomycin or 1% silver sulphadiazine ointment, and it was nearly as effective as bismuth subgallate (an astringent powder) in causing rapid sloughing. If the mother is made aware that care of the umbilical cord may delay cord separation she may be spared unnecessary concern.

A delay in the separation of the umbilical stump is often a cause of maternal concern; such concern can often be prevented if a proper explanation is given. New methods of treating the umbilical cord

are now used in the control of neonatal bacterial colonisation.^{1 2} Four different types of treatment were compared in order to find out what advice should be given to the mother.

Subjects and methods

Healthy, appropriate-for-gestational age, term infants, who had been admitted to our nursery between January and July 1980, were each randomly assigned to one of four treatment regimens. Informed parental consent was obtained. The four regimens were:

- (1) Triple dye (brilliant green, 2.29 g; proflavine hemisulphate, 1.14 g; crystal violet, 2.29 g; and sufficient water to make 1000 ml).

Table Age (days) of umbilical cord separation*

	Triple dye			1% Neomycin			1% Silver sulphadiazine			Bismuth subgallate		
	Caesarean (n=15)	Vaginal (n=21)	Total (n=36)	Caesarean (n=9)	Vaginal (n=17)	Total (n=26)	Caesarean (n=13)	Vaginal (n=12)	Total (n=25)	Caesarean (n=15)	Vaginal (n=19)	Total (n=34)
Age (days)	7.8±1.1	7.6±0.6	7.7±0.6	13.1±1.6	11.3±1.0	12.0±0.8	11.1±1.3	10.1±1.0	10.6±0.8	6.5±0.6	6.4±0.4	6.4±0.3
Weight (kg)	3.1±0.1	3.2±0.1	3.2±0.1	3.1±0.2	3.4±0.1	3.3±0.1	3.1±0.1	3.2±0.1	3.1±0.1	3.1±0.1	3.3±0.1	3.2±0.1

*All values are mean ± SEM.

- (2) 1% Neomycin ointment.
- (3) 1% Silver sulphadiazine ointment.
- (4) Bismuth subgallate powder, an astringent agent.

After admission to the nursery each newborn infant was bathed with 3% hexachlorophane followed by a daily bath with soap. After the bath, the infant was immediately rinsed with water. The umbilical cord was tied by a rubber band 1 cm above the skin and the treatment agent was applied once daily to the umbilicus and the adjacent skin until he was discharged. Upon discharge each mother was told to continue the umbilical care with alcohol applications until the cord separated and to note the date of such separation.

The average stay in the nursery was 3 days for vaginally-born infants and 9 days for infants delivered by caesarean section. Any baby who was receiving phototherapy or who developed complications during his stay in hospital was excluded from the study.

Results

The results are summarised in the Table. There was no appreciable difference in the time it took for the stump to separate between infants delivered vaginally and those delivered by caesarean section. Therefore both groups were combined so as to compare each treatment regimen.

There was no significant difference ($0.05 < P < 0.1$) between the bismuth subgallate powder and the triple dye for the time it took for the cord to separate. Each of these agents was associated with a significantly ($P < 0.005$) earlier separation than 1% neomycin or 1% silver sulphadiazine ointment. There was no significant difference between the effect of the other two agents ($0.25 < P < 0.3$). No case of sepsis or other umbilical complication was noted during the period of the study. Bacteriological data were not obtained.

Discussion

Although most textbooks of paediatrics suggest that the umbilical stump falls off between the 6th and 14th day^{3 4} no study appears to have recently been undertaken. In the present study the average time for separation was between 1 and 2 weeks, which agrees with the earlier observations. It was shown that care of the umbilical cord has an effect on the length of time taken for the cord to separate. Both antimicrobial ointments prolonged the time before separation, probably because they slowed down the drying and necrotising processes. Triple dye, on the other hand, was nearly as effective as the astringent powder in causing earlier sloughing of the cord. Care of the umbilical cord is mainly carried out in order to prevent sepsis, and the effect on stump separation should only be a secondary factor when considering umbilical treatment. However, the knowledge of this effect may help to prevent unnecessary parental concern.

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