Complications of Nasojejunal Tube Feeding

C. T. FERNANDES, M. D. MANN, J. WOLFSDORF

SUMMARY

The frequency and duration of complications were compared in premature babies fed by nasojejunal and nasogastric tubes. Some factors may have weighted the results against the nasojejunal tube-fed group, but this study failed to demonstrate differences in the rate and duration of complications.


Many small premature babies have to be fed by tube and there are a number of papers on the advantages of nasojejunal tube feeding. However, there are also several reports of complications such as abnormal bacterial colonisation of the small bowel, diarrhoea, intussusception, perforation, necrotising enterocolitis, bleeding and septicaemia. This article reports the frequency and duration of these complications in 27 matched pairs of premature babies of appropriate weight for gestational age, one member of each pair being fed by nasojejunal tube and the other by nasogastric tube.

PATIENTS AND METHODS

The babies were matched on the basis of weight and the mean of the 1- and 5-minute Apgar scores. Weight was taken in increments of 100 g, i.e. 1 000 - 1 099, 1 100 - 1 199, etc. up to 1 599 g, and the mean Apgar scores in increments of 3, i.e. below 4, 4 - 6, and more than 6.

All tubes (Argyle premature infant feeding tubes AR-33R, 5Fr) were passed into the jejunum or the stomach without screening within 72 hours of birth, and the position of the tubes was checked by aspirating bile or gastric juice before each feed. The babies were fed aliquots of boiled expressed breast milk every 3 hours. The volume given each day was increased by approximately 20 ml/kg until the babies in the group fed by nasogastric tube were receiving 180 ml/kg/day and those in the group fed by nasojejunal tube were receiving 200 - 240 ml/kg/day. The tubes were removed as soon as the babies were able to suck and maintain a weight gain of 25 - 30 g per day. All complications during and following the period of tube feeding were noted, with diarrhoea being arbitrarily defined as one watery stool, or a stool containing mucus and/or blood, or four or more loose stools.

RESULTS

No complications other than diarrhoea were observed in any of the babies. Twelve of the group with nasogastric tubes and 15 of the group with nasojejunal tubes developed diarrhoea ($P > 0.1$) but pathogens (E. coli 086/7 and 080/87) were isolated in only 2 cases, one from each group. In the group with nasogastric tubes diarrhoea started between the 5th and the 23rd day of life (median 15 days) and in the group with nasojejunal tubes, between the 4th and the 24th day of life (median 10 days) ($P > 0.1$). The total duration of diarrhoea was between 1 and 6 days in the group with nasogastric tubes (median 5 days) ($P = 0.1$) and between 1 and 6 days in the group with nasojejunal tubes (median 4 days). Two babies in the group with nasojejunal tubes, one of whom died, suffered from necrotising enterocolitis ($P > 0.1$).

The frequency of diarrhoea was not related to birth weight in either of the two groups, or when both groups were combined ($P > 0.1$). Diarrhoea was more frequent in babies who had mean Apgar scores of 6 or less than in those with mean Apgar scores greater than 6; 12 (6 from each group) of the babies with lower Apgar scores developed diarrhoea ($x^2 = 4.35, P > 0.05$).

DISCUSSION

Several factors may have been responsible for the high incidence of diarrhoea. Babies may have been infected by the medical staff, or by the mothers who feed, clean and handle them, and who are a significant reservoir of bacterial pathogens. However, pathogens were only isolated from the rectal swabs of 2 of the 27 babies (7.4%) who developed diarrhoea, and isolation rates are usually much higher when infective gastro-enteritis reaches epidemic proportions. Abnormal colonisation of the small bowel by non-pathogenic bacteria may also have been responsible, but if infection and colonisation were the only explanations, it is likely that the frequency of diarrhoea in the group with nasojejunal tubes would have been much higher than in the group with nasogastric tubes, since the nasojejunal tube provides a direct route for bacterial invasion. Another possibility is that abnormal colonisation may occur when a nasogastric tube is left in place for several days, particularly when babies are fed on boiled expressed breast milk, but this method of feeding has not been associated with a high incidence of gastro-enteritis in the past.

Low Apgar scores appear to have been a factor in 12 of the 27 patients who developed diarrhoea. Arterial hypoperfusion of bowel is a potent cause of enterocolitis in low-birthweight babies.

In an attempt to get optimum weight gain, babies were fed as much as possible. This might in itself result in
stools being softer than usual. However, this factor, like abnormal bowel colonisation and infection, would tend to increase the incidence of 'diarrhoea' in babies fed by nasojejunal tube, as they received larger feeds than those in the nasogastric group. The definition of diarrhoea may also have been too strict. The differentiation of loose stools from the normal soft pasty stools of babies fed on expressed breast milk is subjective, and the high incidence of diarrhoea is probably apparent, rather than real.

Although some of the above factors may have weighted the results against nasojejunal tube feeding, this study failed to demonstrate any difference in the rate of complications found in babies fed by nasojejunal tube and in those fed by nasogastric tube.

REFERENCES


A Full-Term Fetus with Holo-acranial Anencephaly and Other Abnormalities

H. LEVY

SUMMARY

A fetus with no head or neck was dissected in order to trace possible remnants of those structures. Many other abnormalities were also displayed. Mechanisms of anencephaly are discussed, especially those which probably caused this malformation.


Anencephaly is a congenital malformation of the rostral end of the central nervous system and is characterised by the absence of the telencephalon, diencephalon and occasionally the mesencephalon. The condition is incompatible with postnatal life and specimens are usually stillborn or shortlived.

The fetus described in this article was from the Johannesburg area, but of unknown history. It was acquired by the Anatomy Department of the University of the Witwatersrand and entrusted to me for study.

OBSERVATIONS

External Features

The fetus was morphologically female. The 'crown'-rump length was 21 cm and 'crown'-heel length 32 cm. The fetus weighed 1210 g after preservation in 10% formalin. Skin covered the entire fetus and no scalp hair was found. From the anterior aspect there was no evidence of a head or neck (Fig. 1). The posterosuperior aspect bore the common opening of the oesophagus and trachea. Slightly inferior to this opening was a scar-like region which represents the fusion of the rhombencephalon and spinal cord with the skin (Figs 2 and 3). The left shoulder region bore a flap of undifferentiated tissue, representing displaced head elements. The fetus was club-footed and had a hyperflexed right wrist.

Radiological Features

The fetus was full-term, as determined by the presence of the proximal ossification centre of the tibia (Fig. 4). There were no cranial elements. The cervical spine exhibited retroflexion. The ribs on the right side were abnormal in that they did not completely embrace the thorax (Fig. 4).