acids, as well as the phenylalanine concentrations and the transport characteristics of the blood-brain barrier. Although we know rather little about the latter in sick, human infants, comparison of the ratios of phenylalanine to the sum of the concentrations of tyrosine, tryptophan, and the branched chain amino acids in infants receiving breast feeds, Vamin 9 glucose, and Vaminolact provides a comparative measure of phenylalanine uptake in the three groups of infants.

Using the average plasma amino acid values in breast fed infants[4] and in those given Vamin 9 glucose and Vaminolact[1] the ratios were 0·1, 0·35, and 0·27 respectively. The data suggest that phenylalanine uptakes into the brain in infants receiving Vamin 9 glucose and Vaminolact were similar, and that both products are likely to result in higher uptake of phenylalanine than breast feeding. In those infants receiving Vamin 9 glucose who had particularly high phenylalanine concentrations the ratio would be higher only if the concentrations of tyrosine and other amino acids failed to rise with phenylalanine. The increased ratio in infants receiving Vaminolact was largely accounted for by their lower tyrosine concentrations, and the ratios of tyrosine to the other large neutral amino acids (0·2, 0·2, and 0·06 respectively) suggest that tyrosine uptake was lower in infants receiving Vaminolact than in breast fed infants; in infants receiving Vamin 9 glucose it was similar. However, if tryptophan is considered the reverse situation pertains (ratios 0·13, 0·04, and 0·12 respectively).

These simplified ratios cannot be expected to give an accurate prediction of brain amino acid uptake but do provide useful comparisons. In the present state of knowledge it seems wisest in infants receiving intravenous amino acids to aim at plasma amino acid profiles similar to the averages observed in well nourished breast fed neonates. By this criterion Vaminolact requires the addition of tyrosine (and a reduction of threonine) before it can be said to be 'better' than Vamin 9 glucose.

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Drs Puntis, Ball, Preece, et al comment:
We thank Dr Smith both for her remarks on our paper and her interesting speculations. While we do not disagree with her comments, there are several points which should be raised in reply. We do feel that when examining available amino acid sources it is reasonable to focus attention on those amino acids such as phenylalanine that under certain circumstances are known to have deleterious clinical effects at high concentrations. Our data allow for certain generalisations to be made when comparing the two amino acid solutions, but we fell that Dr Smith is rather brave to make inferences about phenylalanine uptake by the brain in our patients. We did not conclude that Vaminolact is preferable to Vamin 9 glucose simply because it was associated with less marked increases in plasma phenylalanine, but because, in general, the plasma concentrations of the various amino acids (including phenylalanine and tyrosine) in Vaminolact fed infants tended to be closer to the mean described in breast fed infants than those in the Vamin 9 glucose fed group. By this criterion Vaminolact appears 'better' than Vamin 9 glucose. Whether or not we should be attempting to reproduce the amino acid profiles found in breast fed infants is a moot point and the ideal composition for amino acid sources remains a subject for debate.

Aneurysms of the vien of Galen

SIR,—We would like to add a small but important point to the discussion of aneurysms of the vein of Galen by O'Donnabhain and Duff.[1] We would agree that surgery for the aneurysm itself is both difficult and seldom successful but may be a necessary part of the management of the infant with high output cardiac failure. Infants with hydrocephalus comprise a different clinical group who should undergo shunting as the initial surgical procedure. Having stabilised these patients with hydrocephalus it is important to be aware that further surgery may not be necessary as there are a number of cases in the literature in which the aneurysm has subsequently undergone spontaneous thrombosis.

All the reported cases of a thrombosed aneurysm of the vein of Galen presented initially with hydrocephalus, although one case presented with subarachnoid haemorrhage in addition to hydrocephalus. Spontaneous thrombosis does facilitate the successful surgical removal of the aneurysm, the first such case being a 5 month old boy described by Heinz *et al.*[2] Calcification of the aneurysm occurs in 14% of patients and the aneurysm may calcify completely. We have recently described a 3 month old boy with hydrocephalus whose aneurysm of the vein of Galen was completely thrombosed and calcified by 3 years.[3] We now consider him 'cured' after ventriculoperitoneal shunting only and we would advocate that early surgery, if possible, be confined to the treatment of hydrocephalus.

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