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Nutritional status of Asian infants

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Although the present discussion is the result of observations on Pakistanis living in Bradford, the Asian immigrants in this country come from both India and Pakistan. However, there is no reason to believe that Indian immigrants differ appreciably from Pakistani immigrants in their food habits and nutritional status, or that the Bradford residents are different in these respects from those living in other parts of this country.

In 1953 there were in Bradford about 350 coloured immigrants, but in the census of 1961 the count was over 5000 and nearly as many again arrived between May and August 1962. At first nearly all the Asians were men between about 20 and 45 years of age, but during 1963 an increasing number of wives and families began to arrive. In 1963 about 300 Pakistani and 300 Indian children were attending school in Bradford and about 150 coloured children were being born each year in the city. The size of the Asian population is still increasing owing mainly to births in this country. The proportion of births occurring in Asian families increased from less than 4% of the total births in Bradford in 1963 to over 8% in 1965, in which year over 500 babies were born into Asian families.

The history of the growth of the immigrant population suggests that the nature of nutritional problems may have changed over the past few years. The state of health in the past would have been influenced by dietary habits and environmental factors which had operated in Pakistan; recently those most liable to nutritional defects, namely mothers during pregnancy and lactation and children during the 1st year or so of life have been subjected exclusively to conditions in an urban location in this country. The results of earlier observations may not therefore be similar to those of inquiries being made now. Of particular importance is the fact that during pregnancy Pakistani mothers in this country benefit from the obstetric services which they are using conscientiously. At the same time they are, perhaps, being influenced by commercial advertising and other ways in their choice of foods for themselves

and their families. The fact that similar influences also exist in parts of Pakistan should not be overlooked; apart from climatic conditions the Pakistani mother in this country is being subjected to influences which are common to urban communities anywhere including England and Pakistan itself. One result of the situation is a decline in the avoidance of certain foods during pregnancy, a fairly common practice in rural areas of Pakistan.

In Bradford many Pakistani infants are bottle-fed (Dolton, 1966) and the mothers seem to follow the advice about artificial feeding given in the health centres. Variation in the accuracy with which preparations of milk are reconstituted is to be expected, and instances of excessive dilution were in fact revealed by the analysis of samples of infant feeds taken after their preparation in households (Fig. 1). If no other foods are being given at the same time, overdilution of feeds leads to an inadequate intake of calories, protein and other nutrients since feeds are given not according to their

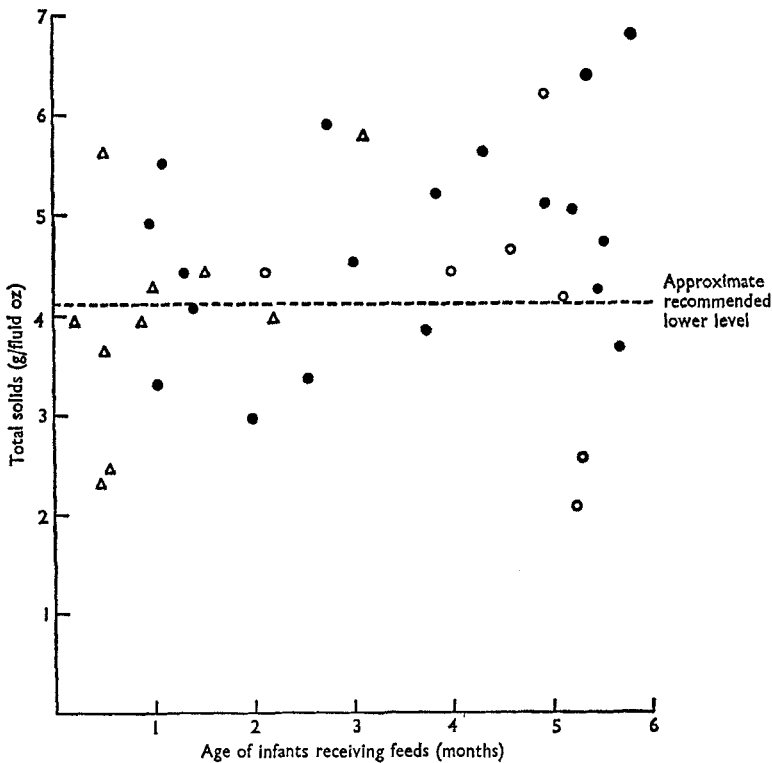


Fig. 1. Concentration of solids in samples of mixtures which had been prepared in some Bradford households for feeding Pakistani (●), Indian (○) and English (△) infants.

content of solids but to their fluid volume. However, there is no reason to suppose that this hazard is any more common among Pakistanis than among the English. Both in the present and in previous inquiries (Hyttén & MacQueen, 1954; Bransby

& Kellett, 1957) evidence was found of appreciable variation in food intake by English infants through this cause.

Another possible cause of a nutrient deficiency is lack of exposure of infants to sunlight. Pakistanis do not intentionally allow young children to be exposed out of doors, and owing to the climatic conditions of this country, together with the reluctance of Pakistani mothers to leave their houses, their infants might be in greater danger of developing a deficiency of vitamin D than are English children. However, accounts of rickets in Asian infants are not available, although Dunnigan, Paton, Haase, McNicol, Gardner & Smith (1962) found the condition in a few older children who had been living in Glasgow for several years. Vitamin D deficiency was not expected to occur in infants born in Bradford because of the widespread use of supplements provided by the health service and the common use of foods enriched with the vitamin.

Anaemia, possibly due to dietary deficiency, has been described among immigrants living in Bradford, and Dr G. Warnes (personal communication) showed some years ago that during the 1st year of life the average haemoglobin level of Asians fell progressively below that of English infants. Recently, in collaboration with Dr Warnes, we have commenced a new series of haematological measurements. So far in over fifty infants tested only two were found to be anaemic, both having a haemoglobin level of about 9 g/100 ml.

On the average, birth weights and body-weights at the end of the 1st year of life are both less in Asians than in English infants in Bradford (Aykroyd & Hussain, 1967). However, the average rate of change in weight of Asian and English infants is the same, and the difference between average weights of the two racial groups during infancy is a continuation of that which already existed at birth. If the smaller size of the Asians during infancy is indicative of a lower plane of nutrition compared with that of English infants the factors contributing presumably operated before birth, that is during foetal development. The diet of the Pakistani infant is apparently adequate to maintain a normal rate of growth in weight relative to birth weight.

Dolton (1966) drew attention to the relatively high mortality rates among coloured children in Birmingham and Bradford. The main difference in the mortality rates of different racial groups is seen in the early neonatal period; this is to say during the 1st week after birth (Douglas, 1965). Infant deaths among the Bradford community as a whole are attributed most commonly to pneumonia and prematurity; congenital abnormalities contribute about 11% of all deaths which occur during the 1st year of life.

Although a specific diagnosis for cause of death is usually made, in this country an appreciable number of deaths which occur very early in life remain unexplained (Butler & Bonham, 1963; Ministry of Health, 1965). Furthermore many pathologists agree that the specific diagnosis given does not always explain fully the reason for death. Much interest is now being taken in prenatal influences which contribute to survival at and soon after birth, the physical state of the newborn, and the subsequent growth and development of the child. Perhaps the most important of these influences is the nutrition of the foetus. If there are nutritional and other physical

differences between the offspring of Asian parents living in this country and those of English parents we concluded that they would most probably be found to originate during intra-uterine life. Accordingly an inquiry has been started in which the physical characteristics of the body and the amounts of some nutrients in the liver are being measured in the bodies of English and Pakistani infants dying in the perinatal period. Some of the first results of the inquiry are reported here.

Because weight at birth depends on gestational age and also on the nutritional state of the foetus, premature birth and poor nutrition both result in relatively low birth weight but the two situations can be differentiated (Wigglesworth, 1965). The poorly nourished foetus has a relatively small liver which is revealed by comparing its weight with that of the brain, an organ which seems to grow normally in size in these circumstances (Gruenwald, 1963; Dawkins, 1964). The ratio, weight of brain:weight of liver (B:L ratio) is high in foetal malnutrition compared with that in infants who are normal at birth, including those born prematurely. Analysis of over sixty bodies of infants dying in Bradford and London at or soon after birth showed that an appreciable number had a B:L ratio higher than an arbitrary normal standard (Fig. 2).

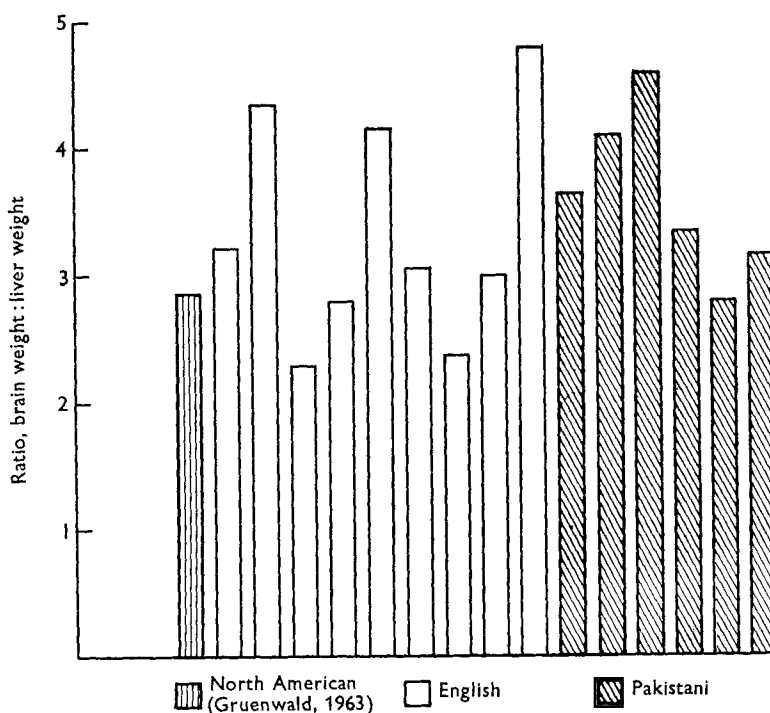


Fig. 2. Brain weight in relation to liver weight in some English and Pakistani babies who died in the perinatal period, compared with presumably normal infants. Each column, except that for North Americans, represents one child; all were born at a gestational age between 34 and 40 weeks.

When gestational age was normal, or nearly so, a high B:L ratio seemed to be associated with a relatively low birth weight (Fig. 3). At earlier gestational ages this association was not apparent. Furthermore the majority of those foetuses with a high B:L ratio had been born prematurely.

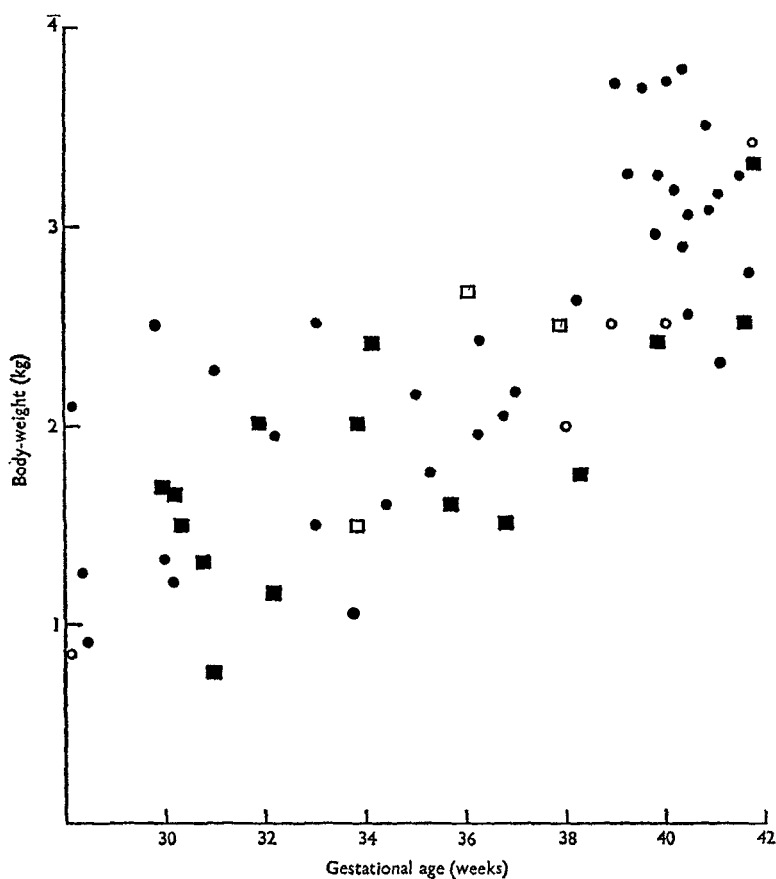


Fig. 3. Birth weights and gestational ages of Pakistani (○, □) and English (●, ■) infants who had died in the perinatal period. Ratio, brain weight : liver weight less than (○, ●) or greater than (□, ■) 3.5.

Among the nutrients being measured in liver is folic acid. The amount of folate seems to decrease as the B:L ratio increases. In order to take some account of differences in body size, the total amount of folate in liver per kg body-weight was calculated and the results are shown in Fig. 4.

Babies with a high B:L ratio did not achieve high levels of liver folate as did an appreciable number of those with lower B:L ratios. This was also true of the amount of iron in the liver.

The smallest amounts of folate in the liver were found in the present study to be more common among infants born on a low plane of nutrition as judged by the

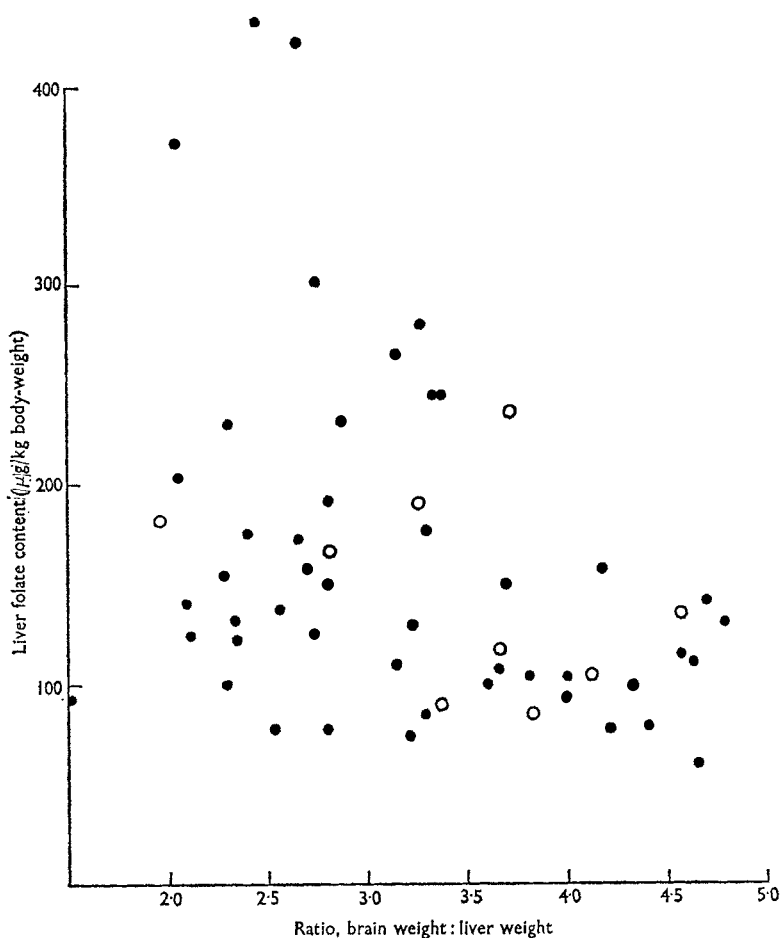


Fig. 4. Total amount of folate in the livers of some Pakistani (○) and English (●) infants who had died in the perinatal period, in relation to body-weight and ratio of brain weight : liver weight.

relative size of the liver and brain. This was equally true for Asian and English children. Folate deficiency has been found to occur in some mothers early in pregnancy and may interfere with normal development of the placenta (Hibbard, Hibbard & Jeffcoate, 1965). These authors suggest that even though such deficiency is temporary placental damage might be permanent. Thus, folate deficiency in the mother might be associated not only with folate deficiency in the foetus, but also with other forms of foetal malnutrition referable to placental insufficiency (Gruenwald, 1963). By measuring the amount of folate in the foetus we are providing new information which may help in understanding the relation of the vitamin to foetal nutrition. The results obtained so far, although very limited, are compatible with the conclusion of Hibbard *et al.* (1965).

The investigation in Bradford has so far shown that Asian and English infants are similar as judged by rate of growth after birth, the relative size of liver to brain

during late foetal development and the amount of folate in the liver. However, the mean birth weight of Asians is less than that of English babies born in Bradford and at all gestational ages the individual birth weights of Asians were nearly always relatively low; there was a relatively high proportion of Asian babies in which the amount of iron in the liver was small. Thus, there is a little evidence that the Pakistani infant born in this country may be slightly worse off nutritionally than the English infant, but the extent of the inquiry so far is not sufficient to justify firm conclusions about this.

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The nutritional status of West Indian immigrants

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As a paediatrician and not an expert nutritionist I shall have to confine myself to the nutritional status of West Indian children. My knowledge of West Indian children is derived from the in- and out-patients of several south-east London hospitals situated in areas of high immigrant density, and from observations of West Indian infants and toddlers attending an evening infant welfare clinic at Notting Hill Gate.

The percentage of West Indian in- and out-patients at these hospitals varies between 15 and 21. The total number of in-patients is about 2500 per year and the number of out-patients is about 5000 per year. Attendances at the weekly Notting Hill Clinic have risen from 486 to 1063 per year during the last 4 years. At that clinic almost all the infants and toddlers seen are West Indian.

The breast-feeding performance of the great majority of West Indian mothers is markedly superior to that of their non-coloured sisters. As a result the nutrition of their infants during the first 6 months of life is very good. In spite of their excellent lactation potential, discontinuation of breast feeding is almost universal once maternity benefits have ceased, because the great majority of mothers have to