in fetal sera is derived from the maternal circulation and there is no evidence that these proteins are secreted by the choroidal plexi, it seems that IgG molecules present in fetal CSF are derived from blood. These findings support the suggestion that the permeability of the blood-brain barrier is not fully developed during fetal life (Davson, 1967).

The presence of high AFP levels in fetal CSF raises another important point in relation to the increased levels of this fetal protein in the amniotic fluids of fetuses with 'open' neural-tube defects (Brock and Cutcliffe, 1972; Seller et al., 1973). It has been repeatedly suggested that in conditions where the neural tissue is exposed, AFP passes from the CSF into the amniotic cavity. The observation that AFP is present in high concentration in fetal CSF seems to support this hypothesis, though other mechanisms may be involved as well (Adinolfi, 1974).

**Summary**

Cerebrospinal fluid from 6 fetuses, 16½–25½ weeks of gestation, was assayed for the levels of α-fetoprotein, albumin, and IgG. All these proteins were present in significant amounts. The level of α-fetoprotein decreased, albumin increased, and IgG remained roughly constant during this period. These results suggest that the permeability of the blood-brain barrier is not fully developed in the fetus.

This work was supported by the Spastics Society and the Medical Research Council. We thank Susan Blunt, M. R. Creasy, and Dr. J. D. Singer for abortus specimens and chromosome results.

**References**


---

**Children with duodenal ulcers and their families**

Duodenal ulcer in children has been reported with increasing frequency in recent years (Robb, Orszulok, and Odling-Smee, 1972), but there is little information available concerning the incidence of peptic ulcer in the families of these patients with duodenal ulcer. An effort has been made in this study to determine the incidence of peptic ulcer in the relatives of affected children.

**Materials and methods**

Thirty-seven children were admitted with duodenal ulcer to this hospital in Dublin from 1960 to 1973. There were 24 boys and 13 girls, ages ranging from 15 months to 14 years. Diagnosis was made by barium meal examination in 34 patients, at operation in 2, and the ulcer was discovered at necropsy in one patient. A family history of peptic ulcer was recorded and was regarded as positive if one or other parent, grandparent, sib, aunt, or uncle was known to have the ulcer on the basis of barium meal examination or previous gastric surgery.

**Results**

The study revealed that 23 of the 37 children (62%) had a positive family history of peptic ulcer; 8 patients had a negative family history; and in 6 cases no family history could be obtained. A total of 40 relatives were found to have definite ulcers (Table). 13 children had only one relative with an ulcer. In the remaining 10 children there were 2 or more affected relatives.

Investigation of the degree of relationship of affected family members revealed that the most frequently affected relatives were those who had the closest relationship with the children with duodenal ulcers. 19 of 23 children had one or other parents or sib affected with the disease. In 13 children there was a family history of peptic ulcer in the father.

**Discussion**

Our findings show a significant familial aggregation of peptic ulcers and emphasize the importance
of familial pattern in the understanding of this disease. A positive family history of peptic ulcer is an important feature and is one of the basic characteristics of a duodenal ulcer in children.

Summary

The families of 37 children with the established diagnosis of duodenal ulcer were studied to assess the incidence of peptic ulcer in the relatives of these children. 23 children had a positive family history of peptic ulcer: 19 children had one or other parent or sibling affected with the disease. Positive family history is an important characteristic of duodenal ulcer in children.

References


P. Puri* and Edna Boyd
Children’s Research Centre, Our Lady’s Hospital for Sick Children, Crumlin, Dublin, Eire.

*Correspondence to Dr. P. Puri, The Hospital for Sick Children, Great Ormond Street, London WC1N 3JH.

Combined immunodeficiency with hyper-γ-globulinaemia

Infants with major defects in cell-mediated immunity and hypo-γ-globulinaemia (severe combined immunodeficiency) usually die in the first few years of life from infections unless they receive a successful bone marrow transplant. Nezelof et al. (1964) described an infant with a major defect in cell-mediated immunity and normal serum immunoglobulin levels who died at 16 months from a lung infection. This paper describes a similar infant with absent cell-mediated immunity and hyper-γ-globulinaemia in whom we were unable to show any functional antibody.

Case report

A male was born at term, of normal delivery, birth-weight 3·6 kg, after an uneventful first pregnancy. At 10 weeks he presented with failure to thrive (weight 4·5 kg), loose stools, and intermittent cough soon followed by bronchopneumonia. There was lymphopenia, neutropenia, and eosinophilia (lymphocytes 208/mm³, neutrophils 1440/mm³, eosinophils 800/mm³). Serum immunoglobulins were: IgG 200, IgA 20, IgM 35 mg/100 ml. Pneumonia responded slowly to antibiotics but lymphopenia persisted (lymphocytes 70 to 99 mm³). Tonsils and lymph nodes were not clinically detectable and the thymus was not visible on chest x-ray. At 4 months he was readmitted with fever, loose stools, and continued poor weight gain. Stool culture grew Pseudomonas aeruginosa. Sweat sodium was 11 mmol/l and chloride 12 mmol/l. Jejunal biopsy was normal and contained plasma cells. Tests for malabsorption were negative.

Over the next 8 months he developed several upper respiratory infections, pneumococcal pneumonia, and an intractable oral Candida infection. At 12 months he weighed 8·3 kg and at 14 months was admitted to Northwick Park Hospital for further investigations of his immune status. On examination he was wasted, height and weight being below the 3rd centile. Lateral x-ray of the nasopharynx did not show the adenoidal pad. No other significant abnormalities were found.

Initial laboratory investigations. Haemoglobin 11·7 g/dl, neutrophils 7300/mm³, lymphocytes 291/mm³, eosinophils 1168/mm³. Examination of the bone marrow was normal apart from absence of iron stores. Serum immunoglobulins in mg/100 ml with 95% normal adult range in parentheses: IgG 400 (646–1484), IgA 41 (73–552), IgM 114 (50–261), IgD 5 units/ml (5–50), IgE 3 units/ml (25–373). Blood group O, no isohemagglutinins detected. There were no 'natural' serum hemagglutinating antibodies to a pooled polysaccharide antigen prepared from six common commensal serotypes of Esch. coli. Serum precipitins to Haemophilus influenzae, pneumococcus, Staphylococcus aureus, Pseudomonas aeruginosa, Klebsiella sp., and Candida albicans were not detected. He was immunized with 1·2 ml TAB vaccine (Burroughs Wellcome) and 0·5 ml tetanus toxoid (Lister Institute), with a booster after 8 weeks. No antibodies were detected to either immunization up to 2 months later (Widal <1: 10, H and O, tetanus antitoxin <1: 10 IU/ml). Intradermal injection of 0·1 ml 1% C. albicans (Bencard) failed to produce a reaction within 72 hours. Contact sensitivity to dinitrochlorobenzene (5% in acetone sensitizing dose and challenge with 0·1% after 3 weeks) was negative. An area on the