

a total of 11 months and though his height and weight remain below the 3rd centiles his rate of growth has subsequently increased. Biopsy of one of the plantar nodules 2 months after stopping prednisolone showed only hyperkeratosis. The results of lung function tests immediately after stopping prednisolone showed that the lungs were no longer stiff but that the airways resistance had increased further. Despite this the arterial oxygen tension had risen to normal levels. Five months later the airways obstruction was less marked (Table). It is now 21 months since the onset of the disease and 10 months since all treatment was stopped; there are no signs of a relapse.

Discussion

The respiratory function tests and the serial chest x-ray suggest that the pulmonary infiltration in this child has now been eradicated.

The clinical course emphasizes the importance of vigorous therapy in this condition. If one antimetabolite drug in combination with steroids fails to produce improvement or, alternatively, if relapse occurs, then a different one should be tried.

In the light of experience gained in treating Hodgkin's disease (Fairley, 1969), it may be that intensive initial therapy using combinations of more than one antimetabolite and steroids would produce better results.

Summary

The successful treatment of an infant with Letterer-Siwe's disease using vincristine, cyclophosphamide, and steroids is described. It is suggested that combination therapy using more than one antimetabolite drug might produce better results in this condition.

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C. CHANTLER, A. D. MILNER, and M. H. WINTERBORN

Queen Elizabeth Hospital for Children, London E.2, and the Institute of Child Health, London W.C.1.

Congenital Hypertrophic Pyloric Stenosis in Phenotypic Female Twins with X/XX Mosaicism

Congenital hypertrophic pyloric stenosis has an incidence of about 1 per 200 (5 per 1000) live male births and 1 per 1000 live female births, with a male to female sex ratio of 5:1 (Carter and Evans, 1969). Its occurrence in both of a set of female twin infants is of interest. To our knowledge, 4 previous reports of pyloric stenosis in female twins have been made (Metrakos, 1953; Benson and Lloyd, 1964), but there are no reports of the chromosomes of such patients.

The purpose of this paper is to document the occurrence of pyloric stenosis in a further set of twin female infants, both of whom have X/XX sex chromosome mosaicism.

Case Summaries

Relevant clinical data are shown in Table I. Both infants had symptoms and signs of pyloric stenosis and the diagnosis was confirmed by tumour palpation, radiology, and subsequent operation. Symptoms persisted in spite of formula modification, gastric aspiration before feeds, oral and intramuscular metoclopramide,* and freshly prepared oral atropine methyl nitrate† (given to one infant with severe toxicity, including convulsions). Both infants were submitted to a Fredet-Ramstedt's pyloromyotomy, after which they progressed well. The subjects were the first children born to a young white Caucasian couple. At the time of the infants' birth the mother and father were 18 and 20 years of age, respectively, and were unrelated. No history of pyloric stenosis was obtained from the near relatives (parents, grandparents, paternal and maternal sibs, and offspring of paternal and maternal sibs). In spite of dissimilar facial appearance of the infants (Fig.), investigations (Table II) favour development from a single ovum indicating monozygosity.

Cytogenetic Findings

Peripheral blood lymphocytes from the patients (at age 5 months) and their mother were cultured by standard techniques. The mother had a normal female (46,XX) karyotype. Both infants were found to have sex chromosome mosaicism: approximately 66% of the

* Maxolon. Beecham Laboratories.

† Eumydrine. Winthrop Laboratories.

TABLE I
Clinical Data on Patients Reported

	Twin 1	Twin 2
Date of birth	2/12/1969	2/12/1969
Birthweight (kg)	3.0	3.4
Age at onset of symptoms (dy)	16	25
Weight on admission to hospital (kg)	2.5	2.8
Age at operation (dy)	26	32
Weight at surgery (kg)	2.8	3.0
Weight at 5 months (kg)	6.6	6.7
Chromosomal analysis	X/XX	X/XX
Buccal smear	7% +	11% +

metaphase spreads examined were normal (46,XX) and the remainder were 45,X. Estimation of buccal sex chromatin frequency showed twin 1 to be 7% positive and twin 2 to be 11% positive.

Discussion

Metrakos reviewed the published reports of pyloric stenosis in twins. Of 132 pairs (where at least one member of each pair was affected), only 3 sets had both females affected (Cases 15, 82, and 128) compared with 31 sets where both males were affected. In 2 of the 3 female twin pairs the zygoty of the patients was considered to be inaccurate or based on insufficient evidence.

Benson and Lloyd (1964) reviewed 1120 cases of pyloric stenosis which included 22 sets of twins, 1 pair of which were affected females. Carter and Evans (1969) reviewed the inheritance of pyloric stenosis based on an analysis of 1638 cases

TABLE II
Blood Group Phenotype and Tissue Type of Identical Twins

<i>Blood Grouping</i>											
B	NsNs	hr ^s +	K—	CDe/cDE	(Rh ₁ Rh ₂)						
P ₁	C ^w neg	Lu (a—)	Xg (a+)	Ie (a+b—)	Jk (a+b+)						
Do (a+)				Fy (a+b+)	I doubtful						
<i>Tissue Typing</i>											
First (IA) sublocus											
HL-A						Te					
1	2	3	9	10	11	59	28				
—	+	—	—	—	—	—	—				
Second (four) sublocus											
HL-A					Te						
5	7	8	12	13	60	54	55	57	18	22	27
+	+	—	—	—	—	—	—	—	NT	NT	NT

The + signs indicate antigens detected.

of whom 1239 were subsequently traced. Of these, only 8 were twinborn and in only 1 instance was the co-twin affected (1 male and 1 female). MacMahon and McKeown (1955) reported pyloric stenosis in 81 pairs of twins; none was concordant female.

It is not clear whether the presence of pyloric stenosis in identical twins is consistent with a

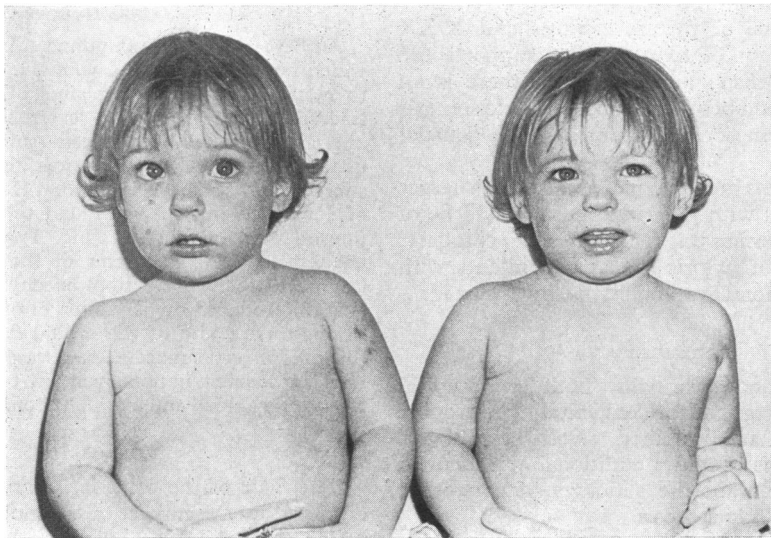


FIG.—The twins at 13 months of age. Twin 1 is on the right.

hereditary mechanism in the aetiology of the disorder. Evidence for a genetic component in the aetiology of pyloric stenosis was suggested by Metrakos (whose series of cases were assembled from the literature) who stated that there was a higher concordance rate of the disease in monozygotic twins than in dizygotic pairs of the same sex. In contrast, the study of a consecutive series by MacMahon and McKeown (1955) showed no difference in concordance by zygosity, and an incidence of pyloric stenosis in one or both of twins no different from that in the general population.

Karyotypic abnormality. The twin girls reported in this article have 45,X/46,XX mosaicism. They are phenotypically females and both appear to be normal. Neither show stigmata of the Bonnevie-Ullrich syndrome and it is too early to diagnose gonadal dysgenesis. That both patients have similar karyotypes suggests that twinning occurred after the mosaicism had been established. Benson and King (1964) were the first to report a higher prevalence of pyloric stenosis in patients with gonadal dysgenesis; though the coexistence of these two disorders had previously been reported on two occasions (Keay and Lewis, 1954; Lindsten, 1963).

In 2 of the 4 patients reported by Benson and King (1964) the karyotype was X/XX and in the other 2, 45,X. These authors suggested that the occurrence of pyloric stenosis (which occurs predominantly in males) in subjects with gonadal dysgenesis is related to monosomy-X; the incidence in such patients might be similar to that in males.

The occurrence of pyloric stenosis and X/XX mosaicism in both of twin females supports the hypothesis of Benson and King that there is an aetiological relation between familial pyloric stenosis and the chromosomal anomaly of gonadal dysgenesis.

Studies of the chromosomal pattern in a larger series of patients with pyloric stenosis would be of interest in elucidating this relation. As a corollary, the occurrence of pyloric stenosis in infants with chromosomal anomalies should be investigated.

Summary

A pair of monozygotic twins, both phenotypical females and concordant for congenital hypertrophic pyloric stenosis, are described. Both have X/XX mosaicism. This provides additional evidence for a hereditary factor in the aetiology of congenital hypertrophic pyloric stenosis.

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RONALD VAN DER HORST, JULIE FRANKEL, and JIM GRACE

The Department of Paediatrics, University of Natal; and the Department of Cytogenetics, Natal Institute of Immunology, Durban, South Africa

Orbital Blow Out Fracture

Fractures of the orbital floor may occur in association with multiple facial injuries, or in isolation while the orbital rim remains intact. Such isolated injuries may be caused by a blow to the eye from a fist or a tennis ball and present a characteristic picture which has recently been reviewed by Lerman (1970). The condition is rare in childhood.

Case Report

An 8-year-old boy was punched in the left eye after which he was drowsy and vomited. He was admitted to another hospital where plain skull x-rays showed no fracture. There were no external signs of injury around the eye and his symptoms subsided in the course of the next few days and he was discharged. He was subsequently seen at The London Hospital complaining of double vision, and was found to have limitation of upward gaze to the left (Fig. 1) with diplopia plus enophthalmos. Tomograms of the orbit showed the characteristic 'hanging drop' opacity in the left antrum (Fig. 2) produced by herniation of orbital fat and fascia through a fracture of the orbital floor. At operation the inferior rectus muscle was released from the fracture with subsequent improvement in upward gaze. The fracture was small and a graft of bone or Teflon was not required.

Discussion

The floor of the orbit is paper thin and may be damaged by the impact of the globe from an injury which the orbital rim and facial bones can easily withstand. The injury may be slight and leave