has been followed by death, or failure to control the disease, in 17% of the patients in group 2, in contrast with a 1% mortality in group 1.

Of the six patients who still have active disease in group 2, one had fully sensitive organisms, but stopped his drugs three months after operation; one had organisms resistant to all three; and the remaining four had organisms resistant to two antibiotics.

Mortality.—The one death in group 1 occurred in a patient with sensitive organisms, a man of 55 who died suddenly of acute dilatation of the stomach the day after operation. The organisms of six of the seven patients who died in group 2 showed significant resistance. One died of uncontrollable haemorrhage after a lobectomy, believed to be due to hypoprothrombinaemia, and one died during operation of ventricular fibrillation. The other four died of tuberculous complications (broncho-pleural fistula in two, and uncontrollable spread of disease in two). The specimen of the seventh patient, who died of respiratory insufficiency, was culture-negative.

Discussion

The high incidence of bacterial resistance in the culture-positive specimens very strongly suggests a causal relationship. It appears that the principal indication for resection is the persistently positive sputum culture where bacterial resistance has been demonstrated; notwithstanding that a small proportion, less than 5%, of patients having good chemotherapy may develop resistance which cannot be recognized as clinically their cultures remain negative.

Patients showing bacterial resistance are widely recognized as carrying an increased risk of complications following surgery; so that further assessment is required of the value of antibiotics, other than the three standard ones, as effective cover for resection in this type of case.

The results of continued satisfactory chemotherapy, followed by resection during the first course of treatment, are excellent; on the bacteriological evidence, however, it appears that operation was definitely necessary in only 3, and probably necessary in another 7, of the 95 patients so treated.

Summary

The bacteriological findings in resected tuberculous lesions from 170 consecutive patients are described; the recovery of positive cultures with resistant organisms, the surgical mortality, and the continued activity of the disease were all substantial in patients having prior chemotherapy falling short of the standards laid down by the Medical Research Council. In contrast, there was only one surgical death and no other morbidity in patients having satisfactory chemotherapy.

The bearing of the findings on the indications for surgical resection is discussed.

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INDIAN CHILDHOOD CIRRHOSIS

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Ever since its first description by Sen (1887), cirrhosis of the liver in infants and young children has been extensively reported from all parts of India. There is, however, no authentic report from the Province of Punjab, where Jelliffe *et al.* (1957) believe it to be rare. The object of the present paper is to focus attention on certain clinical aspects of the disease as seen in this province and to elucidate certain points of its aetiology.

Methods and Material

Thirty-three cases admitted over a period of about one and a half years were studied. Investigations on each case included a thorough history and physical examination, liver-function tests, needle biopsy of the liver, and tests for evidence of haemolytic disease.

All the cases included in this series conformed to the definition of the disease enunciated by the liver diseases subcommittee of the Indian Council of Medical Research (1955): "Infantile cirrhosis of liver is a disease peculiar to India, affecting infants and young children, with a tendency to run in families. It is characterized in the early stages by enlargement of the liver, which is felt to be hard, and usually also of the spleen, with ascites and vague symptomatology, course variable but generally rather slow and termination usually fatal. Its aetiology is unknown." Cases with a definite aetiology like congenital syphilis, infective hepatitis, rhesus incompatibility, or various inborn errors of metabolism were not included.

Observations and Comments

Age and Sex Incidence.—Patients varied in age from 9 months to 7 years, being predominantly confined to the 1–3 years age group. All but three were males. This significant male preponderance is in striking contrast to the hospital admission for other diseases, and agrees with the findings of Srivastava and Aikat (1954) and Mukherjee *et al.* (1954). However, Achar and Raju (1951) observed no difference in incidence in the two sexes.

Racial and Religious Factors.—This report covers a geographical area which is predominantly inhabited by Sikhs in the villages, yet only 7 out of 33 patients were Sikhs. The rest were Hindus, out of whom as many as 20 were confined to a particular sect, Aggarwal Bania—a strictly vegetarian community for generations.

Family History.—More than one sibling in the family was affected in 11 cases (33%). This is within the previously reported limit of 20–40%.

Clinical Features.—The majority of cases could be classified clinically into two groups—acute and subacute. The acute type had a superficial resemblance to the

Comparison of Acute and Subacute Group of Cases

	Total No.	Average Age	Sex Ratio	Racial Factors	Family History	Clinical Features	Histopathology	Prognosis	Possible Aetiology
Acute	13	1.28 years	10 M 3 F	Sikhs, 5 Hindus, 8	Nil	Acute hepatocellular failure	More of eosinophil clumping and inclusions	Uniformly poor	Viral ?
Subacute ..	20	2.40 years	All male	Sikhs, 2 Hindus, 18	55%	Subacute hepatosplenomegaly	Usual portal cirrhosis	Guarded	Hereditary genetic

acute stage of veno-occlusive disease, but was clearly distinguished from the latter by the subsequent course of the disease, by an invariably unfavourable prognosis, and by the histopathological features. Patients in this group had a short history, were of comparatively young age, and had a negative family history. The clinical picture was that of acute hepatocellular damage like a fulminant case of infective hepatitis. Prognosis was grave, most of these patients dying of liver failure. The subacute group consisted of older children. Most of the cases occurred in a particular sect of the Hindu community. A history of similar illness in other siblings of the family was frequent. Hepatosplenomegaly was present, but hepatocellular failure was not very advanced. The prognosis of this group was also grave, most patients passing to an advanced stage of liver failure, but some of them recovered. The two groups are compared in the Table.

Histopathology.—Histopathological data regarding infantile cirrhosis is rather scanty, because very few post-mortem examinations are permitted. In the present material liver biopsy was performed in 22 cases and evidence of cirrhosis was seen in 19. The histopathological findings were similar to those described by the Indian Council of Medical Research subcommittee. The initial lesion was probably a degeneration of liver cells, which had a vacuolated appearance, many of them showing typical eosinophil clumping in the cytoplasm.

Showing structural disorganization of lobular pattern.

Other cases showed more definite inclusions. These two types of changes were thought to be specific to the lesion of infantile cirrhosis. Subsequent to initial degeneration of liver cells, there was structural disorganization of lobular pattern (see Fig.) with consequent disturbances in the intralobular circulation.

Aetiology.—Cirrhosis in infants and children is common throughout India, though less so in the well-fed northern state of Punjab than in other provinces, such as Bengal and Madras. However, the aetiology of the

condition remains obscure. The currently accepted hypotheses regarding its aetiology pertain to toxic, infective, and nutritional factors. The toxic factors are classically seen to operate in the veno-occlusive disease described in Jamaican children (Stuart and Bras, 1957). In the childhood variety of Indian cirrhosis there is usually no history of consumption of toxic alkaloids. The characteristic histopathological feature of occlusion of hepatic veins is also not seen in Indians. This has been confirmed by the Indian Council of Medical Research subcommittee. In the present material not a single biopsy specimen showed histopathological features of veno-occlusive disease. The subacute group of cases in this series present a number of features—namely, the high incidence of family history, frequent occurrence in a particular group of individuals, and predominance in males—which lead us to agree with Merchant (1952) that the disease is inherited as a sex-linked condition in most cases. The acute variety, however, probably has a different aetiology, and the possibility of a viral infection cannot be strictly ruled out. Our efforts to transmit the disease to albino rats from the stool filtrate of patients have not so far been successful.

Summary

A clinical study of 33 cases of infantile cirrhosis is described from the province of Punjab, India. Two clinically distinct varieties of the disease are met with. In one the course is acute and fulminant and the prognosis is invariably unfavourable. These cases occur at a comparatively young age, and the genetic factors are not important in their aetiology. The second type of the disease occurs in older children, and the clinical picture is limited to hepatosplenomegaly for a considerable time before liver-cell failure supervenes. This disease occurs particularly in the Hindu Bania sect, and genetic factors are predominant in its aetiology.

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