AUSTRALIA/HEPATITIS—ASSOCIATED ANTIGEN IN INDIAN CHILDHOOD CIRRHOSIS

S.S. Kelkar, V.N. Ingle and M.R. Toshniwal

Aurangabad

Although the clinico-pathological features of Indian childhood cirrhosis (ICC) are clearcut and characteristic, its aetiology remains obscure. Chandra and Seth (1972) have summarised the current concepts; multiple factors are likely and one of these may be a virus. Recently the Australia (Au)/hepatitis-associated antigen has been shown to be the surface antigen of the virus of serum hepatitis (SH) (Bayer et al. 1968, Giles et al. 1969, Prince 1968). The SH virus, which has still not been grown in the laboratory, except by transmission to chimpanzees, is detected by immunological methods like agar-gel diffusion (AGD), immunoelectroosmosphoresis (IEOP), complement fixation and radioimmunoassay. The virus seems to play an important role in the aetiology of some forms of adult cirrhosis (Anthony et al. 1972, Prince 1971). There is slender evidence that mothers carrying Au antigen might transmit the virus to their foetuses in utero (Turner et al. 1971). A few investigations (Chandra 1970, Sudaravalli et al. 1971, Chandra et al. 1972, Dhatt et al. 1973) indicate that a significant number of cases of ICC are associated with the antigen of the SH virus. However, there is a considerable discrepancy in the recorded incidence.

We record here our studies of the prevalence of Au antigen in ICC at Aurangabad, Maharashtra, using the more sensitive IEOP test for detection of the Au antigen.

Materials and Methods

Selection of cases. 31 cases of ICC admitted to the Medical College Hospital, Aurangabad, were studied. The criteria for diagnosis were: chronicity of complaints which were vague and included altered bowel habits; loss of appetite and irritability; an enlarged firm liver with a leafy edge, splenomegaly, ascites, oedema and jaundice; and a moderate elevation of the serum glutamic oxaloacetic transaminase (SGOT) levels. SGOT was estimated by the method of Reitman and Frankel (1957). Doubtful cases were excluded. In 12 cases, a needle biopsy of the liver was done and studied histologically for confirming the diagnosis of ICC. Sera from the 31 cases were collected and stored frozen. They were tested for the presence of Au antigen by the IEOP technique. 625 sera from blood donors at the Blood Bank, Medical College, Aurangabad, were also studied for the presence of Au antigen.

IEOP test for Au antigen. This was according to the method of Kelkar et al. (1972). Briefly the method is as follows: The buffer was a barbital acetate buffer of ionic strength 0.13 M at a pH of 8.6. A gel was made by adding Difco Bacto...
agar in a concentration of 0.85 per cent and 1.5 ml of hot gel was poured on a microscope slide 76 x 26 mm. Eleven sets of 3 wells, each 3 mm in diameter and at a distance of 2 mm were punched on each slide; a twelfth set of 2 wells was used as a control. Sera to be tested were placed in the central well and samples of known antigen and antibody to its left and right respectively. This ensured detection of both antigen and antibody at the same time. The electrophoretic run was for 50 minutes at a constant current of 10 mA per slide. Results were read using a bright intense beam of indirect light against a dark background. Fig. 1 shows a run of 11 sera from blood donors. This method regularly detected a reference antigen at a dilution of 1 in 128 and was 5 times as sensitive as AGD.

Anti-Au serum. This was serum from a case of thalassaemia. It had been tested and had shown a reaction of identity with an antibody serum obtained from the Dept. of Microbiology, University of Bergen, Norway. Fig. 2 shows this reaction of identity. The same patient's serum had also been previously tested with reference sera from Dr. Blumberg's laboratory.

Results

The 31 cases of ICC had a mean age of 23 months and ranged from 6 months to 5 years of age. Twenty-six were males and 5 females; one male and a female were twins. Eleven cases came from the Maratha community, 7 were Marwaris, 4 Brahmins, 3 Wanjaris and one each belonged to the Gosavi, backward classes, Wani and the Muslim (Sunni) groups. SGOT values were raised in all cases except one, with a mean value of 131 units and a range of 14 to 156 units. The only case with the normal value of 14 units was proven to be a case of ICC by liver biopsy. Needle biopsy was done in 12 cases and in all it showed unequivocal evidence of ICC—extensive destruction of parenchymal cells with fibrosis around single or small groups of cells. All the sera from the 31 patients with ICC were run twice by the IEOP technique and none showed the presence with either Au antigen or antibody. In contrast, 25 of the 625 blood donors (4 per cent) had Au antigen.

Discussion

Data on the prevalence of the Au antigen in ICC is variable. Chandra (1970) found the antigen in 6 of 30 cases. In a subsequent report the incidence was 14 per cent (Chandra et al. 1972). The authors underscored the role of the SH virus in the pathogenesis of ICC; the suggestion was that immunological mechanisms perpetuated the liver cell injury caused by a primary aetiological agent, possibly SH virus. Sudaravalli et al. (1971) found the Au antigen in 2 of 8 biopsy-proven cases of ICC; both these were of the "malignant hepatitis" variety—cases with an icteric onset and with a rapid progress. Aggarwal (1972) found a very high incidence of Au antigen in ICC—36 per cent. Recently, Dhatt et al. (1973) reported the absence of Au antigen in all 17 cases of ICC studied.

All the cases reported in this communication were florid, clearcut and advanced cases of ICC. None of the sera from these cases was positive for