operation suggest that major surgical interference, with burns colonized by bacteria, early in the after-burn period may lead to the establishment of systemic infection.

Biochemical, Histological, and Serological Investigations in Asymptomatic Carriers of Australia Antigen

D. M. GOLDBERG (*The Royal Hospital, Sheffield*), R. I. RUSSELL AND J. G. ALLEN (*Royal Infirmary, Glasgow*), R. N. M. MACSWEEN (*Western Infirmary, Glasgow*), AND J. WALLACE (*Glasgow and West of Scotland Regional Transfusion Centre*) Thirty-nine blood donors found to be Australia antigen or antibody positive were studied for evidence of hepatic disease. Twenty donors gave a history of possible exposure to infection with viral hepatitis. Seven had severe and five had minor biochemical abnormalities; eight of these 12 subjects had Australia antigen and four antibody; 23 subjects had normal biochemistry. Of 11 donors who underwent hepatic biopsy, three were found to have evidence of chronic persistent hepatitis. Two of these three had antigen and one had antibody. Minor histological abnormalities were found in a further five donors. Five donors with normal biochemistry were biopsied, and one of these was found to have chronic persistent hepatitis.

The results suggest that subjects with persistently positive tests for Australia antigen are at risk of developing chronic hepatic disease, and that those with positive tests for antibody are at similar risk. Close follow up of blood donors and other subjects found to have positive tests is thus indicated. Although abnormalities in biochemistry may be present in such subjects, normal biochemical tests do not exclude abnormal hepatic histology. Conventional 'liver function tests' were of little value, and all other antibody tests yielded negative results. Serum enzymes were far the most sensitive indices of probable hepatic involvement, aspartate transaminase, isocitrate dehydrogenase, glutamate dehydrogenase, and adenosine deaminase being the most useful of the eight enzymes studied.

Recent Developments in Globin Structure

H. LEHMANN (*Addenbrooke's Hospital, Cambridge*) The duplicated β-chain is the δ-chain. They differ by 10 out of 146 residues and one forms part of Hb A ($\alpha_2\beta_2$), and the other of Hb A_2 ($\alpha_2\delta_2$) (Lehmann and Lang, 1973). On unequal crossing-over of two chromosomes with the genes (δ'-β' two types of fusion chromosomes result, one—($\delta\beta'$)—with the gene for the δ/β chain of Hb Lepore $\alpha_2(\delta/\beta)_2$ but no genes for a δ or a β chain, and the other $\delta'(\beta\delta')\beta'$ with a gene for the β/δ fusion chain of Hb anti-Lepore and additional genes for a δ and a β chain.

If the α chain is duplicated no chemical difference has so far been described. On unequal crossing-over, fusion chromosomes with a gene for one (α') and three α chains ($\alpha'\alpha'\alpha'$) should arise corresponding to those for the chromosomes for haemoglobin Lepore and anti-Lepore.

A heterozygote for the first would have three, and a homozygote two, instead of four α chain genes: and a heterozygote for the latter five, and a homozygote six instead of four. The first two conditions would be expected to cause an α-thalassaemia, and the latter a globin chain imbalance with a surplus of α chains. The resulting 'β-thalassaemia' would show a normal proportion of δ to β chains, ie, a normal haemoglobin A_2. One would not expect the cells to be hypochromic. The doubly abnormal heterozygote (α') ($\alpha'\alpha'\alpha'$) would be expected to be normal clinically but a carrier capable of handing a thalassaemic disorder to his offspring.

Reference

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The Early Diagnosis of Monocytic Leukaemia Based on a study of 91 Cases

J. G. HUMBLE (*Westminster Hospital, London*) In the past 36 years, 91 cases of monocytic and myelomonocytic leukaemia have been seen by the author at Westminster Hospital. There were 54 males and 37 females. The age distribution ranged from 6 weeks to 93 years. A slight preponderance of males was seen in the decade 59-69 whereas the female peak was seen in the decade 49-59. Using conventional staining methods and also by examining the living cells (Pulvertaft and Humble, 1960; Humble, 1967) the cases were divided into the two categories: true monocytic leukaemia (Schilling) 26 cases and myelomonocytic (Naemgeli) 65 cases. The series was studied to show the initial symptoms, signs, earliest blood count, and survival from the earliest symptom that could be confidently attributed to leukaemia to the death of the patient. It was found that in the true monocytic form the overall survival is much worse than in the myelomonocytic form. As to the presenting blood counts, 62% of the cases had a haemoglobin level of less than 9 g/dl and 45% had a white cell count of less than 10 000 per microlitre. Aetiological features in this series, and especially pre-leukaemic disturbances in the blood counts, will be discussed, as will the effect of treatment on survival.

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The Histology of Chronic Candidal Infection of the Rat's Tongue and its Relevance to Human Oral Leukoplakia

J. H. JONES AND C. RUSSELL (*Department of Oral Medicine, University of Manchester*) Superficial candidal penetration occurs in some cases of human oral leukoplakia which may progress to carcinoma. The relationship of mycelial penetration to leukoplakic change is not clearly understood and this experiment was designed to test the hypothesis of a direct association. One of two groups each of 60 rats was inoculated orally with *Candida albicans* and given tetracycline. The second group received *C. albicans* and tetracycline only during the inoculation process. One of two control groups each of 10 rats received no inoculation or medication and the second group tetracycline only. This summary describes histological findings only.

Infection, usually on the dorsal surface of the tongue as mycelial penetration limited to the keratinized layer of the epithelium, was demonstrated in 12, eight, seven, seven, and two animals out of groups of 20 after five, nine, 13, 16, and 21 weeks respectively. Infection was associated with the loss of the normal lingual papillae and with flat-surfaced hyper- or parakeratotic stratified squamous epithelium in which basal layer mitotic activity was sometimes prominent. Beneath infected epithelium mononuclear cells were found in the corium and the superficial muscle cells often showed degenerative changes with giant cell reaction and sarcolemmal proliferation. Striking inflammatory cell accumulation was sometimes found deeply in muscle around blood vessels. The histology demonstrates that candidal infection *per se*, though limited to the cornified layer of the epithelium, produces marked change in it and in the corium and underlying muscle, presumably due to substances released from disintegrating mycelia. The findings support the suggestion that *C. albicans* sometimes has an aetiological relationship with human leukoplakia (Cawson and Lehner, 1968).

Reference

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'Sclerosing Haemangioma' of the Lung: An Alternative View of its Development

A. KENNEDY (*Department of Pathology, University of Sheffield*) 'Sclerosing haemangioma' is a name which has been applied to a group of uncommon benign pulmonary lesions characterized by their papillary nature, a sclerotic stroma containing lipid and, in some cases, evidence of haemorrhage. There is little evidence that these lesions are really angiomatous. Studies of two examples removed surgically after being discovered as incidental radiographic findings show that the cells lining the papillae have large vacuoles which contain whorled electron-dense inclusions. These epithelial cells have the features of granular pneumonocytes, cells known to contain phospholipid. Both lipid and cholesterol are abundant in the stroma of both tumours and the lipid is distributed in a nodular fashion. Histochemically the lipid gives a strong reaction to stains for phospholipid and it is suggested that the lipid is derived not from the haemorrhage but is produced by the epithelial element of the tumour.

A Fine-needle Aspiration Biopsy Service

J. V. LEVER (*Department of Pathology, University of Bristol*) Fine-needle aspiration biopsy can be done anywhere, needs simple equipment and little preparation, causes the patient only slight discomfort, and is practically free from complications. Most patients do not mind several biopsies and the procedure can be followed immediately by irradiation (in contrast to surgical biopsy).

In the service described cells are aspirated from subcutaneous masses through a no. 1 needle with a 20 ml disposable plastic syringe. The aspirate is spread on a slide, air-dried, and stained by Giemsa's stain. Examples of the cytology obtained will be shown and the results of 350 biopsies taken in the first two years given. One hundred and sixty-four aspirates were from breasts, 81 from lymph nodes, and 105 from other sites.

Results were classified as positive (malignant cells identified), negative (no malignant cells identified), and failed (insufficient material or don't know).

Ninety-three were reported positive (one falsely), 196 were reported negative (28 falsely), and 61 biopsies failed (25 from malignancies).

When one bears in mind that some of the negative results did give a diagnosis, eg, abscess or fat necrosis, and many of the patients with failed biopsies had a subsequent positive aspiration, there is no doubt that the service is a useful extension of physical examination in patients with a subcutaneous mass.

II Symposium on renal transplantation

The Clinical Biochemistry of Transplants

D. EVANS (*Addenbrooke's Hospital, Cambridge*) The