A CASE OF LEUKAEMIA SHOWING MIXED MYELOID-LYMPHOID CHARACTERISTICS AND AN UNUSUAL CHROMOSOME PATTERN

A. S. TODD, SHEILA M. WOOD, JANET ROBERTSON, AND R. A. G. BROWN (*Dundee*) Many haematologists doubt the occurrence of mixed leukaemia since earlier case reports lack the precise data possible with modern haematological methods. In a few instances, however, it is difficult to deny the possibility of mixed leukaemia. In this report we present the clinical, haematological, cytogenetic, and necropsy findings in such a case.

The patient was a woman of 65 years. From the beginning her blood and bone marrow showed leukaemic cells of both lymphoid and myeloid series. Cytological studies showed an abnormal extra chromatin mass in the early myeloid cells. Cytogenetic studies showed the loss of a group E (17 or 18) chromosome in presumed myeloid cells. The same cells showed multiple minute paired chromatin bodies. Hitherto cytological and cytogenetic abnormalities of this type have been reported only in malignant tumours of children and in a bronchial carcinoma.

The patient also showed bilateral ureteric duplication, one of the multiple abnormalities associated with deletion of a group E chromosome. In this case, however, the somatic karyotype was normal female as judged by culture of skin and lymphocytes.

The probability of both types of leukaemia occurring together in a patient of this age and sex was calculated from leukaemia mortality tables and was found to be 50 to 60,000 times less than the probability of either type of leukaemia occurring alone. Nevertheless it seems very likely that the case is one of true mixed leukaemia.

RECURRENT FAMILIAL INFLAMMATORY FIBROID POLYPS OF THE SMALL INTESTINE

D. SPENCER (*Exeter*) Two cases, mother and daughter, are discussed. The daughter has suffered three episodes of ileo-ileal intussusception in five years. On each occasion a bowel resection was necessary to remove a polypoid tumour. The mother had a similar tumour causing an intussusception removed in 1967.

In each case the histopathology of the tumours was characteristic of inflammatory fibroid polyps, namely, an ulcerated surface, a loose oedematous fibroblastic stroma, and a uniform eosinophil infiltrate. These changes were confined to the submucosa, the underlying muscle and serosa being normal, clearly differentiating the polyps from eosinophilic granuloma of the small bowel which is diffuse, involving the full thickness of the bowel wall.

The histogenesis of the lesion is uncertain, many authors accepting an inflammatory theory first propounded by Helwig and Ranier (1953). Goldman and Friedman (1967) suggested that they were neurogenic tumours and Stout (1949) that they were haemangiopericytomas.

Subsequently the mother had three small polyps (two gastric, one ileal) removed, which were basically the same as the larger polyps, but without ulceration, odema, or eosinophils.

Therefore in our opinion the inflammatory changes are secondary to ulceration, rather than the primary lesion. The appearances of the smaller polyps are either hamartomas or true neoplasms, of the latter the most likely, histologically, and in view of the multifocal and familial tendency are neurofibromata.

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A CYTOLOGICAL METHOD FOR ASSESSING THE TOPOGRAPHY OF NEOPLASTIC CHANGE IN THE ENDOCERVICAL CANAL

D. M. D. EVANS (*Cardiff*) When a membrane such as a nucleopore filter (GEC) is applied to the ectocervix, cells from the cervical surface adhere to it; microscopical examination of the stained membrane provides a method for assessing the topography of a carcinoma *in situ* of the ectocervix (Evans, 1967; Evans, McCormack, Sanerkin, Ponsford, and Jones, 1969).

Membrane cytology has now been developed for assessing the extent of neoplastic change in the endocervical canal. A narrow cylinder of membrane is introduced into the endocervical canal by means of the Tenovus endocervical probe (Evans, 1969). This has a retractable cover to protect it from cell contamination during its introduction and removal. Withdrawal of the retractable cover brings the membrane into close contact with the endocervical canal lining and the surface cells adhere to it. Before allowing the preparation to dry it is sprayed with aerosol fixative. It may be conveniently transported to the laboratory in a plastic bag while still on the probe. It is then carefully removed and processed, the Papanicolaou-stained membrane being mounted on a slide like a histological specimen. Microscopic examination reveals the distribution of carcinoma cells over the impression area. By marking the position of carcinoma cell clusters by ink dots on the coverslip the extent of the lesion can be estimated. Correlation of the endocervical topographical cytology with the histological localization of the carcinoma *in situ* as revealed by the subsequent cone biopsy is being undertaken. The results are encouraging.

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TELEVISION SCANNING OF CERVICAL SMEARS: THE QUANTIMET

O. A. N. HUSAIN (*St Mary Abbots Hospital, London*) This image plane scanner, converted from its use in metal-lurgy, has been shown to be able to register the large, darkly stained nuclei of malignant exudates and scrape smears. Operating by means of a single spot scan with line memory, it is being used to test the hypothesis that malignant cervical scrape and irrigation smears contain enough of these large hyperchromatic malignant nuclei to provide a means of alerting the cytotechnician.

Though the series surveyed is still small, it is apparent that most if not all cases of carcinoma *in situ* are detected, but that certain glandular cancers and an occasional invasive squamous cancer might be missed.

The present instrument provides a 30-parameter measurement output per field in just under one second but its logic circuitry is not entirely appropriate to malignant cell scanning. A new instrument, more purpose built, is being constructed so that rapid scanning of linear cell tracks on film strip is possible. It is estimated that a three minute scan of around 50,000 cells should be possible if the problem of cell presentation and suitable contrast training is achieved.

It is suggested that a test profile may be necessary to detect the endometrial and other invasive cancers by adding the 6-phosphogluconate-dehydrogenase enzyme test to the cell samples of all women over the 45-age group.

LABORATORY TESTS IN VIRAL HEPATITIS

PATRICIA E. TAYLOR, A. J. ZUCKERMAN, AND W. D. BRIGHTON (*London School of Hygiene and Tropical Medicine, and the National Institute for Medical Research, Hampstead Laboratories*) Increasing evidence suggests that the Australia antigen is closely related to, if not identical, with the agent responsible for viral hepatitis (Levene and Blumberg, 1969; London, Sutnick, and Blumberg, 1969). This antigen was first described in 1964 by Blumberg who found that sera from two multiply transfused haemophiliacs contains an antibody which reacted with the serum of an Australian aborigine in immunodiffusion tests to form a single precipitin line. The aboriginal antigen was first considered to be another example of a serum protein pleomorphism, but this view was later modified with the discovery of its association with leukaemia, Down's syndrome, and hepatitis (Blumberg, Gerstley, Hungerford, London, and Sutnick, 1967). Soon after Blumberg's report, Prince (1968) described a similar closely related if not identical antigen, the SH antigen, in the blood of transfused patients during the incubation period and early acute phase of post-transfusion hepatitis.

A modified two-dimensional immunodiffusion technique, complement fixation, and immune electron microscopy are being used at the London School of Hygiene and Tropical Medicine to study the epidemiological distribution and morphological characteristics of the antigen. For all three tests, indicator sera containing antibody to the Australia-SH antigen have generally been obtained from patients who have been presumably hyper-immunized by receiving multiple transfusions of blood or plasma, some of it containing the Australia-SH antigen. On occasion, antibody to the antigen has also been found in persons who have not been transfused but who have had subclinical contact with cases of viral hepatitis.

The technique used for immunodiffusion and the source of reference reagents have already been described (Zuckerman and Taylor, 1969). With this technique, antigen has been found in approximately 40% of adult patients with acute viral hepatitis. Detectable antibody has not been found in sera collected from these patients during convalescence. The presence of the antigen is

usually transient during the acute phase of the disease. However, fresh samples of serum collected in 1968 and 1969 from a blood donor who was identified in 1951 as a 'silent' carrier of the virus of serum hepatitis have been found to contain the antigen (Zuckerman and Taylor, 1969). This indicates that, on occasion, a long-term carrier state may develop. Furthermore, in two instances, both antigen and antibody have been present at the same time in the same specimen of serum.

A standard microtitre complement fixation system (Sever, 1962) is also being used for the detection of Australia-SH antigen. Preliminary results indicate that this technique is somewhat more sensitive than immunodiffusion. Very high antigen titres, up to 1:2,048 or more, are found. With some specimens, a prozone effect is noticeable.

Immune electron microscopic studies, carried out in collaboration with Mrs J. D. Almeida and Professor A. P. Waterson of the Royal Postgraduate Medical School, have revealed characteristic particles which correspond to the Australia-SH antigen (Almeida, Zuckerman, Taylor, and Waterson, 1969). The main antigenic constituent is a roughly spherical particle approximately 200 Å in diameter. A considerable degree of pleomorphism exists and many tubular and aberrant forms are seen. The tubular forms may extend up to several thousand Ångströms in length, along which can be seen a periodicity of approximately 30 Å. The diameter of these tubular forms is approximately 200 Å.

In addition to the above studies, intensive efforts are being made to cultivate the responsible agent of viral hepatitis in tissue cultures of human embryonic liver, primary cultures of differentiated parenchymal cells and as a continuous cell line made up principally of spindle-shaped cells. Cultures of tissue obtained from adult liver by percutaneous needle biopsy are also being used. In addition, immunofluorescent methods similar to those described by Millman, Zavattone, Gerstley, and Blumberg (1969) are being applied for the detection of antigen in hepatic cells obtained by needle biopsy of the liver from patients with the antigen in the serum. Future studies include the development of other serological methods, including passive haemagglutination and immunoelectrophoresis, for the study of the antigen.

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THE BACTERIOLOGY OF TRAVELLER'S DIARRHOEA

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