g/l (6 g/100 ml) and serum albumin concentration 37 g/l (3.7 g/100 ml). Urinary fibrinogen degradation products were more than 10 µg/l (normal <2 µg/l). Creatinine clearance and serum urea and electrolyte concentrations were normal. The oedema persisted for a week but disappeared rapidly after treatment with bumetanide 1 mg daily. Four weeks later the diabetes was well controlled on 50 units Monotard insulin daily, the oedema had not returned despite stopping diuretics, and he had a normal urinary protein concentration.

Comment

The insulin oedema syndrome was first described by Leifer² and few other reports exist, although Shaper³ reported 17 cases presenting in Kampala between 1950 and 1961, representing 3.5% of registered diabetics for that period. In his patients oedema varied from mild facial swelling to anasarca. The patients were negroes and were said to have a considerable tendency to hypoglycaemia and recurrent oedema; they did not receive monocomponent insulin. Sudden retention of tissue fluid owing to glycogen deposition, accumulation of lactic and pyruvic acids in the tissues with a relative deficiency of thiamine, and increased glucocorticoid secretion were regarded as possible causes. Insulin may play an indirect part in regulating vascular permeability⁴ or may modify some of the inflammatory responses in delayed hypersensitivity.⁵ Some disorder of this nature would best fit the findings in our patient. The diabetes had started recently with oedema and proteinuria, although the latter was not severe enough to account for the considerable degree of oedema. A transient phase of increased vessel permeability seems the most likely explanation, although the picture was not that of angioneurotic oedema. We were puzzled by the rapid development of oedema. We have talked with colleagues who treat patients with diabetes and, although some were aware of the possibility of oedema, clearly it must be a rare phenomenon in Britain; its temporary nature is reassuring.

¹ Jackson, W P W, and Vinik, A L, *Diabetes Mellitus*. London, Edward Arnold, 1977.

² Leifer, A, *Journal of the American Medical Association*, 1928, **90**, 610.

³ Shaper, A G, *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 1966, **60**, 519.

⁴ Garcia-Leme, J, *et al*, *European Journal of Pharmacology*, 1974, **29**, 218.

⁵ Koltai, M, *et al*, *International Archives of Allergy and Applied Immunology*, 1975, **49**, 358.

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Acute myeloblastic leukaemia complicated by non-Hodgkin's lymphoma

Various types of leukaemia complicating Hodgkin's disease have been documented, though we could find only one report of a patient with acute myeloid leukaemia subsequently developing a lymphoma. This patient¹ was an 8-year-old girl with acute myeloid leukaemia treated by irradiation, who was found at necropsy to have Hodgkin's disease. We describe a patient with acute myeloid leukaemia who subsequently developed a non-Hodgkin's lymphoma.

Case report

A 69-year-old housewife presented in March 1977 with a short history of general malaise and lethargy. On examination she had generalised lymphadenopathy and hepatosplenomegaly. The peripheral blood smear contained 32% blast cells, and a bone-marrow aspirate 60% pleomorphic blast cells, establishing the diagnosis of acute myeloid leukaemia. She was treated with seven intermittent courses of cytarabine (cytosine arabinoside), 200 mg by intravenous infusion daily for three days, and doxorubicin, 60 mg intravenously on day 3. By July 1977 she was in complete remission with no lymphadenopathy or hepatosplenomegaly. She then received maintenance

treatment with cytarabine and doxorubicin and immunotherapy in the form of irradiated blast cells.²

She remained well until August 1978, when she complained of a two-week history of enlarged glands in the right groin and swelling of the right leg. She was found to have bilateral cervical, inguinal, and axillary lymphadenopathy, pitting oedema of the right leg extending from ankle to groin, and hepatosplenomegaly. No blast cells were seen in the peripheral blood, and a bone-marrow aspirate confirmed that she was still in remission. A bone-marrow trephine showed no tumour infiltration. Lymph-node biopsy was performed, and the histology was as follows. The node architecture was almost completely destroyed and replaced by a malignant lymphoma showing capsular infiltration. The lymphoma was composed largely of small lymphocytes of uniform size, which often showed angulated (cleaved) nuclei, best seen in a resin-embedded 1-µ section (fig). An extremely small proportion of less-well-differentiated lymphoid cells was present, as were several reactive histiocytes often containing nuclear debris. Occasional mitoses were seen. The tumour was regarded as a non-Hodgkin's lymphoma of small follicular-centre cells, classified as diffuse centrocytic (Kiel)³ or intermediate lymphocytic (WHO).⁴

Lymphoma showing lymphocytes with cleaved or angulated nuclei and occasional blast cells (arrow); 1-µ section, methacrylate embedded. Haematoxylin and phloxine × 400 (original magnification).

Comment

Various types of leukaemia have been described as a complication in Hodgkin's disease, and they are usually assumed to be related to cytotoxic chemotherapy or radiation, both of which are associated with leukaemia in patients with other diseases. In a review of 10 000 cases of Hodgkin's disease Crosby⁵ noted that the incidence of acute myeloid leukaemia was 10 times that in the general population. While the development of lymphomas is not associated specifically with cytotoxic chemotherapy, they sometimes occur in patients receiving long-term immunosuppression (for example, renal transplant recipients), and their development in a patient with acute myeloblastic leukaemia could be related to immunosuppression. Our patient was treated with doxorubicin and cytarabine, drugs not usually associated with powerful immunosuppression. In addition, these drugs were given intermittently with long drug-free periods between doses. This must raise the possibility of a direct link between acute myeloid leukaemia and non-Hodgkin's lymphoma. Any link between lymphomas and acute myeloid leukaemia might have escaped attention before because of the short survival of patients with these disorders. Owing to improved methods of treatment survival for both diseases is lengthening, and clinicians should be aware of a possible relation between them.

¹ Skworzoff, M A, *Frankfurter Zeitschrift für Pathologie*, 1930, **40**, 81.

² Powles, R H, *et al*, *British Journal of Cancer*, 1973, **28**, 365.

³ Gerard-Marchant, R, *et al*, *Lancet*, 1974, **2**, 406.

⁴ Mathé, G, *et al*, *WHO International Histological Classification of Tumours*, 1976, **14**, 37.

⁵ Crosby, W H, *Clinical Research*, 1969, **17**, 463.

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