Beta2-microglobulin in haematological malignancies

Beta2-microglobulin forms the light chain of the HLA antigen on the surface of all nucleated cells; the turnover of this membrane is the main source of the free beta2-microglobulin in the blood and other body fluids. As this microglobulin is a low-molecular-weight protein (11 400) it is freely filtered by the renal glomeruli and then catabolised by the tubules.1 The normal concentration of beta2-microglobulin in the blood rises slowly with age but is usually less than 3 mg/l even in the elderly. The concentration rises as the glomerular filtration rate falls, and raised amounts may also occur in many forms of advanced adenocarcinoma; this is, however, an inconsistent phenomenon and does not appear to be related to the progress of the cancer.2 In contrast, changes in serum concentrations of beta2-microglobulin may reflect events of clinical importance in haematological malignancies.

In untreated chronic lymphocytic leukaemia the concentrations of beta2-microglobulin increase with the clinical stage; in one such study the interquartile ranges were 0.2-2.8 mg/l in stages I and II, 2.7-5.3 mg/l in stages II and III and 4.4-16.9 mg/l in stages III and IV.3 The amounts of beta2-microglobulin do not correlate well with the peripheral lymphocyte count, but they do reflect the evolution of the disease, its progression, and its response to treatment.3-5 The findings in the malignant lymphomas are more complex, partly because of the variety of diseases included within this heading. In Hodgkin's disease serum concentrations of beta2-microglobulin tend to increase with the stage of the tumour, but the response shows considerable variation.6-8 In those histological types of non-Hodgkin's lymphomas known to be associated with a poor prognosis high concentrations of beta2-microglobulin are found before treatment and are related to survival.4 7 The clinical significance of a raised serum concentration of beta2-microglobulin in a patient with lymphoma apparently in clinical remission is uncertain; the answer will need to come from follow-up for several years.

Extension to the central nervous system is an important and dangerous complication in leukaemias and lymphomas. Investigators in Boston found that both the concentration of beta2-microglobulin in the cerebrospinal fluid and the ratio between it and the serum concentration of beta2-microglobulin were higher in patients with extension of their disease to the central nervous system and that this finding might prove to be clinically useful as a marker.8