Deficiency of Eosinophil Peroxidase Detected by Automated Cytochemistry

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Eosinophil and neutrophil/monocyte peroxidases differ in biochemical [1], antigenic [2] and functional characteristics [3] and in genetic control. Individuals with inherited deficiency of neutrophil/monocyte peroxidase [4, 5] have normal levels of eosinophil peroxidase. Eosinophil peroxidase deficiency with normal levels of the neutrophil enzyme has seldom been reported [6]. We report a patient in whom a selective deficiency of eosinophil peroxidase was detected by flow cytochemistry (Technicon H-6000).

A 62-year-old woman was diagnosed as having toxic epidemic syndrome (TES) in June, 1981. Leukocyte count was $11.7 \times 10^9/1$ with a 10% eosinophils. In November 1983, when she was seen at our hospital, the H-6000 report of her peripheral blood showed $6.79 \times 10^9$ leukocytes/1 with 37.6% neutrophils, 26.6% lymphocytes, 33.4% monocytes, 0.3% eosinophils, 1.5% basophils and 0.6% large unstained cells. However, the peripheral smear revealed only 8% monocytes and 30% eosinophils. Two years later the same abnormality was still present. Her eosinophils gave a negative reaction for peroxidase using benzidine di-hydrochloride [7] and for Sudan black B. Neutrophils and monocytes reacted normally to both techniques. The patient refused further testing and no family studies could be performed.

We interpret those results as a congenital or acquired partial deficiency of eosinophil peroxidase. The abnormal eosinophils are read as ‘monocytes’ by the H-6000 (large cells with little peroxidase). Some peroxidase must be reacting in the eosinophils although there is none detectable by optical cytochemistry using benzidine dihydrochloride.

Eosinophilia was a marker for TES [8]. The eosinophils in this disease are similar in optical morphology to those found in our patient. However, no cytochemical abnormalities have been reported in TES. Only 0.17% of patients with TES had more than $1 \times 10^9$ eosinophils/1 4 years after diagnosis.

Neutrophil peroxidase deficiency has been increasingly recognised by automated flow cytochemistry [4, 5]. Optical screening of peripheral smears of patients with low numbers of eosinophils and mildly elevated numbers of monocytes and/or large unstained cells by flow cytochemistry may reveal other cases of eosinophil peroxidase deficiency.

References