Cerebriform (Sézary Like) Mononuclear Cells in Healthy Individuals: A Morphologically Distinct Population of T Cells

Cerebriform mononuclear cells (CMC) resembling those occurring in the skin infiltrate of patients with mycosis fungoides (mycosis cells) and the skin infiltrate and peripheral blood of patients with Sézary's syndrome (Sézary cells) were identified. These CMC are characterized by a high nucleus-cytoplasm ratio, deep and narrow nuclear indentations, condensed chromatin at the nuclear membrane, and a cytoplasm poor in organelles. In human cord blood and peripheral blood of healthy individuals, 6.7 and 8.7% respectively were found to be CMC. These cells invariably form E-rosettes and hence are part of the T-cell population. The occurrence of similar cells in the skin infiltrate of patients allergic to rubber, formalin, and peruvian balsam suggests an expression of cellular immunity mediated by T-cells.

Not all (up to 85%) of the CMC in patients with mycosis fungoides and Sézary's syndrome have T-cell characteristics as shown by E-rosette formation. This suggests the presence of two populations of CMC: one in mycosis fungoides and another in Sézary's syndrome. The relationship of these CMC as seen in healthy individuals with the CMC occurring in mycosis fungoides or Sézary's syndrome is discussed.

Key words: Mycosis fungoides, Sézary's syndrome, Helper T cell, Cerebriform mononuclear cell, Delayed type hypersensitivity.

Introduction

The presence of cerebriform mononuclear cells (CMC) in the skin infiltrate of patients with mycosis fungoides (mycosis cells) and in the blood and skin infiltrate of healthy individuals suggests their role in cellular immunity.
of patients with the Sézary syndrome (Sézary cells) is considered pathognomonic for these diseases.

These cerebriform mononuclear cells are characterized by a high nucleus to cytoplasm ratio, deep and narrow nuclear indentations, condensed chromatin at the nuclear membrane and cytoplasm poor in organelles. These features are best observed by electron microscopy (Brownlee and Murad, 1970; Lutzner et al., 1971; Rosas Uribe et al., 1974).

Recently it has been shown that cerebriform mononuclear cells in mycosis fungoides and Sézary’s syndrome form rosettes spontaneously with uncoated sheep red blood cells (E-rosettes) but not with erythrocytes coated with an antibody complement complex (EAC-rosettes), which indicates that these cells have T-cell membrane characteristics (Broome et al., 1973; Brouet et al., 1974; Edelson et al., 1974). Homing of atypical (cerebriform) mononuclear cells in the paracortical areas of dermatopathic lymph nodes of mycosis fungoides patients in the plaque stage (van Leeuwen et al., 1976) also supports the T-cell nature of cerebriform mononuclear cells in this disease. However in both mycosis fungoides and Sézary’s syndrome some cerebriform mononuclear cells fail to form both E- and EAC rosettes (van Leeuwen et al., 1975; Robinowitz et al., 1976; Zucker Franklin, 1974a; Zucker Franklin et al., 1974b), indicating that they lack both B and T cell membrane characteristics. The nonspecificity of Sézary cells was already questioned before by Flaxman et al. (1971) and Rosas Uribe et al. (1974) who demonstrated similar cells in non-lymphomatous dermatosis as well as in normal spleen and reactive lymph nodes. Membrane characteristics, however, are not mentioned in these studies.

Recently E-rosette forming cerebriform mononuclear cells were demonstrated in synovial fluid (van Leeuwen et al., 1976a) and synovial membranes (de Vries et al., 1977) of rheumatoid arthritis patients. Because higher percentages of cerebriform mononuclear cells were found after in vitro stimulation of human peripheral blood lymphocytes with phytohemagglutinin (PHA, a preferential T-cell stimulator (Wybran et al., 1973) these cells were thought to represent reactive T-cells (Yeckley et al., 1975). If this hypothesis is correct, recirculating cerebriform mononuclear cells should be present in the blood of healthy individuals, because they react under the influence of environmental stimuli.

The present paper describes the presence of cerebriform mononuclear cells with T-cell membrane characteristics in the blood of apparently healthy donors and in human cord blood. Since reactive T-cells should be present in the infiltrates of cell-mediated immune reactions, we also performed ultrastructural studies in an attempt to demonstrate cerebriform mononuclear cells in the dermal infiltrate of delayed-type hypersensitivity reactions. The hypothesis that under normal conditions in man cerebriform mononuclear cells represent a morphologically distinct population of reactive T-cells, is discussed in relation to the occurrence of cerebriform or atypical mononuclear cells in mycosis fungoides and Sézary’s syndrome.

Material

Heparinized blood samples were derived from the umbilical cord of 5 normal healthy infants during delivery and from 6 healthy laboratory workers between 18–51 years. The erythrocyte sedimentation rates and routine blood smears of these samples showed no abnormalities.