

Peripheral Blood in Children

During infancy and childhood, the composition of blood differs significantly from that of adults. Hematologically, a child is not merely a small adult, and children and infants have their own specific blood pictures. In general, the younger the individual, the greater is the deviation from normal adult values and the greater the instability of the blood picture during disease. At birth, the hemoglobin content of red cells is higher than at any subsequent period, and compared with adult values, the number of red cells is increased (a polycythemia) and the cells are macrocytic. An increase in reticulocytes and the presence of nucleated red cells (normoblasts) are characteristic of the normal neonate. Within a few weeks after birth, macrocytes disappear and normal, adult-sized red cells are present. By about the third month of postnatal life, hemoglobin levels drop; accompanied by a small decrease in the number of red cells so that the red cells (as judged against adult standards) are hypochromic. This picture is maintained until about the second year, after which the values for red cells and hemoglobin gradually rise to reach adult levels at puberty. It is only after puberty that the sex differences in red cells and hemoglobin become apparent. The number of leukocytes is much greater in the neonate than in the adult, and neutrophil granulocytes predominate. Most of these cells have only two lobes, many are band forms, and myelocytes and even promyelocytes (immature forms normally found only in bone marrow) may be present. The leukocyte count drops quickly and reaches adult levels by about the third month. From the second week to about the second year, lymphocytes dominate the blood picture rather than neutrophils as in the adult. In disease states, a child's blood is apt to show far greater deviations and variations than occur in adult blood. An infection that in the adult would produce a mild leukocytosis and an increase in band form leukocytes in a child may evoke a leukocytosis of leukemic proportions (leukemoid reaction) with the appearance of myelocytes and promyelocytes. Similarly, anemia in a child may be marked by the presence of nucleated red cells where in the adult only polychromatophilia would occur. Lymphocytosis develops much more readily in children, and platelets are apt to fluctuate wildly.

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