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INFECTION AND ANAEMIA

THESIS

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BY

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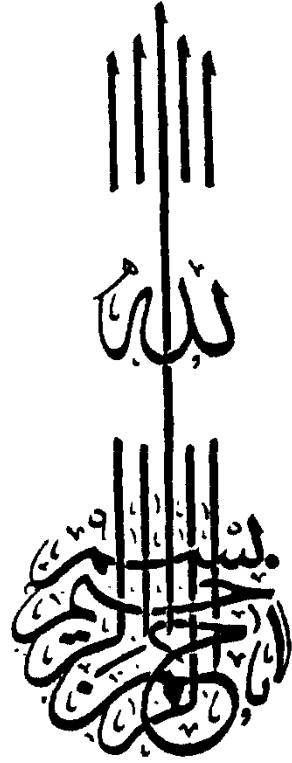
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INTRODUCTION

INTRODUCTION

Bacterial and viral infections whether acute or chronic are commonly associated with anaemia (Smith and Murdoch, 1976). The anaemia is usually normochromic, normocytic although it may sometimes be hypochromic, microcytic. A low serum iron despite normal or increased iron stores is the characteristic of this anaemia (Cartwright and Lee, 1971).

Hypochromic anaemia is commonly observed in patients with severe chronic infection, the hypochromia is not due to a lack of iron available for haemoglobin synthesis as in iron deficiency anaemia, but to defect in reutilization of iron present in the storage sites for haemoglobin synthesis (Wintrobe, et al., 1981).

Infection can produce haemolytic anaemia through a direct damage of the red cell membrane by the infective agent, intravascular haemolysis, transient hypersplenism or through autoimmune mechanism (Dacie, 1967).

Bone marrow depression occurs after certain bacterial and viral infections and a aplastic anaemia may develop (Barrett - Connor, 1972).

These anaemias do not respond to treatment with haematinics until the infection has been controlled (Smith, 1974).

On the other hand anaemia may be associated with increased susceptibility to serious infections as in sickle cell anaemia. The factors accounting for this susceptibility include : functional asplenia and defect in the immune mechanisms (Powers et al., 1983).

AIM OF THE WORK

The aim of this work is to review and assess the relationship between bacterial and viral infections whether acute or chronic and different types of anaemias.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

Types of infections commonly causing anaemia :

The commonest infections causing anaemia are pulmonary infections as lung abscess, empyema, suppurative bronchiectasis, pneumonia, and tuberculosis, sub-acute bacterial endocarditis, urinary tract infections, pelvic inflammatory disease as purperal infections, osteomyelitis, typhoid, brucellosis, meningitis, chronic skin ulceration with discharging sinus and certain chronic fungual diseases (Cartwright and Wintrobe, 1952), (Wintrobe, et al., 1981).

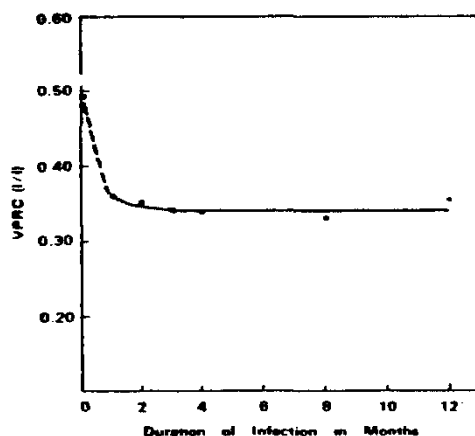
The clinical features :

Since this type of anaemia occurs in association with so many diseases, the clinical manifestations necessarily vary widely. Usually the signs and symptoms of the underlying disorder overshadow those of the anaemia. Rarely, the anaemia is the presenting manifestation as in some case of bacterial endocarditis (Penington, et al., 1978).

Characteristics of the anaemia associated with
infections :

Development and severity :

The anaemia of infection is usually of mild or moderate severity, developing during the first one to two months of illness and thereafter does not progress (Cartwright, 1966). Severe anaemia is rare, except with septicemia and overwhelming infections, and its occurrence in patient with infection should suggest the presence of another cause for anaemia e.g. blood loss or renal failure . In general the degree of anaemia tends to be more marked with more severe infection and of longer duration. The volume packed red cells is maintained between 30 and 40 % the total blood volume is below normal . Haemoglobin values generally range from 9 to 12 gm/dl (Cartwright and Lee, 1971).

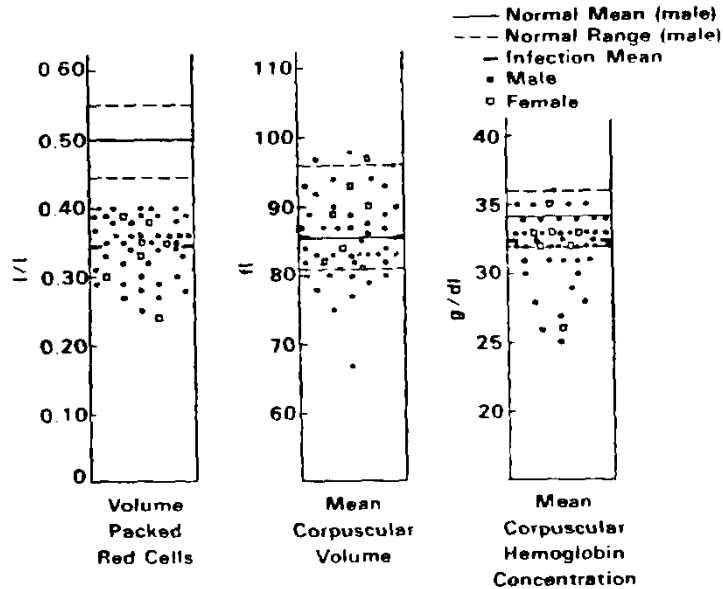


The development of anemia, as measured by the volume of packed red cells (VPRC), in 50 patients with chronic infections (From Cartwright GE. The anemia of chronic disorders. *Semin Hematol* 3:351, 1966.)

Quoted from Wintrobe, et al., 1981.

Morphological features :

The anaemia is usually normocytic normochromic. However, hypochromic anaemia (MCHC 26 to 32 gm/dl) has been observed in 23 to 50% of patients with chronic infection. Microcytosis is encountered less often than hypochromia and, when present, is usually not as great as is commonly found in iron deficiency anaemia. Values for MCV below 72 fl. are rare (Cartwright, 1966; Cartwright and Lee, 1971).



Degree and type of anemia, as indicated by the volume of packed red cells, the mean corpuscular volume and the mean corpuscular hemoglobin concentration in 50 patients with anemia due to infection. (From Cartwright GE, Wintrobe MM. The anemia of infection. Adv Intern Med 5:165, 1952.)

Quoted from Wintrobe, et al., 1981.

Anisocytosis of moderate degree may be detected, but poikilocytosis is slight. The reticulocytes are normal or reduced in number during the time when the anaemia is slowly developing. Examination of the peripheral smear fails to reveal such evidences of exaggerated erythrocyte regeneration as polychromatophilia and nucleated red blood cells (Cartwright, 1966 ; Wintrobe, et al., 1981).

The bone marrow :

The bone marrow is of normal or moderately increased cellularity. The myeloiderythroid ratio may be increased, but whether this is due to increased granulopoiesis or decreased erythropoiesis or both is uncertain. In the bone marrow aspirates stained for iron, sideroblasts are found to be reduced to 5 to 20% of the total normoblasts (normal, 30 to 50%). In contrast, hemosiderin within macrophages usually is increased; exceptions probably represent cases complicated by iron deficiency anaemia (Cartwright, 1966 ; and Enslin, 1972).

Iron metabolism :

In patients with this type of anaemia there is a profound disturbance in iron metabolism as manifested by a decreased rate of iron utilization for hemoglobin synthesis, a persistently low level of iron in the plasma, decreased total iron binding capacity of the serum and transferrin saturation, a minimal rise in plasma iron following the oral administration of iron and rapid removal of injected iron from the blood stream (Smith, 1974).