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Blood Rheology In Different Types Of Primary Glomerular Diseases

Thesis
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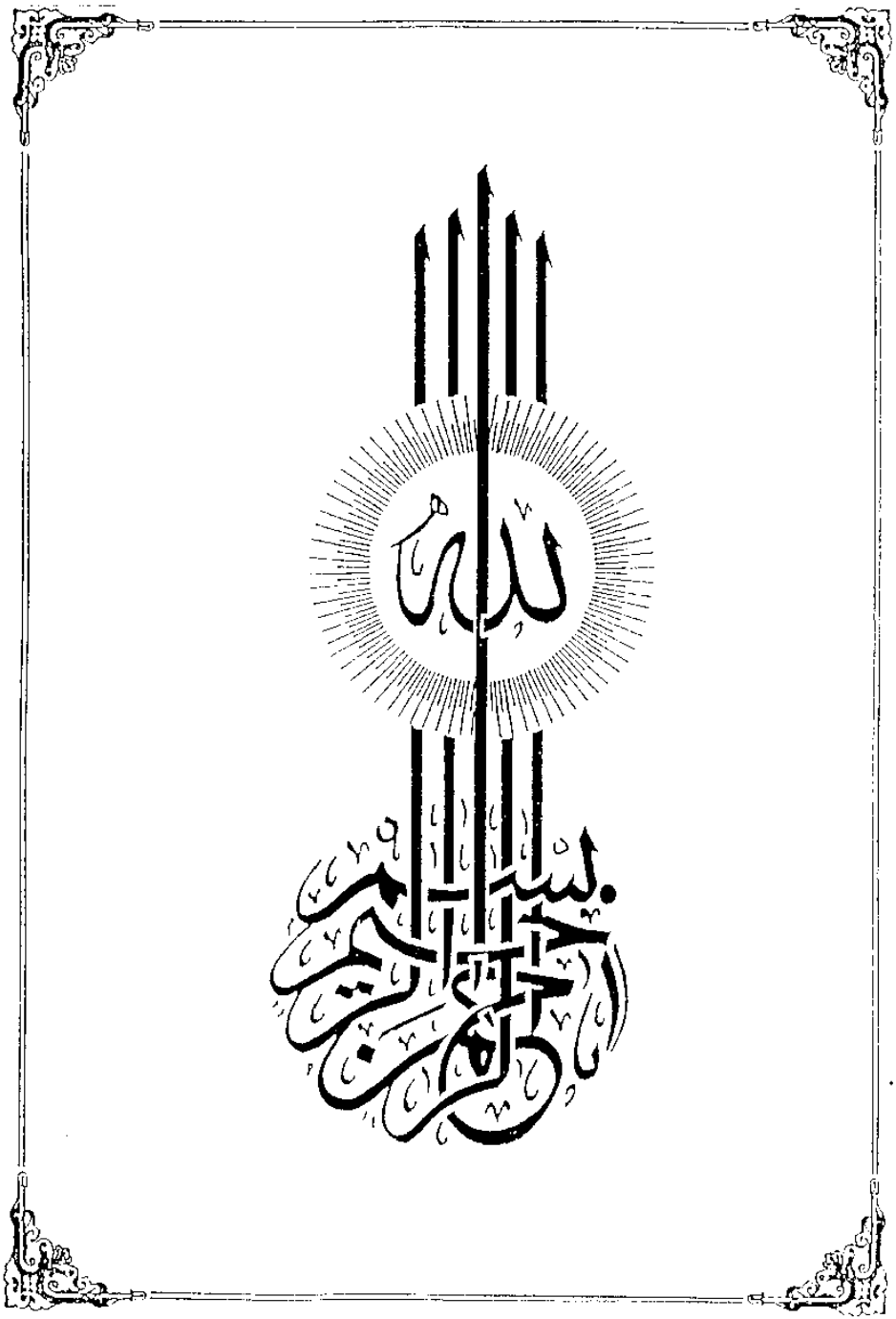

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Mohamed El-Sawy

Introduction and Aim of work

Introduction And Aim Of The Work

The immunopathogenic mechanisms in different types of primary glomerular diseases remain a subject of considerable debate, although it is generally accepted that most of them have immune complex etiology ***(Clarkson et al., 1984).***

Probably, other contributing factors may play a role, either in accentuating immunopathogenic mechanisms, or altering the hemodynamic state of the affected nephron causing further accentuation of the disease or further deterioration in glomerular functions.

Among these factors, blood viscosity and red blood cell deformability were found to be significantly altered in patients with IgA nephropathy and a positive correlation was found between these parameters with the severity of histological findings, and, with the glomerular filtration rate ***(Shand et al., 1988).***

The aim of this work is to study a similar correlation between hemorheological indices in different types of primary glomerulonephritidis.

Review of Literature

Physiology of red blood cell and erythropoiesis

Bone marrow in the adult occupies the vertebrae, sternum, ribs, pelvic bones, and to a lesser extent, the long bones and the skull. It comprises about 1 kg of tissue. Normal bone marrow consists of about 50 % hematopoietic cells and about 50 % fat, with the hematopoietic cells being arranged in cords around sinusoids ***(Andreoli et al., 1986).***

The understanding of blood cell formation, or hematopoiesis, has been greatly enhanced by recent advances in cell culture techniques and the application of recombinant DNA technology. The cloning and characterization of an array of hematopoietic growth factors have provided new insights into the regulation of production and the biologic function of hematopoietic cells. Several of these recombinant proteins have now been produced on a large scale and have made the transition from the laboratory bench to the bedside, where clinical applications are being investigated extensively ***(Goldberg and Bunn, 1994).***

Hematopoietic Stem Cells :-

All the cells circulating in the blood are descendants from a very small number of pleuripotent stem cells. These ancestral cells, which comprise less than 0.01 % of the

nucleated cells in the bone marrow, are capable of restoring normal hematopoiesis in irradiated animals and in patients with bone marrow aplasia. The pleuripotent stem cell has the unique capacity for self-renewal and the potential for growth and differentiation along granulocytic, monocytic, erythroid, megakaryocytic, and lymphoid lineages ***(Bagby and Segal, 1991).***

Some stem cells divide and give rise to progeny that lose their ability to differentiate along multiple pathways and become committed to a specific hematopoietic lineage. These committed progenitor cells continue to proliferate and differentiate into morphologically identifiable precursor cells which then undergo terminal maturation, thereby developing highly specialized functions and losing their ability to proliferate ***(Crawford et al., 1991).***

Techniques have been developed which support the growth and differentiation of hematopoietic progenitor cells in vitro. Using these techniques, hematopoietic colonies of mixed and single lineages have been identified and characterized with respect to the factors required for their growth. These hematopoietic colonies are termed colony forming units (CFU) or burst forming units (BFU), with the specific type of colony designated by suffixes indicating the constituent cell type ***(Goldberg and Bunn, 1994).***