SERUM AND URINE B_2 MICROGLOBULIN LEVELS IN NUTRITIONAL RICKETS

THESIS

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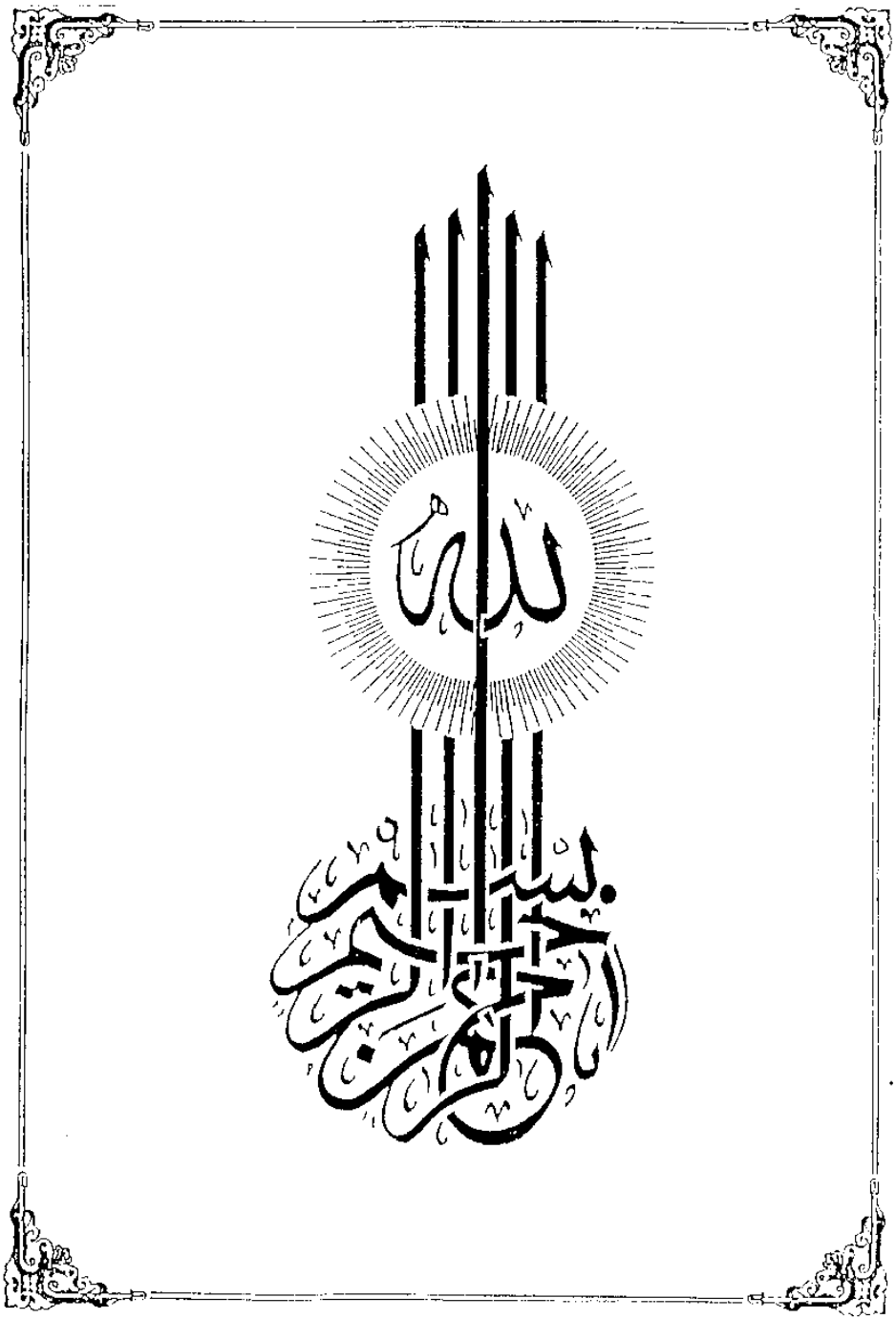

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Review of Literature

INTRODUCTION AND AIM OF THE WORK

B_2 M. is a low molecular weight protein which is present on surface of all nucleated cells of the body, except the red blood cells and trophoblasts. It is filtered by the glomeruli and then nearly completely re-absorbed and catabolised by the proximal tubules (Karlsson et al., 1980).

Its serum level is nearly constant and not affected by age or sex (Evrin et al., 1972). Rising of the serum level may occur in two occasions: First, impairement of the glomerular filtration rate and the second, in some chronic inflammatory diseases and some malignancies where there is increased synthesis. (Karlsson et al., 1980).

Proximal tubular dysfunction leads to an increased urinary concentration of the protein (Karlsson et al., 1980).

Many studies have demonstrated tubular dysfunction in vitamin D deficiency, in the form of amino-aciduria and phosphaturia (Fraser et al., 1967).

The aim of the present work is to study B_2 M. in vitamin D deficiency rickets.

B_2 M. as a criteria of tubular function will be estimated in both serum and urine before and after treatment.

HISTORICAL APPROACH

B_2 Microglobulin (B_2M) was first isolated in 1964 and characterised in 1968 by Beggard and Bearn. This protein was isolated for the first time from the urine in patients with Wilsons' disease and chronic cadium poisoning (Beggard and Bearn, 1968).

Structure of B_2 microglobulin:

B_2M. is a globular protein devoid of carbohydrate, it is of low molecular weight (11,800 Dalton) (Beggard & Bearn, 1968), composed of a single 100 amino acids peptides with one intra-chain disulphyde bridge.

Human B_2M., has also the same number of amino-acids like rabbit and mouse homologues.

Amino acids sequence analysis indicates that the molecule has been highly conserved during evolution (Beggard & Bearn 1968).

There is a common evolutionary origin for B_2M. and immunoglobin G (Ig G), in the amino acid sequence in both proteins. This was explained by that the gene for B_2M., arises as a result of a large deletion in an Ig G like gene (Smithices and Poulik, 1972).

B_2M. is related to both immune system and human leucocytic antigen (HLA). It exhibits homology with the constant domains of the immunoglobulin G (Ig G) light and heavy chains, and is an integral part of the heavy chains surface (Jack, 1980).

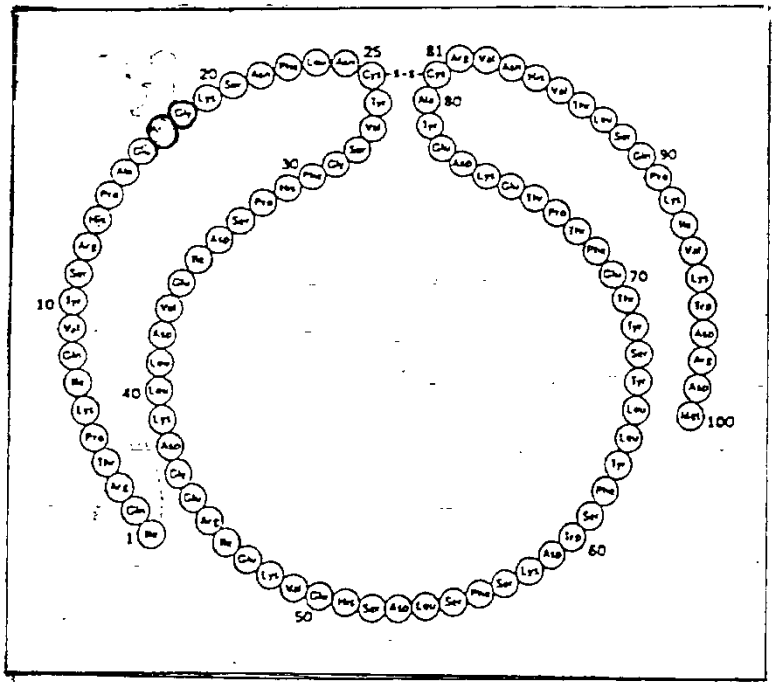

Figure I

Structure of B_2microglobulin

(Revillard, 1979)