ASSESSMENT OF TUBULAR AND GLOMERULAR FUNCTION IN PREGNANCY INDUCED HYPERTENSION BY B_2-MICROGLOBULIN ESTIMATION

THESIS

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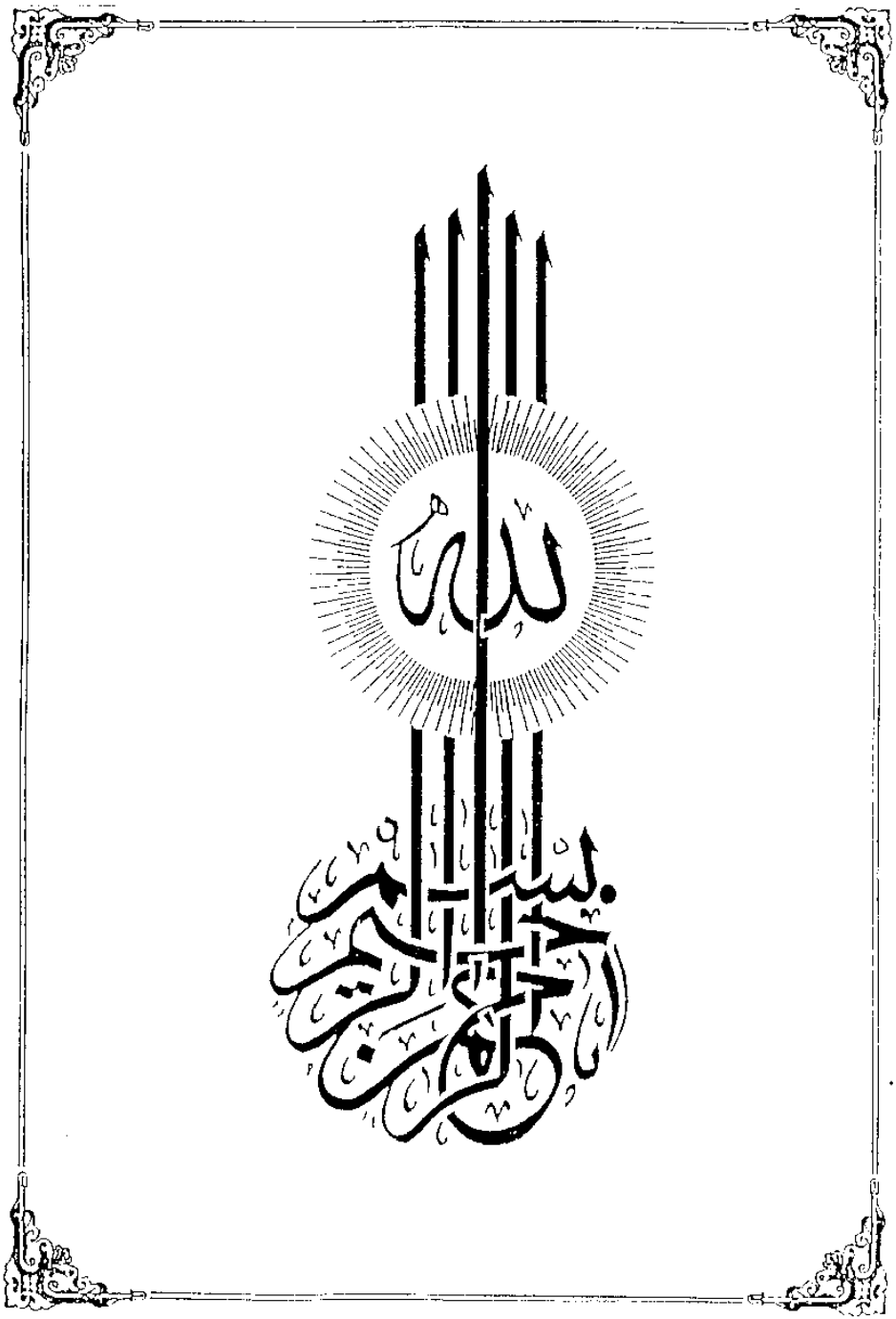
TO

MY

FATHER



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ABBREVIATIONS

AIDS	Acquired immunodeficiency syndrome.
B_2-m	Beta$_2$ microglobulin.
BUN	Blood urea nitrogen.
CEA	Carcino embryonic antigen.
CNS	Central nervous system.
Cr	Creatinine.
Cr Cl	Creatinine clearance.
CS	Caesarean section.
CSF	Cerebrospinal fluid.
EPH	Edema proteinuria hypertension.
GFR	Glomerular filtration rate
gp	Group.
HLA	Histocompatibility cell bound leucocytic antigens
HPL	Human placental lactogen.
Ig	Immunoglobulins.
L/S	Lecithin syphingomyelin ratio.
LMP	Last menstrual period.
mg	10^{-3} gm.
NAG	N-acetyl-beta-D-glucosaminidase.
No.	Number.
p	Probability.
PET	Pre-eclamptic toxaemia.
PIH	Pregnancy induced hypertension.
PPD	Purified protein derivative.

PSL	Peak serum level.
r	Correlation coefficient.
S	Serum.
SD	Standard deviation.
Spont.	Spontaneous.
t	Student test.
U	Urinary.
UA	Uric acid.
ug	Microgram (10-6 gram).
w	Week
wt	Weight.

CONTENTS

INTRODUCTION

INTRODUCTION

The nature of the renal lesion(s) in pregnancy-induced hypertension is uncertain. Certain characteristic light and electron microscopic changes in the glomeruli have been described in association with proteinuria (though not in the presence of hypertension alone), and the term "glomerular endotheliosis" has been applied (Spargo et al., 1959 and Chesley, 1978). However, these changes are not found universally, nor are they specific for pre-eclampsia. Lipid deposition has been noted in some patients in the renal tubules, but only after some days of heavy proteinuria (5 to 10 g/24 hours).

Previous studies of the composition of the urinary proteins have led to the conclusion that the proteinuria of pre-eclampsia is attributable entirely to increased glomerular permeability with little evidence of defective tubular reabsorption (Spargo et al., 1959).

In recent years more sensitive indicators of renal tubular dysfunction have become available including B_2-M, a small protein of molecular weight 11,800, which is released at a constant rate from cell membrane as a result of membrane turnover (Hall, 1979). B_2-m is freely filtered at

the glomerulus and normally almost entirely (greater than 99.9%) reabsorbed and hydrolyzed by the proximal convoluted tubular epithelium. Whereas serum B_2-m levels are an accurate measurement of glomerular filtration rate (Jialal, et al., 1982), increased urinary B_2-m levels are the most sensitive and specific known parameter of renal proximal tubular dysfunction (Revillard, 1979).

AIM OF THE WORK

This work attempts to evaluate B_2-microglobulin in assessment of renal affection , whether glomerular or tubular, in pregnancy induced hypertension in comparison to serum creatinine and serum uric acid.

REVIEW OF LITERATURE

B_2-MICROGLOBULIN

B_2-Microglobulin (B_2-m) was first isolated and characterized in 1968 by Berggard and Bearn. The protein was initially isolated from the urine of patients with Wilson's disease and chronic cadmium poisoning.

Structure of B_2-microglobulin:

As defined by Berggard and Bearn, B_2-m is a globular protein devoid of carbohydrate with a molecular weight of 11800 daltons. It is composed of 100 amino acid peptide chain with an interchain disulfide bridge (position 25 - 81) ecompassing 57 residues. (Figure: 1)

Its amino acid sequence and three dimensional structure bear a striking homology with the constant domains of heavy and light chains of immunoglobulins (Igs) especially with the (CH_3) of the constant domain of heavy chain of (IgG) (Cunningham et al., 1973). Although the chemical structure of B_2-m is related to Igs yet the antigenicity is different (Revillard and Vincent 1980) (Figure: 2)

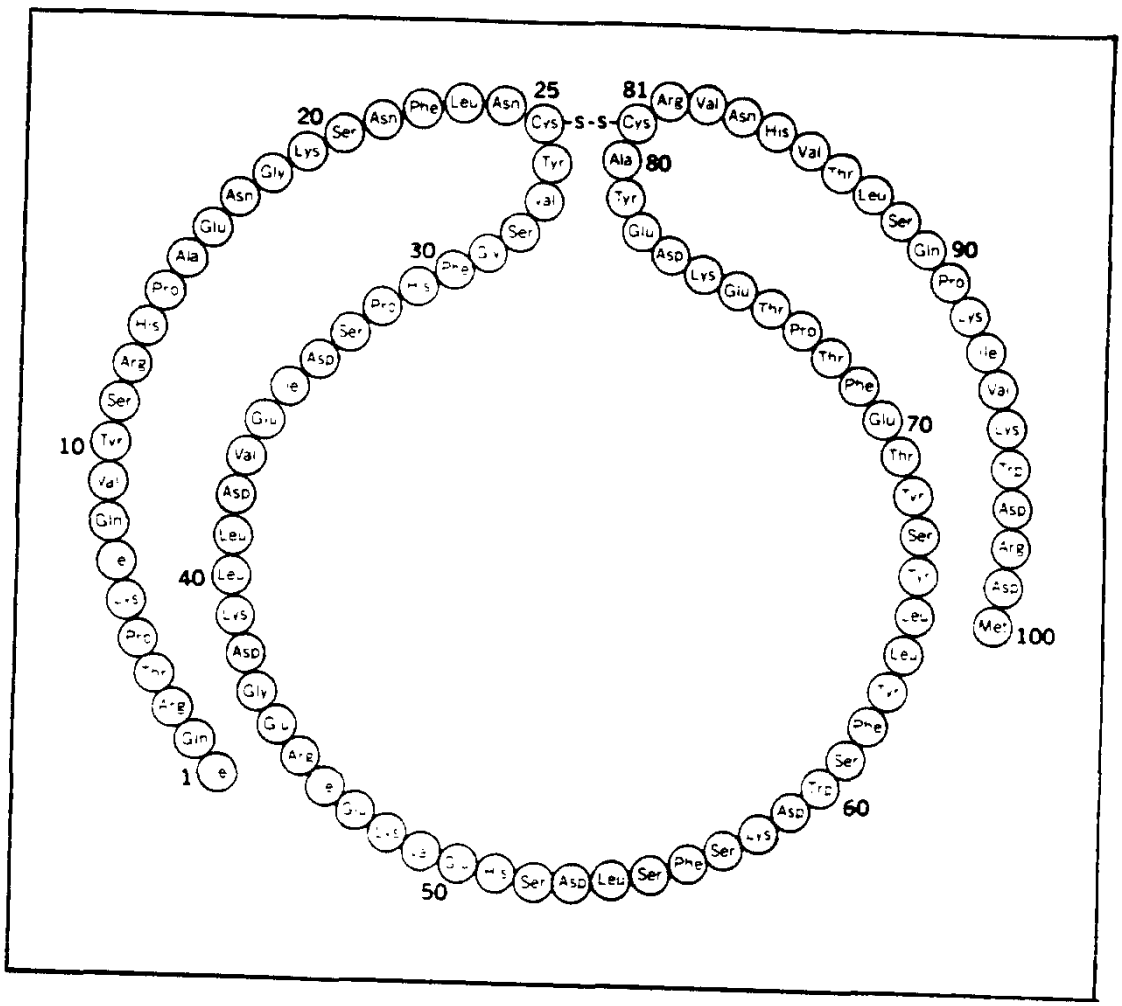

Figure: 1 Structure of B2-microglobulin

(Berggard & Bearn 1968)

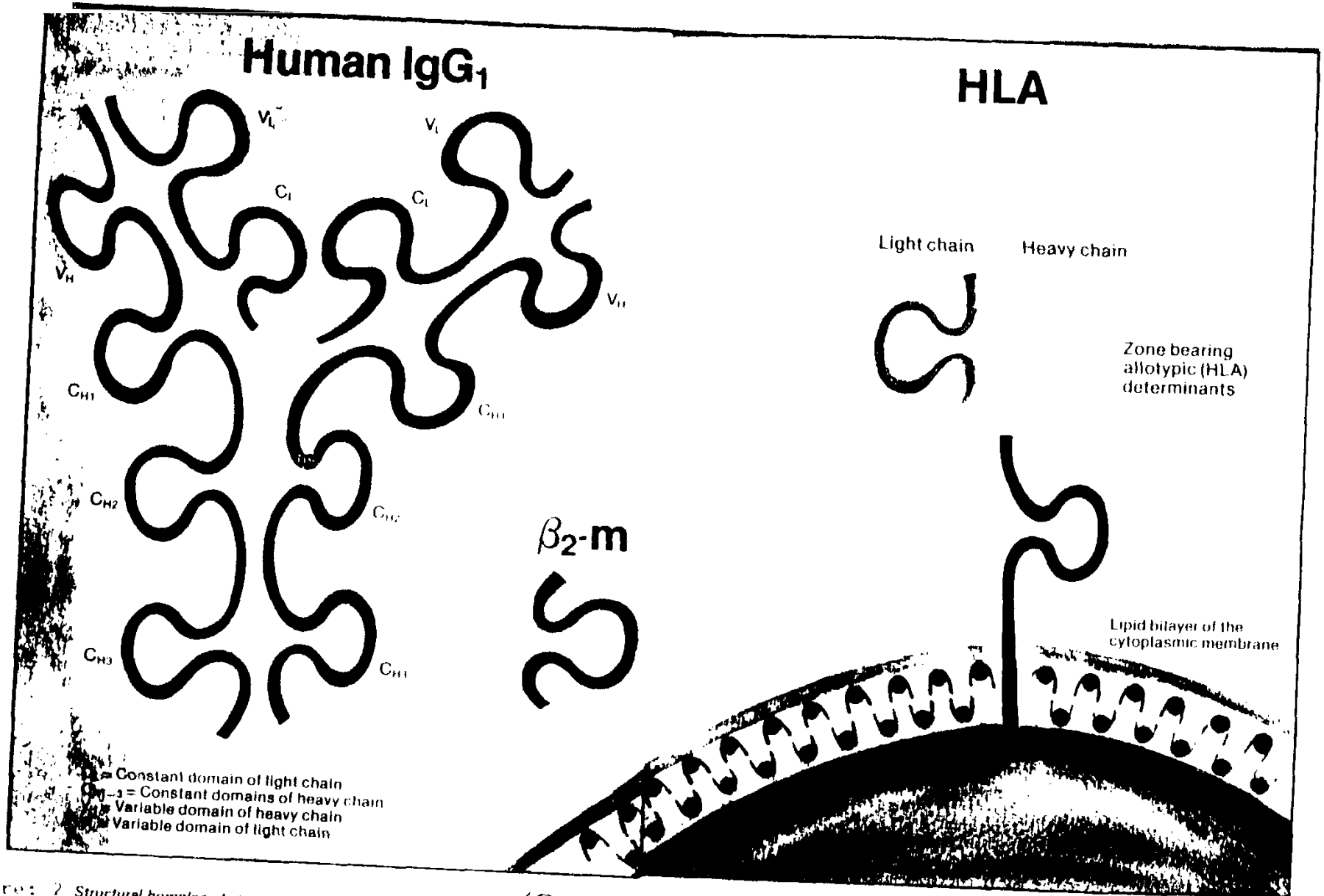

Figure: 2 *Structural homology between IgG , β_2-m and HLA*

(Revillard & Vincent 1980)