# SERUM HAPTOGLOBIN IN NEPHROTIC SYNDROME

*T H E S I S*

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***the Master Degree of Pediatrics***


By

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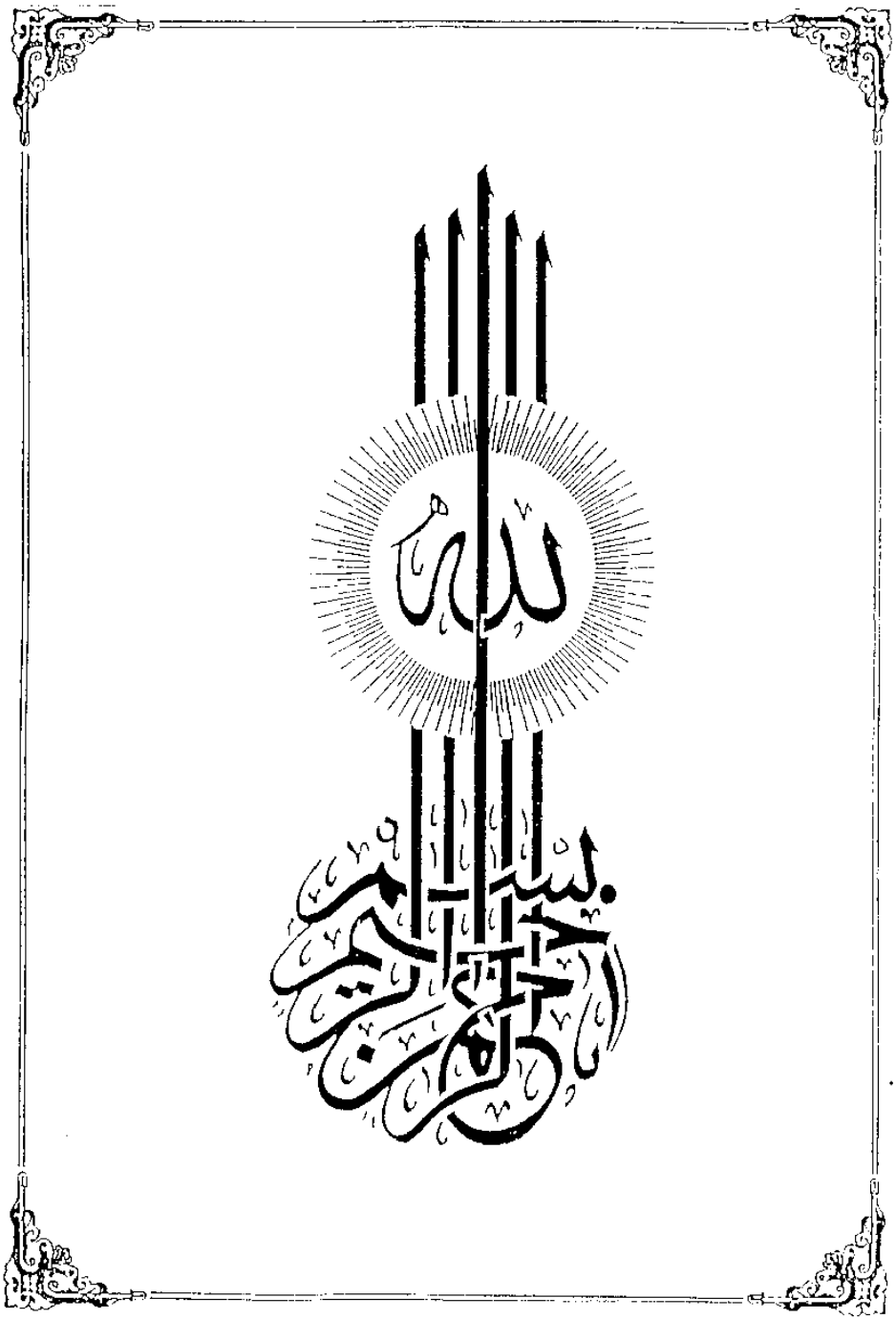

# ABBREVIATIONS

| | |
|---|---|
| Alpha | = $\alpha$ |
| Beta | = $\beta$ |
| Figure | = Fig. |
| Gram | = gm.(g.) |
| Haptoglobin | = Hp |
| Hemoglobin | = Hb |
| Hour | = hr. |
| International Study of Kidney Diseases in Children | = I.S.K.D.C. |
| Immunoglobulin | = Ig |
| Kilogram | = kg. |
| Less than | = < |
| Litre | = L |
| Meter | = M |
| Milligram | = mg |
| Minimal change Nephrotic Syndrome | = M.C.N.S. |
| More than | = > |
| Number | = No. |
| Probability | = P |
| Standard Deviation | = S.D. |

C O N T E N T S



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# T A B L E S

F I G U R E S

# Introduction
# &
# AIM OF WORK

# INTRODUCTION AND AIM OF THE WORK

The nephrotic syndrome is a common disease of children that may occur at any time in the course of many different primary and secondary glomerular diseases that share an abnormal increase in permeability of the glomerular basement membrane to proteins with marked proteinuria (Rubin, 1981).

The nephrotic syndrome is characterized by edema, hypoproteinemia (with serum albumin levels usually below 2 gm/dl), hyperlipidemia (with serum cholesterol levels above 220 mg/dl), and marked proteinuria (2 gm/$M^2$/24 hr. or more) (Nelson et al., 1983).

The syndrome may occur as a single episode, transient or persistent, or be marked by numerous recurrences interspersed with remissions (Rubin, 1975).

Hapatoglobins are a group of serum proteins with the mobility of $\alpha_2$-globulins. They have the characteristic property of combining with hemoglobin and related chromoproteins (Yoshioka and Atassi, 1986).

Changes in the concentration of haptoglobin in plasma or serum have been reported in a number of conditions. Haptoglobins are the chief component of the "acute phase" proteins. Their concentration increases up to several-fold during inflammatory reactions (Courtoy

et al., 1981). Changes in their concentration have also been reported in infections, connective tissue disorders, neoplasia, blood disorders, hepatobiliary diseases, alimentary tract diseases, cardiovascular diseases, metabolic diseases and renal diseases (Owen et al., 1964).

As regards renal disorders, few reports were recorded on haptoglobin changes in various renal diseases and especially in nephrotic syndrome which is a common renal disorder.

So the aim of this work is to assess the value of haptoglobin estimation in cases of nephrotic syndrome.

# Review of Literature

# NEPHROTIC SYNDROME

Nephrotic syndrome is a clinical manifestation that may occur at any time in the course of many different primary and secondary glomerular diseases that share an abnormal increase in permeability of the glomerular basement membrane to protein, with marked proteinuria (Rubin, 1981).

It is characterized by edema, hypoproteinemia(with serum albumin levels usually below 2 g/dL),hyperlipidemia (with serum cholesterol levels above 220 mg/dl) and marked proteinuria (2 gm/$M^2$/24 hr. or more) which is the essential feature of the syndrome (Nelson et al.,1983).

At varying stages and degrees of severity of the syndrome, there may be no edema, and the proteinuria may be minimal and intermittent, these changes occurring spontaneously or altered by treatment. The syndrome may occur as a single episode, transient or persistent, or be marked by numerous recurrences interspersed with remissions (Rubin, 1975).

The annual incidence of nephrotic syndrome in the United States in children less than 16 years of age is 2 per 100,000 children, and the cumulative prevalence is 16 per 100,000 children (Schlesinger et al.,1968).

A familial tendency to acquire nephrotic syndrome has been reported in 2 to 8% of cases (White, 1973). Familial involvement is most often confined to siblings, who have been established to have an incidence 1000 times greater than the general population (Makker and Heymann, 1974).

## CLASSIFICATION OF THE NEPHROTIC SYNDROME

The nephrotic syndrome associated with primary glomerular diseases is termed primary nephrotic syndrome. When it occurs as part of a recognized systemic disease or results from some evident cause , it is termed secondary nephrotic syndrome (Barnett, 1978).

Approximately 90% of the nephrotic syndrome in children results from primary glomerular disease and 10% is secondary to systemic disease (McEnery and Strife,1982).

(A) Primary (Idiopathic):

1. Minimal change nephropathy (MCNS)
2. Focal glomerulosclerosis.
3. Diffuse mesangial proliferation.
4. Membranous glomerulopathy
5. Membranoproliferative glomerulonephritis.
6. Congenital nephrosis.

(B) Secondary:

1. Infections : Syphilis, malaria, poststreptococcal glomerulonephritis, subacute bact. end.
2. Toxins : mercurials, bismuth, gold, probenicid, renographic medium.
3. Allergies : poison oak, bee sting, serum sickness, inhaled pollens, food allergy.
4. Cardiovascular: Sickle cell disease, renal vein thrombosis, passive congestive heart failure.
5. Malignancies: Hodgkin's disease, leukaemia, carcinoma.
6. Other : Amyloidosis, Diabetes mellitus, systemic lupus erythromatosus, anaphylactoid purpura.

In some of these secondary forms, immunopathogenetic mechanisms identical to those operative in the immune complex glomerulonephritis group of primary nephrotic syndrome can be identified, in others the mechanism of glomerular basement membrane injury is unknown. The most evident clinical features are frequently not those of the nephrotic syndrome (Nelson et al., 1983).

## ETIOLOGY OF THE NEPHROTIC SYNDROME

The cause of the primary forms of the nephrotic syndrome, most commonly seen ir childhood, is unknown. Among the secondary forms there are those with known cause, such as those occurring in congenital syphilis, malaria as a result of nephrotoxic agents, and those where the cause is unknown , such as those occurring with Henoch-Schonlein purpura nephritis, membranoproliferative glomerulonephritis and others (Rubin,1975).

The cause of minimal change nephrotic syndrome remains unclear although several immunologic mechanisms have been postulated. Relapses of the disease have been reported in association with seasonal allergies (Reeves et al.,1975) or with atopic disease (Tromopeter et al., 1980), and others have noted elevated serum IgE concentrations in children with minimal change nephrotic syndrome (Groshong et al.,1973). Evidence that immune complexes are responsible for minimal change nephropathy is essentially lacking. Although immune complexes have been found in serum from some patients with minimal change nephrotic syndrome (Levinsky et al., 1978) the levels of complement components, with the exception of $C1_q$, are normal (Lewis et al.,1971) and there is no evidence for immune complex deposition in renal tissue by immunofluorescent or electron microscopy (Michael et al.,1973).