A STUDY OF COAGULATION DISORDERS IN SEVERE PREGNANCY INDUCED HYPERTENSION

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By

MOHAMED YOUSEF MOHAMED RAGAB

SUPERVISORS

Professor ALI MAREI MAKHLOUF
Professor of Obstetrics & Gynaecology
Ain Shams University

Dr. SAMEH ABDEL HAFEZ
Lecturer of Obstetrics & Gynaecology
Ain Shams University

Dr. SALWA MOHAMED ABUL HANA
Lecturer of Clinical Pathology
Ain Shams University

FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY
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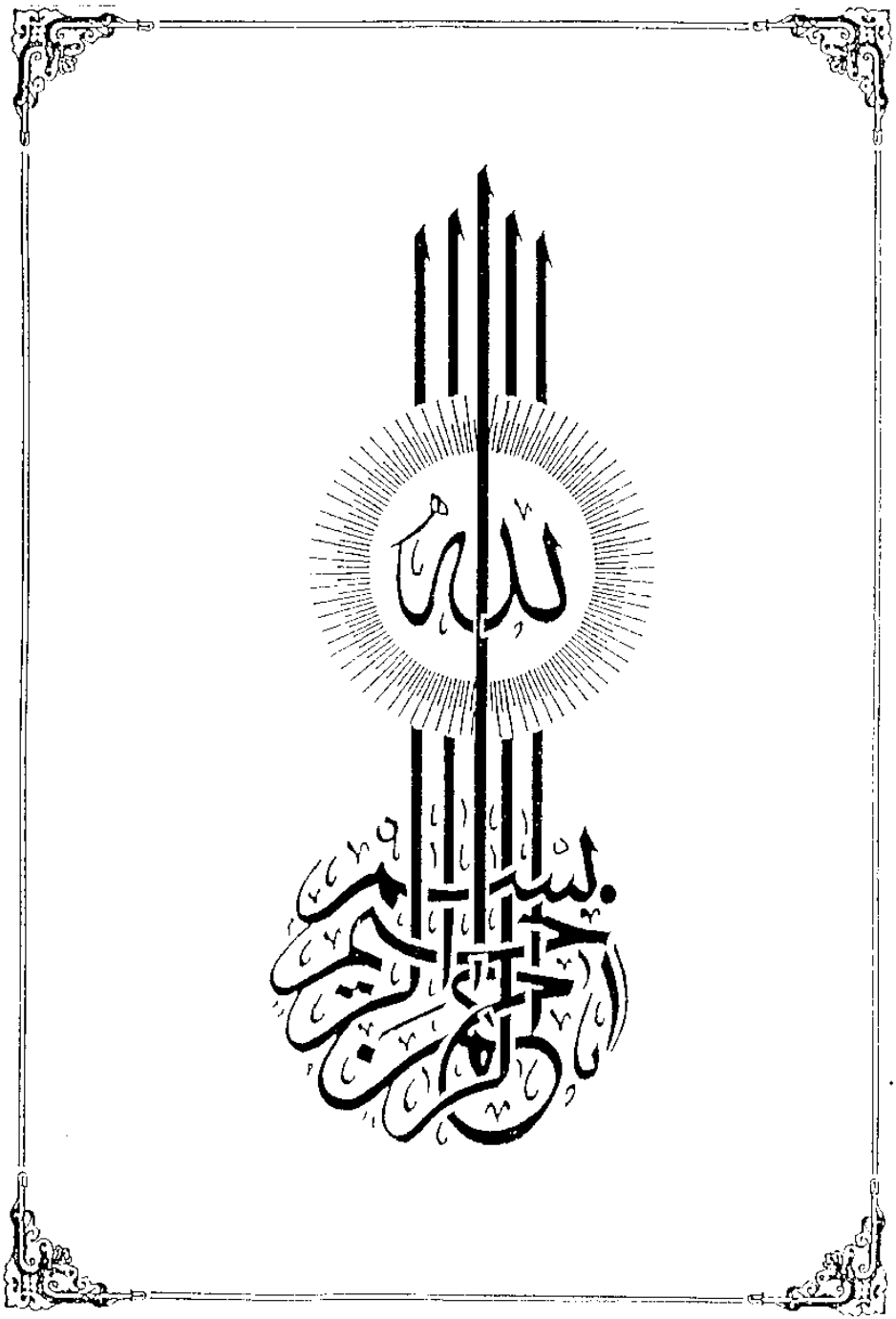

C O N T E N T S

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INTRODUCTION

AND

AIM OF THE WORK

I N T R O D U C T I O N

Pregnancy induced hypertension is a multisystem disease. It occurs in the second half of pregnancy and regresses after delivery. Its cause is not yet known but is probably secondary to a uteroplacental disorder affecting specific maternal target systems. It includes gestational hypertension and pre-eclampsia / eclampsia.

Pregnancy induced hypertension (PIH) is classified into mild and severe disease. Severe PIH is characterized by a diastolic blood pressure (DBP) of 110 mm mercury or more. Imminent eclampsia is defined as a DBP of 90 mm mercury or more associated with sever headache, visual disturbances, epigastric pain, nausea or vomiting, presence of proteinuria of 3 grams or more per twenty four hours, oliguria or unequivocal hyperreflexia.

In normal pregnancy changes in the coagulation

system are consistent with a low grade process of coagulant activity. Fibrin deposition occurs in the intervillous space of the placenta and in the walls of the spiral arterioles. As pregnancy advances the elastic lamina and smooth muscles of these spiral arteriols are replaced by a matrix containing fibrin. In the early PIH there is a chronic process of fibrin deposition and increased factor VIII consumption but the condition is fully compensated. In severe PIH, however, consumption of coagulation factors VII and VIII, fibrinogen and elevation of fibrin / fibrinogen degradation products (FDPs) together with a reduced platelet count are associated with severe systemic disturbances as a result of fibrin deposition in the microcirculation. This process is termed disseminated intravascular coagulation (DIC). The diminished platelet count and raised fibrin / FDPs can therefore be used to monitor the course of the disease. An elevated plasma uric acid is an established diagnostic investigation of early PIH and precedes the development of proteinuria. Haemoconcentration is another predictive indication of the severity and progress of PIH (Cauchi, 1984; and Redman, 1989).

AIM OF THE STUDY :

The objective of this work is to study the disseminated intravascular coagulation (DIC) profile which includes serum fibrin degradation products (FDPs), plasma fibrinogen, platelet counts, and prothrombin time, and also the laboratory indicies which include uric acid, hematocrit value and liver enzymes estimations in sever pre-eclampsia patients in comparison with normal pregnant women as controls and correlat the results with each others. Postpartum measurment 24 hours and 2 weeks postdelivery will be performed to study the changes in the DIC profile.

REVIEW OF LITERATURE

HYPERTENSIVE DISORDERS

IN PREGNANCY

DEFINITION :

Hypertension in pregnancy is the most significant complication a pregnant woman encounters in the world today. Unfortunately, the hypertensive disorders mainly pre-eclampsia and its sequelae, are the leading cause of maternal deaths in many parts of the world. They also weight heavily in fetal and neonatal morbidity and mortality (Chesley, 1984).

CLASSIFICATION :

Pritchard et al., (1985), had classified hypertensive disorders in pregnancy as follows :

I. Pregnancy induced hypertension :

a- Without proteinuria or generalised gross oedema.

b- With proteinuria or generalised oedema (pre-eclampsia).

* Mild. * Severe.

c- Eclampsia.

II. Chronic hypertension antedating pregnancy.

III. Chronic hypertension with superimposed pregnancy induced hypertension.

a- Superimposed pre-eclampsia.

b- Superimposed eclampsia.

Pre-eclampsia is calssified as mild or severe. It is regarded as severe when one or more of the following is found :

Abnormality	Mild	severe
Diastolic blood pressure	<110 mmHg	110 mmHg or higher
protein uria	Trace to 1+	persistent 2+ or more
Oliguria	absent	present
Headache	absent	present
Visual disturbance	absent	present
Epigastric pain	absent	present
Serum creatinine	normal	elevated
Thrombocytopenia	absent	present
Hyperbilirubinemia	absent	present
SGOT elevation	minimal	marked
Fetal growth retardation	absent	obvious

PATHOLOGICAL CHANGES IN PIH :

Vasospasm is basic to the disease process of sever pre-eclampsia / eclampsia. It is noted as an alternation of the size of arterioles in the nail bed, bulbar conjunctiva and retina with evidence of segmental spasm that produced alternate regions of contraction and dilatation. The vascular constriction imposis a resistance to blood flow and account for hypertension and produces a noxious effect on the blood vessels themselves as well as the organ they supply (Brunnar & Gavras, 1975).

The brain showed haematologic findings ranged from multiple cortical petechial haemorrhages to massive haemorrhages in the subcortex, basal ganglia, and pons. Multiple thrombi and nonhaemorrhagic softening may be seen. Endocrine glands showed necrosis and haemorrhages especially seen in the pituitary, pancreas and adrenal glands.

The myocardium shows thrombosis, fibrinoid deposits and haemorrhages. The lungs shows vascular thrombosis, multiple small haemorrhages with secondary bronchopneumonia may be seen in severe cases (Hibbard, 1988).

I. UTEROPLACENTAL BED :

Three main vascular changes are discribed :

(1) Failure of normal physiological changes in pre-eclampsia :

In early normal pregnancy and again between 12-14 weeks. cytotrophoblastic cells proliferate and invade the intradecidual portion of the spiral arteries. They spread up the lumen, invade the vessel wall, replace the maternal endothelium and destroy the elastic and muscular tissue which is replaced by fibrinoid material. This process opens up the spiral arteries, increasing blood flow and at the same time makes them unresponsive to normal vasoconstrictive stimuli.

Brosens et al., (1972); and Robertson, (1976), on the basis of placental bed biopsies they reported that in pre-eclampsia there is a failure in the second wave of trophoblastic invasion so that the muscle-elastic media of the spiral arteries in the myometrium is retained. The vessels fail to dilate and remain responsive to vasoconstrictive stimuli resulting in a decreased choriodecidual blood flow.

(2) Acute atherosis :

Zeek and Assali, (1950); and de Wolf et al., (1975), reported that in some spiral arteries there is an accumulation of lipid in the muscle cell of the media and intema, which may be followed by necrosis releasing the lipid which is then taken by macrophage to produce lesions which appear like atheroma. These changes may be associated with thrombosis and organization of the thrombi, resulting in vascular occlusion and placental infarction.

(3) Hyperplasia and arteriosclerosis of the basal arteries :

The placenta is smaller than expected with increased number and extent of infarcts.

UTEROPLACENTAL PERFUSION :

compromised maternal placental perfusion is almost certainly a major culprit in the genesis of the increased perinatal mortality and morbidity associated with pregnancies complicated by pre-eclampsia (Pritchard et al., 1985).

Placental perfusion measured directly using nitrous oxide method through direct cannulation of the uterine vein or 24 Na clearance technique through insertion of a needle into the intervillous space showed that the uterine blood flow in the normal term pregnant women is approximately 500-700 ml/m (Browne & Veal, 1953; and Metcalfe & Coworkers 1955).

Indirect method has also been used for measurment of placental perfusion. Brosens and associates (1972), reported that the mean diameter of myometrial spiral arterioles of normal pregnant women was 500 um amd in preeclampsia was 200 um.

II. KIDNEY :

The main renal changes in pre-eclampsi occur in the glomeruli Sheehan and Lynch, (1973), described 10 characteristic changes which include in order of frequency: enlargement of the glomeruli, thickening of the tuft epithelium, vacuoles in tuft epithelium, moderate or gross ballooning of loops, swelling of endothelial / mesangial cells, fat in glomerular cells, pouting of glomeruli, hyaline and fat deposition in glomeruli, foam cells in glomeruli, thrombi, and