# بسم الله الرحمن الرحيم


HOSSAM MAGHRABY

شبكة المعلومات الجامعية


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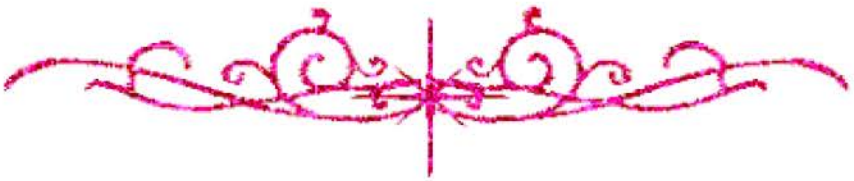
# التوثيق الالكتروني والميكروفيلم



HOSSAM MAGHRABY

شبكة المعلومات الجامعية

# جامعة عين شمس

## التوثيق الإلكتروني والميكروفيلم

## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

## يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

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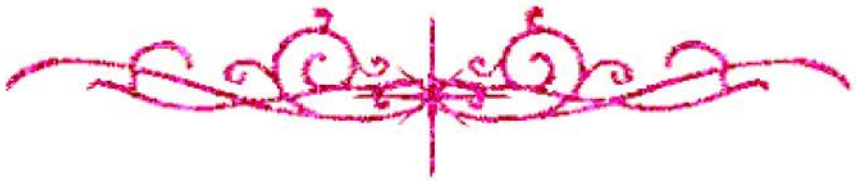
# بعض الوثائق الأصلية تالفة



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شبكة المعلومات الجامعية


# بالرسالة صفحات

# لم ترد بالأصل

HOSSAM MAGHRABY

# USE OF DOPPLER INDICES FOR MONITORING THE EFFECT OF DIFFERENT ANTIHYPERTENSIVE DRUGS ON FETAL WELL-BEING IN PREGNANCY INDUCED HYPERTENSION

THESIS

**SUBMITTED TO THE FACULTY OF MEDICINE,
ALEXANDRIA UNIVERSITY**

**In Partial Fulfillment of the requirements
Of the degree of
Doctor of Obstetrics and Gynecology**

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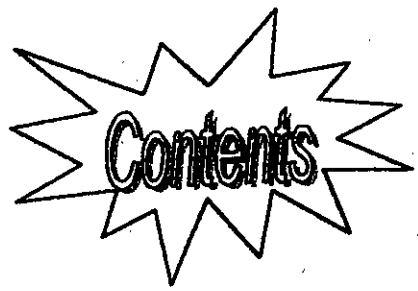

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# Introduction

Hypertensive disorders in pregnancy are common and form one of the deadly triad, along with hemorrhage and infection, that result in a large number of maternal deaths.[1]

Pregnancy can induce hypertension in normotensive women or aggravate already existing hypertension. Generalized edema, proteinuria or both may also accompany pregnancy-induced or aggravated hypertension. If hypertension is untreated, convulsions may develop[1].

But how pregnancy incites or aggravates hypertension remains unsolved despite decades of intensive researches. However many controversies concerning the etiology, pathophysiology, and treatment of hypertension in pregnancy dominate this important area of reproductive medicine.[2]

**Classification:-**

The literature dealing with high blood pressure in pregnancy is confusing and controversial. The failure to achieve a universally acceptable classification results from a lack of knowledge of the precise nature and cause of the disorders, the absence of clinical or pathologic features or tests by which they can be clearly separated.[3]

Davey and Mac Gillivary (1988)[4] have proposed a classification based solely on the physical signs of hypertension and proteinurea. Table I[4]

**TableI. Clinical classification of hypertensive disorders of pregnancy**[4]

**I) Gestational hypertension and / or proteinurea**

Hypertension and / or proteinurea developing during pregnancy, labor, or the puerperium in a previously normotensive, non- proteinuric woman subdivided into:

1. Gestational hypertension (without proteinuria)
2. Gestational proteinuria (without hypertension)
3. Gestational proteinuric hypertension (pre-eclampsia).

**II) Chronic hypertension and chronic renal disease**

Hypertension and / or proteinuria in pregnancy in a woman with chronic hypertension or chronic renal disease diagnosed before, during or after pregnancy subdivided into:

1. Chronic hypertension (without proteinuria)
2. Chronic renal disease (proteinuria with or without hypertension)
3. Chronic hypertension with superimposed pre-eclampsia. Proteinuria developing for the first time during pregnancy in a woman with known chronic hypertension.

**III) Unclassified hypertension and / or proteinuria**

Hypertension or proteinuria found either:

1. At first examination after twentieth week of pregnancy in a women without a known chronic hypertension or chronic renal disease.
2. During pregnancy, labor, or the puerperium where information is insufficient to permit classification this will be regarded as unclassified hypertension during pregnancy

**IV) Eclampsia:**

The occurrence of generalized convulsions during pregnancy, during labor, or within 7 days of delivery and not caused by epilepsy or other convulsive disorders.

Because of the confusion that has resulted from the previous classification, most of authors use the classification of the American College of Obstetricians and Gynecologists (1986) which is simple, convenient, and easy to follow. Table II[1]

***Table II. Classification of hypertensive disorders complicating pregnancy[1].***

| |
|---|
| ***Pregnancy –induced hypertension***: hypertension that develops as a consequence of pregnancy, and regresses postpartum.<br>1)Hypertension without proteinuria or pathological edema.<br>2)Pre-eclampsia with proteinuria and /or pathological edema :<br>a-Mild<br>b-Severe<br>3)Eclampsia:proteinuria and/or pathological edema along with convulsions.<br><br>***Pregnancy-aggravated hypertension***: underlying hypertension worsened by pregnancy.<br>1)Superimposed preeclampsia.<br>2)Superimposed eclampsia.<br><br>***Coincidental hypertension***: chronic underlying hypertension that antecedes pregnancy or persists postpartum. |

**I) Pregnancy induced hypertension:-**

It is divided into three categories which are:

1. Hypertension alone (without proteinuria or pathological edema).
2. Pre-eclampsia
3. Eclampsia

The classical diagnosis of pre-eclampsia is based on the triad of hypertension- edema and proteinuria.

**A)Hypertension:**

- Chesly(1985)[5] said that hypertension is the Sine qua non of pre-eclampsia
- Hypertension is a measurable sign of pre-eclampsia which is diagnosed when there is a rise in systolic blood pressure of at least 30mm Hg or a rise in diastolic pressure of at least 15 mm Hg over the base line values on at least two occasions 6 or more hours apart.[1] Ideally the base line blood pressure should be established early in the first trimester. Or when blood pressure is 140/90 mm Hg or more which represent a Mean Arterial pressure (MAP) of 107 mm Hg or more.

$$MAP = \text{Diastolic pressure} + \left[\frac{\text{systolic pressure} - \text{Diastolic pressure}}{3}\right]$$

**B)Edema:**

Edema is a common symptom of pregnancy. It results from general and excessive accumulation of fluid in the tissues, generally demonstrated by the swelling of the extremities and face.[6]

Edema of the face and hands may be a better indicator of pre-eclampsia because it is associated with sodium retention rather than dependent edema which is caused by hydrostatic mechanisms.[7]

The fluid may be intracellular or extracellular, and edema usually is not demonstrated until there is a weight gain of 10 percent from the pre-pregnancy weight.

Edema is usually physiologic, but when it occurs in association with hypertension and proteinuria, the perinatal mortality rate is increased. When vasoconstriction occurs, it can cause a decrease of oxygen and glucose to the body tissues. When this occurs, shift of fliud especially blood plasma, from the circulation to the body tissues. As the intravascular volume shifts, edema can be seen and there is a rise in hemoconcentration demonstrated by an increased hematocrit.[6,8]

Approximately 85 percent of patients who develop generalized edema have normal pregnancies, only about 15 percent develop pre-eclampsia. Edema is, thus, a very rough clinical parameter and can reflect changes that are non pathologic.[9]

**C) Proteinuria:**

It is an important sign of pre-eclampsia and Chesley (1985)[5] rightfully concluded that the diagnosis is questionable in its absence. Protenuria is the presence of urinary protein in concentration greater than 300mg/lit in a 24 hours urine collection or in concentration greater than 1+ or 2+ by standard turbidimetric methods (dipstick) on two or more occasions at least 6 hours apart. The urine must be a clean voided, midstream specimen or one obtained by catheterization.[1,6]

A combination of 2+ proteinuria (1g/lit) and hypertension at least doubles the perinatal mortality rate. Edema with proteinuria also increases perinatal risks.[10,11,12]

Mc Cartney and co-workers (1971)[13], in their extensive study of renal biopsy specimens obtained from hypertensive pregnant women, invariably found that proteinuria was present when the glomerular lesion considered to be characteristic of pre-eclampsia.[13]

**Severity of pregnancy induced hypertension:**

The severity of pregnancy - induced hypertension is assessed by the frequency and intensity of the abnormalities listed in table III.[1]

**Table III Abnormalities in mild and severe cases of Pregnancy induced hypertension.[1]**

| Abnormality | Mild | Severe |
|---|---|---|
| Diastolic blood pressure | <100 mg Hg | 110 mm Hg or higher |
| Proteinuria | trace to 1+ | persistance 2+ or more |
| Headache | absent | present |
| Visual disturbances | absent | present |
| Upper abdominal pain | absent | present |
| Oliguria | absent | present |
| Convulsions | absent | present (eclampsia) |
| Serum creatinine | normal | elevated |
| Thrombocytopenia | absent | present |
| Hyperbilirubinemia | absent | present |
| Liver enzyme elevation | minimal | marked |
| Fetal growth retardation | absent | obvious |
| Pulmonary edema | absent | present |

**II) Pregnancy- aggravated hypertension:**

Preexisting chronic hyertension worsens in some women, typically after 24 weeks gestation. Such pregnancy aggravated hypertension may be accompanied by proteinuria or pathological edema, the condition is then termed superimposed preeclampsia. Often, the onset of superimposed preeclampsia occurs earlier in pregnancy than pure preeclampsia, and it tends to be severe and accompanied, in many cases, by fetal growth retardation, the perinatal morbidity and mortality as well as the incidence of maternal complications are significantly increased.[1,14]

**III) Coincidental hypertension (chronic hypertension)**

All chronic hypertensive disorders can create a difficult problem of diagnosis and management in women who are not seen until after mid pregnancy. The diagnosis of coincidental or chronic hypertension is suggested by the following:-

1. Hypertension (140/90 mm Hg or more) antecedent to pregnancy.
2. Hypertension (140/90 mm Hg or more) detected before the $20^{th}$ week of pregnancy (unless there is gestational trophoblastic disease).
3. Persistent hypertension long after delivery.

There are many causes of hypertension that may be encountered during pregnancy which are listed in table IV.[1]