Feto-maternal outcome of preeclampsia in multigravida compared to primigravida women

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ABSTRACT

Background: **Pregnancy induced hypertension including pre-eclampsia are global public health concern both in developed & developing countries. They have significant prenatal, neonatal & maternal morbidity & mortality.**

Objectives: **The aim of this prospective comparative study is to identify & compare the maternal & neonatal outcome of pre-eclampsia in between multigravida & primigravida.**

Patients: **This study had been done over period of one year (1st Sep.2017-31st Aug. 2018) in Basrah Maternity & Child Hospital in which (110) multigravida with pre-eclampsia were compared to (108) primigravida with pre-eclampsia. Both groups were admitted to labor room during same period of study with spontaneous labor or for induction of labor.**

Results: **Multigravida with pre-eclampsia were found to have significantly more advanced age more than thirty years (58%) as well as higher body mass index with morbidly obese (75%). They also exhibited more severe form of pre-eclampsia (75%) as well as recurrent pre-eclampsia (45%), with positive family history of pre-eclampsia (64%) & chronic hypertension (27%). Obstetrical complications in term of ante-partum hemorrhage (29%), post-partum hemorrhage (43%) & preterm delivery (50%) were evident more in multgravida with pre-eclampsia as well as poor neonatal outcome in term of low birth weight, & low Apgar score.**

Conclusion: **Multigravida with pre-eclampsia had significantly higher rates of severe type with adverse maternal& neonatal outcome in comparison to primigravida with pre-eclampsia.**

Keywords: **Feto-maternal outcome of preeclampsia in multigravida compared to primigravida women**

ارتفاع ضغط الدم الأرتعاجي ومقارنة نتائج الحمل للولادات المتعددة مع ذوي الولادات الاولية.

المقدمة: **يعد ارتفاع ضغط الدم الارتعاجي من المشاكل الصحية المنتشرة في كل من الدول المتقدمة والنامية. اذ تسبب مضاعفات اثناء الحمل في كل من الجنين والام.**

الاهداف: **الهدف من هذه الدراسة هو المقارنة للمضاعفات التي تصيب كل من الام والجنين نتيجة لارتفاع ضغط الدم الارتعاجي بين الحوامل ذوي الولادات المتكررة واولية الحمل.**

طريقة العمل: **لقد اجريت الدراسة في مستشفى البصرة للنسائية والطفل في الفترة الزمنية من(أيلول/ ٢٠١٧) حتى نهاية(آب/٢٠١٨)٠ ولقد شملت هذه الدراسة ١١٠ حامل ذات ولادات متكررة و ١٠٨ اولية الحمل ادخلوا الى صالة الولادة في نفس الفترة الزمنية مصابات بارتفاع ضغط الدم الارتعاجي ولديهن ولادة او لعمل الولادة الاصطناعية.**

النتائج: **ولقد تبين ان تقدم العمر ٥٨% والسمنة ٨٣.٥% وارتفاع ضغط الدم الارتعاجي من النوع الشديد ٧٥.٤ %كان من سمات الحوامل ذوي الولادات المتكررة وكذلك وجود التاريخ العائلي لارتفاع ضغط الدم الارتعاجي ٦٣.٦% وارتفاع ضغط الدم المزمن ٢٧% كعوامل مساعدة كان بينهم بنسبة اكبر. كانت المضاعفات التي تصيب الام مثل نزف ما قبل الولادة (انفصال المشيمة) ٢٩%، نزف ما بعد الولادة ٤٢.٧% ،تكرار ضغط الدم الارتعاجي ٤٤.٥% والمضاعفات التي تصيب الجنين مثل ضعف نمو الجنين داخل الرحم وولادة الاجنة بأوزان قليلة ٥٤.٥% مما استدعى ادخالهم بنسبة اكثر الى وحدة الخدج ٤٠.٩% كان كبيرا بين الحوامل ذوي الولادات المتكررة. اما الحوامل ذوي الولادات الاولية كانت نسبة الصرع الارتجاجي ٢٤% مع الولادات القيصرية ٤٤% اكثر مقارنة بالحوامل ذوي الولادات المتكررة،**

الاستنتاج: **تبين ان الحوامل ذوي الولادات المتكررة هم اكثر عرضة لمخاطر ارتفاع ضغط الدم الارتعاجي كما انه يكون من النوع الشديد اكثر مقارنة باللواتي اولية الحمل.**

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INTRODUCTION

The international society for the study of hypertension in pregnancy (ISSHP) currently defines preeclampsia as **[**Occurrence of hypertension in combination with proteinuria developing after 20 weeks in previously normotensive patient]**[1]** Hypertensive disorders complicate about (7-10%) of all pregnancies; pregnancy induced hypertension (PIH) including pre-eclampsia is responsible for (70%) of hypertensive disorders in pregnancy whereas chronic hypertension represent (30%).[2] Preeclampsia complicate first pregnancy in (3-5%) & (1%) in subsequent pregnancies. [3] Risk factors that predispose to pre-eclampsia include; first pregnancy, new paternity, multiple pregnancy, polyhydramnious, hydatiform mole, malnutrition, obesity, previous history of PE, family history of pregnancy induced hypertension & underlying vascular or chronic disease as chronic hypertension, diabetes, renal disease, thrombophilias & lupus.[4]

According to the severity: it is subdivided into:-

1. ***Mild PE:*** It is characterized by hypertension with systolic Bp (≥ 140 mm Hg**)** or rises at least (30mmHg) over baseline value or diastolic Bp (≥ 90mmHg) or rises at least (15mmHg) over baseline value, proteinuria (>300mg / 24 h), mild edema signaled by weight gain (>2 lb / week or > 6 lb / month) and urine output (> 500 ml / 24 hours).[5]
2. ***Severe PE:*** It is characterized by Bp (≥ 160 / 110 mmHg) on two occasions at least 6 hours apart with patient on bed rest or a systolic Bp rise of (>1 60 mmHg) over baseline or diastolic Bp rise of (> 130mmHg) over baseline, with proteinuria > 5g /24 h or 3+ or 4+ on urine dipstick, massive edema, oliguria less than 400ml/24h, headache, visual changes, right upper quadrant abdominal pain with elevated liver enzymes or thrombocytopenia.[5] Maternal complications acutely include: Eclamptic seizures, pulmonary edema, thrombotic complications (DIC), acute renal failure, placenta abruption, cerebral hemorrhage, HELLP Syndrome, cortical blindness & retinal detachment, while fetal complications include growth restriction, still birth & prematurity. [6]

PATIENTS & METHODS

A prospective comparative study had been conducted in Basrah Maternity & Child Hospital over one year from (1st Sep.2017-31st Aug. 2018). It included (218) pregnant women who had been admitted to labor room either with spontaneous labor or for induction of labor and diagnosed to be a known case of PE or diagnosed on admission. They had been subdivided into (108) as primigravida & (110) as multigravida. Their gestational age range between (28-40 weeks). The diagnosis had been confirmed by detailed history & physical examination including measurement of blood pressure & detection of edema as well as urine analysis for albumin. Those with chronic hypertension superimposed by PE had been included in such study. Both groups were interviewed using special printed questionnaire paper prepared for this purpose including **(**maternal age, gestational age, past obstetrical history including PE in previous pregnancies, medical history including chronic hypertension, D.M., chronic renal problems & family history of PE**).** Data about maternal obstetrical complications, mode of delivery & neonatal outcome had been documented in these questionnaire forms.

Maternal body weight & height was measured to identify BMI which is measured by:- Weight in kilograms / height in meters.[2]

It is classified into:

1. Acceptable: If it is 19 – 25.
2. Over weight: If it is 25 – 30.
3. Obese: If it is 30 – 40.
4. Morbidly obese: If it is > 40. [7]

Evaluation of Apgar score including (heart rate, respiratory effort, muscle tone, facial grimace & color) within (5minutes) had been done by pediatrician. A score of (0-3) require resuscitation, intubation & admission. A score of (4-7) indicate the use of some measures of resuscitation & newborn will be in favorable condition. [8] P-value was estimated to assess the significance of difference using Z-test.

RESULTS

Maternal demographic features of both groups were shown in (Table-1); Pre-eclampsia tend to occur more as the age advanced so more than half of multigravida (58%) whose age is (> 30 years) had been developed PE compared to (15%) of primigravida with statistically highly significant difference (P < 0.01).

Table 1. Maternal demographic characters.

Features	Primigravida No. (%)	Multigravida No. (%)
1. Maternal age		
< 18 years	**18 (15.7)**	**3 (2.7)**
19-30 years	**75** (69.4)**	**43 (39)**
> 30 years	**16(14.8)**	**64** (58.2)**
Total	***108***	***110***
2. B.M.I.		
a. Acceptable	**3 (3.7)**	**8 (7.2)**
b. Over weight	**15 (13.8)**	**10 (9.0)**
c. Obese	**36** (33.3)**	**10 (9.0)**
d. Morbidly obese	**53 (49.1)**	**82* (74.5)**
Total	***108***	***110***

***: P< 0.05** ****: P< 0.01**

Obesity is evident among both groups but multigravida tend to have greater BMI where about (75%) were classified as morbidly obese compared to (49%) of primigravida with statistically significant difference (P < 0.05). Both groups had been classified according to the severity of PE into mild & severe as shown in (Table-2). About three fourths of multigravida (75%) had severe PE compared to (55%) of primigravida with statistically significant difference (P < 0.05).

Table 2. Classification according to severity of PE.

Type	Primigravida No. (%)	Multgravida No. (%)
Mild PE	**49* (45.3)**	**27 (24.5)**
Sever PE	**59 (54.6)**	**83* (75.4)**
Total	**108**	**110**

(Table-3) represent the risk factors that predispose to pre-eclampsia; previous history of PE in multigravida increase the risk of recurrence (45%**).** Family history of PE existed in (64%) of multigravida compared to (48%) of primigravida with statistically highly significant difference (P < 0.01**).**

Table 3. Risk factor for PE

Risk factor	Primigravida No. (%)	Multigravida No. (%)
1. Obesity	**89(82.4)**	**92 (83.6)**
2. Advanced maternal age	**16(14.8)**	**64** (58.2)**
3. previous history of PE	**0 (0)**	**49** (44.5)**
4. Family history of PE	**52 (48.1)**	**70** (63.6)**
5. Chronic disease:		
a.chronic hypertension	**8 (7.4)**	**30*(27.2)**
b.D.M.	**3 (3.7)**	**23*(20.9)**
c. chronic renal disease	**2 (1.8)**	**8 (7.2)**
6. Multiple pregnancy	**3 (2.7)**	**6 (5.4)**

Chronic diseases as chronic H.T. & D.M. were more evident among multigravida in whom (27%) had chronic H.T. & (21%) had D.M. compared to (7% & 3%) respectively in primigravida with statistically significant difference (P<0.05).Obstetrical complications of PE were listed in (Table-4); where (20%) of primigravida had developed eclamptic fits compared to (7%) in multigravida with statistically significant difference (P < 0.05). Ante-partum hemorrhage in form of abruption placentae complicate pregnancy in (29%) of multigravida compared to (7%) of primigravida with statistically significant difference (P < 0.05**).** Post-partum hemorrhage complicate (43%) of multigravida compared to (13%) of primigravida with statistically highly significant difference (P < 0.01).

Table 4. Obstetrical complications.

Complications	Primigravida No. (%)	Multigravida No. (%)
1. Eclamptic fit.	22* (20.3)	8 (7.2)
2. Abruption placenta	8 (7.4)	32 (29.0)
3. Post-partum hemorrhage	14 (12.9)	47** (42.7)
4. D.I.C	1 (0.9)	0 (0)
5. Pulmonary edema	0 (0)	1 (0.9)
6. HELLPS syndrome	0 (0)	3 (2.7)
7. Maternal death	0 (0)	1 (0.9)

Labor outcome was shown in (Table-5) where about (50%) of multigravida with PE had preterm labor compared to (31%) of primigravida with statistically significant difference ($P < 0.05$), among those spontaneous preterm labor was more in multigravida (41%) compared to (4%) in primigravida with statistically highly significant ($P < 0.01$), Vaginal deliveries were the end result in (73%) of multigravida with PE compared to (56%) of primigravida while C/S was more frequent among primigravida (44%) compared to (26%) of multigravida with statistically significant difference ($P < 0.05$).

Table 5. Labor outcome

Events	Nulliparous No. (%)	Multiparous No. (%)
1. Preterm labor:	34 (31.4)	55* (50)
a. Spontaneous	4 (3.7)	42** (38.1)
b. Iatrogenic	30*(27.7)	10 (9.08)
2. Induction of labor	40* (37.0)	21 (19.0)
3. Mode of delivery		
a. N.V.D	60 (55.6)	80*(72.7)
b. C/ S	48* (44.4)	29 (26.3)
c. *Instrumental*	0 (0)	1 (0.9)

(Table-6) represent the main indication for C/S in both groups. There was no significant difference among all indications mentioned apart from immanent eclampsia which was significantly more in primigravida (24%) compared to (6%) in multigravida with statistically significant ($P < 0.05$).

Table 6. Indications for C/S.

Indication for c/s	Nulliparous N0. (%)	Multiparous No. (%)
1. Immanent eclampsia	26* (24.27)	7 (6.36)
2. Abruption placenta	5 (4.62)	12(10.9)
3. Eclamptic fit	9 (8.3)	2(1.8)
4. Prolong labor	8 (7.4)	3 (2.7)
5. Repeated scar	0 (0)	5 (4.5)

Neonatal outcome was shown in (Table-7) where about (55%) of newborns of multigravida with PE had B.W. < 2500g compared to (36%) of those born to primigravida with statistically highly significant difference ($P < 0.01$).

In multigravida; (32%) of newborns delivered had apgar score (< 3) while about (54%) had apgar scor between (4-7) with statistically significant difference ($P<0.05$) so that admission to N.I.C.U tend to be more in newborns of multigravida (41%)compared to those of primigravida (19%) with statistically significant difference.

Table 7. Neonatal outcome

Outcome	Primigravida No. (%)	Multigravida No. (%)
1. Birth weight:		
a. < 2500 gm	39 36.1	60** 54.5
b. >2500-4000 gm	86** 79.6	56 50.9
c. > 4000 gm	3 2.7	10 9.0
2. Still birth:	22 20.3	9 8.1
a. Fresh	18 16.6	3 2.7
b. Macerated	4 3.7	6 5.4
3. Apgar score:		
a. <3	13 12.0	35* 31.8
b. 4-7	58* 53.7	37 33.6
c. >7	37 34.2	38 34.5
4.Neonatal intensive care unit admission.	21 19.4	45* 40.9

DISCUSSION

Pre-eclampsia is estimated to affect (8 370 000) women worldwide every year; several studies investigated the risk of such disease which was regarded classically as a disease of first pregnancy so that primgravidity is the risk factor for the development of pre-eclampsia**,** but the multigravida women are also liable for the development of pre-eclampsia although the risk factors are less well defined**.** [9] In this research; about (70%) of primigravida with PE had age range between (19-30years), this disagreed the concept that very young age (i.e. < 18 years) is one of the risk factors and in agreement with that advanced maternal age is also one of risk factors for the development of PE.[10] This last concept is also truly applied to multigravida with PE since about more than half (58%) had age (> 30 years). Among maternal demographic features; obesity with high BMI was evident among both primi &multigravida; this is in agreement with the concept that obesity is one of the major risk factors for the development of PE.[11] Maternal & prenatal outcome are determined by the severity of the disease. In general; maternal & prenatal outcome are usually favorable in those with mild PE especially if developed beyond (34weeks).[11] About three quarters of multigravida with PE had severe type in this study since they were of advanced maternal age so more liable for the development of chronic hypertension which if complicated by superimposed PE, it tend to occur in more severe form**.**[12] This is confirmed as shown in (Table-3) where about (27%) of multigravida had chronic H.T. superimposed by PE in this pregnancy compared to only (7%) in primigravida. Other risk factor that predispose to PE in addition to obesity & advanced maternal age is the previous history of PE which was recur in about(45%) of multigravda & this goes with the finding that the overall recurrence rate had been reported to be (40%) which was (3-6times) greater than the rate reported for primigravida.[13] Positive family history of PE as well as preexisting chronic medical diseases as H.T. & D.M. found more in multigravida with PE; this confirm the concept that genetic predisposition including daughters of preeclamptic mothers & first degree relatives are at highest risk of developing PE as well as the existing of chronic medical disorders increase the chance of developing PE**.**[14] Pregnancy of multigrvida tend to be complicated by abruption placenta in higher rates compared to primigravida with PE (29% Vs 7%**)** as well as postpartum hemorrhage (43% Vs 13%); this was in agreement with the result obtained in previous study (6.7% Vs 1.5%) for the abruption placentae and (39% Vs 19%) for the postpartum hemorrhage,[15] While eclamptic fits were significantly more likely complicate pregnancy of primigravida as the level of B.P. that can tolerated by brain tissues was lower than those with chronic H.T.which was more evident in multigravida. In our study multigravida with PE had spontaneous preterm labor more than primigravida; this agreed the concept that parous women especially with recurrent PE experienced more preterm deliveries between (35-<37weeks).[16] Iatrogenic preterm deliveries was needed more in primigravida with PE in this study as active intervention to prevent eclamptic fit & other maternal complications particularly among those with sever PE & those who had been exceeded (34weeks) gestation. C\S was the end result in about (44%) of primigravida with PE compared to only (26%) in multigravida with PE; this agreed the result previously obtained in other study (70% Vs 44%).[16] This high rate of C\S was explained by increase the demand for the termination of pregnancies to prevent the risk of eclamptic fit & other maternal complications which will develop more among those with severe PE, that is why induction of labor & C\S were needed more among primigravida with PE in whom the main indication of C\S was severe pre-eclampsia (i.e.

immanent eclampsia). Prenatal outcome is strongly influenced by gestational age & the severity of hypertension. The main impact on the fetus is under nutrition as result of utero - placental vascular insufficiency which lead to growth restriction.[17] In this study; multigravida with pre-eclampsia had newborns with low birth weight. significantly more compared to primigravida (55% Vs 36%). Such low birth weight (i.e. < 2500gms) was attributed to both high frequency of preterm labor as well as intrauterine growth restriction**.** Consequence to the above; newborns with low apgar score (< 3) tend to be more among multigravida with PE (32% Vs 12%) & as result the need for admission to the neonatal intensive care unit was more among newborns of multigravida.

Recommendation:. As pre-eclampsia remains a major cause of maternal, fetal & neonatal morbidity & mortality contributing to a significant health care economic burden as well as it is also predispose the mother & child to long-term health complications as cardiovascular disease so that there should be improvement in the health care services supplied by primary health care centers to diagnose PE as early as possible as well as measures to prevent development of PE should be established.

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