RISK FACTORS AND LABOUR OUTCOME IN PAROUS WOMEN WITH PRE - ECLAMPSIA

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ABSTRACT

This is a case-control study, carried out to estimate the frequency of parous women with pre-eclampsia among all deliveries conducted in the study period (September 2004 -September 2005); to identify demographic, medical and obstetrical risk factors that are associated with recurrence of pre-eclampsia in subsequent pregnancies as well as to assess perinatal outcome. The study included 165 parous women with pre-eclampsia as (cases) compared to 200 normotensive parous women as (controls). The study found that the incidence of parous women with pre-eclampsia was about 1% of all deliveries. Recurrence rate was about 55%. Advanced maternal age, body overweight and obesity, chronic hypertension, previous pre-eclampsia, long interval between pregnancies, previous preterm labor, poor antenatal care and family history of pre-eclampsia were the main risk factors associated with development of pre-eclampsia. Higher rate of cesarean section for eclampsia, fetal distress and abruption placenta was found among parous women with pre-eclampsia as well as high rate of abruption placenta and postpartum haemorrhage as obstetrical complications. Adverse perinatal outcome was reported in women with pre-eclampsia in term of high rate of preterm delivery, fetal death, low birth weight and low apgar scor. In conclusion; the overall recurrence of pre-eclampsia in subsequent pregnancies is still high with poor prognosis regarding maternal and perinatal morbidity and mortality.

INTRODUCTION

The international society for the study of hypertension in pregnancy (ISSHP) currently defines pre-eclampsia as (Occurrence of hypertension in combination with proteinurea developing after 20 weeks in previously normotensive patient)[1]. Hypertensive disorders in pregnancy complicate about 7-10% of all pregnancies; pregnancy induced hypertension (PIH) which includes pre-eclampsia (PE) is responsible for (70%) whereas chronic hypertension represents (30%) of hypertensive disorders[2]. Pre-eclampsia complicate first pregnancy in 3-5% and 1% in subsequent pregnancies[3]. The aetiology of pre-eclampsia is unknown; it was thought to be multifactorial. Placenta itself is central to the pathogenesis of pre-eclampsia so incidence correlates with placental mass being increase in twin and molar pregnancy[4]. Pre-eclampsia is a syndrome which can be recognized by group of symptoms and signs but not diagnosed because there is no specific diagnostic test. Other features rather than hypertension and proteinurea may aid recognition as well as reflect severity[3]:

a. Maternal syndrome: includes generalized oedema, hyperuricemia, increased packed cell volume, decreased platelets count, abnormal liver function, decreased antithrombin III, hypocalcaemia, increased fibronectin, increased Von-Willbrand's factor and abnormal uterine artery Doppler waveform.

b. Fetal syndrome: growth restriction, abnormal fetal vessels Doppler waveform and fetal hypoxaemia. Pre-eclampsia accounts for 16% of maternal death; the mortality is much higher in developing countries. Cerebral haemorrhage is the principle cause of death. Perinatal mortality is around 35/1000 of total birth and may reach 160/1000 in severe cases. Gestational age at delivery is the main factor determining outcome; survival being <40% when delivery is <28 weeks[3].

SUBJECTS & METHODS

A retrospective case-control study of pre-eclampsia in the gravid parous women has been performed in Basrah Maternity & Child Hospital from September-2004 to September-2005. The study involved 165 gravid parous women with pre-eclampsia admitted to labor room during the study period (cases) compared with 200 gravid parous women as control group. Such group was selected on the basis of having normal blood pressure measurement on admission with no history of hypertension in the present pregnancy obtained by history and antenatal card if present. They were multigravida admitted in active labor during the same study period.

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Both cases and controls were interviewed by the researcher by using special questionnaire form prepared for the purpose of the study which includes: maternal age, parity, body weight and height from which body mass index (BMI) had been measured, past obstetrical history including pre-eclampsia in previous pregnancies, previous preterm delivery, birth interval from last pregnancy with pre-eclampsia, medical history of chronic hypertension, diabetes and renal disease, adequacy of antenatal care, family history of pre-eclampsia, mode of delivery, gestational age, obstetrical complications, alive or dead newborn, birth weight and apgar scor.

The severity of pre-eclampsia had been graded into:-

1. Severe: If diastolic level of blood pressure is >110mmHg with persistent albuminuria (2+), in addition to headache, visual disturbance, oliguria and upper abdominal pain.
2. Mild: If diastolic level of blood pressure is < 100mmHg with albuminuria (trace or 1+) with absence of above symptoms[5].

Index of antenatal care utilization (R-GINDEX) used to measure adequacy of antenatal care. This index assess adequacy on basis of:

a. Trimester the antenatal care begins.
b. Number of visits.

It was regarded adequate if antenatal care began in the first trimester and total visits approximate 4-5[6]. BMI has been estimated by (weight in kilogram/height in meter^2), it is regarded as acceptable if equal to 19-25, over weight if equal to 25-30, obese if it is 30-40 & morbidly obese if it is >40[7]. Evaluation of apgar scor including heart rate, respiratory effort, muscle tone, facial grimace and color was done within 60 seconds after birth. A scor of 10 indicates best possible condition of newborn, a scor of 0-3 requires immediate resuscitation including intubations and admission. A scor of 4-7 indicates the use of some measures of resuscitation and newborn will be in favorable condition[8].

The X^2 test was used to test the level of association.

RESULTS

Out of 16937 women delivered at the hospital during the study period; 169(1%) had pre-eclampsia. Nearly 55% of them had severe pre-eclampsia.

Maternal demographic features of both cases and controls are shown in *(Table-1)*. Nearly one third (31.5%) of cases were between 18-25y, more than one quarter (27.3%) were >35y compared to 36% & 10% of controls with a statistically significant difference (P<0.05 & <0.01) respectively. Regarding parity; the distribution of cases and controls were comparable with no statistically significant difference (P>0.05). The cases tend to have heavier weight than controls with statistically significant difference (P<0.01).

Table 1. ***Maternal demographic features.***

Character	Case		Control	
	No.	*%*	*No.*	*%*
Maternal age (year)				
18 - 25	52*	31.5	72	36.0
26 - 35	68**	41.2	108	54.0
> 35	45**	27.3	20	10.0
Total	165	100.0	200	100.0
Maternal parity				
1	59	35.7	67	33.5
2-4	66	40.0	80	40.0
>5	40	24.3	53	26.5
Total	165	100.0	200	100.0
BMI				
Acceptable	52**	31.5	102	51.0
Overweight	74	44.9	86	43.0
Obese	22**	13.3	8	4.0
Morbidly obese	17**	10.3	4	2.0
Total	165	100.0	200	100.0

*: P < 0.05
**: P < 0.01
BMI: body mass index

(Table-2) shows the distribution of cases and controls according to the presence of medical and obstetrical risk factors. It is evident that 7.3% of cases had chronic hypertension, 4.8% had diabetes and 2.4% had renal disease compared to none, 1% and 0.5% among controls. Nearly 55% of cases had history of previous pre-eclampsia compared to only 5% of controls, the difference was statistically highly significant (P<0.01). Also it is evident that 12.2% had long birth interval (≥5y), nearly 11% had previous preterm labor, 43.6% had inadequate antenatal care and nearly 56% had family history of pre-eclampsia compared to none, 1.5%, 20% & 11% among controls with

highly statistically significant difference (P<0.01).

Table 2. ***Distribution of studied groups according to presence of medical & obstetrical factors.***

Factor	Case		Control	
	No.	*(%)*	*No.*	*(%)*
A. Medical				
1.Chronic hypertension	12**	7.3	0	0.0
2. D.M.	8	4.8	2	1.0
3.Renal disease	4	2.4	1	0.5
B. Obstetric				
1.Previous PE	90**	54.5	10	5.0
2.Birth interval from previous PE (year)				
1 - 2	38**	23.0	6	3.0
3 - 4	32**	19.3	4	2.0
≥ 5	20**	12.2	0	0.0
3. Previous preterm labour	18**	10.9	3	1.5
4. Inadequate A.N.C.	72**	43.6	40	20.0
5.Family history of PE	92**	55.7	22	11.0

Regarding mode of delivery in (Table-3); 27.8% of cases delivered by cesarean section compared to only 6.5% of controls with a highly statistically significant difference (P<0.01). The table also shows that 15.1% of cases had preterm labor compared to 2.5% of controls with a highly statistically significant difference (P<0.01), nearly 10% of cases had eclamptic fit compared to none among controls with a highly statistically significant difference (P<0.01). Also (Table-3) shows that 6% of cases had accidental haemorrhage, 2.4% had placenta previa and 4.8% had postpartum haemorrhage compared to only 1.5%, 1%, & 1% for controls respectively with highly statistically significant difference (P<0.01).

Table 3. ***Distribution of the studied group according to labor outcome.***

Events	Case		Control	
	No.	*(%)*	*No.*	*(%)*
1. Mode of delivery				
a. N.V.D.	119**	72.1	183	91.0
b. C.S.	46**	27.8	13	6.5
c. *Instrumental*	0*	0.0	5	2.5
2. Gestational age				
a. Term (≥37 weeks complete)	140**	84.8	195	97.5
b. Preterm (≤37 weeks not complete)	25**	15.1	5	2.5
3. Obstetrical complications				
a. Eclamptic fit	16**	9.6	0	0.0
b. A.P.H.				
1. Accidental H.	10**	6.0	3	1.5
2. Placenta previa	4	2.4	2	1.0
c. P.P.H.	8**	4.8	2	1.0

N.V.D.: Normal vaginal delivery, C.S.: Cesarean section

Indications for cesarean sections were listed in (Table-4); eclampsia was the main indication among cases (9.6%) followed by fetal distress (6.0%) compared to none & 1.5% among the controls with highly statistically significant difference (P<0.01).

Table 4. ***Distribution of the studied groups according to the indications of C.S.***

Indications	Case		Control	
	No.	*(%)*	*No.*	*(%)*
1. Eclampsia	16*	9.6	0	0.0
2. Fetal distress	10*	6.0	3	1.5
3. Antepartum hemorrhage				
a. Accidental	4*	2.4	0	0.0
b. Placenta previa	4	2.4	3	1.5
4. Malpresentation	6*	3.6	3	1.5
5. Prolong labor	6	3.6	4	2.0
Total	46	27.6	13	6.5

(Table-5) shows the distribution of the studied group according to the status of the newborn. It is shown that 18 (10.9%) of newborns born to parous women with pre-eclampsia born dead, 12(7.2%) with birth weight <2000gm and (3.0%) with birth weight >4000gms compared to 2%, 1%, & 6% among controls respectively and the difference was statistically significant (P<0.01). It is evident that 10 babies (6%) born to parous women with pre-eclampsia had apgar score ≤3 compared to 1% among controls and the difference was statistically significant (P<0.01) with 14 babies (8.4%) needed admission to intensive care unit compared to only 1% among babies born to control group so the difference was statistically significant (P<0.01).

Table 5. ***Distribution of the studied group according to the neonatal status.***

Events	Case		Control	
	No.	*%*	*No.*	*%*
1. Alive neonate	147**	89.0	196	98.0
2. Dead neonate	18**	10.9	4	2.0
3. Birth weight(Kgm):-				
a. < 2.0	12**	7.2	2	1.0
b. 2.0 < 3.0	78**	47.2	42	21.0
c. 3.0- 4.0	70**	42.4	144	72.0
d. > 4.0 kg	5**	3.0	12	6.0
4. Apgar scor				
≤3	10**	6.0	2	1.0
4 - 7	94**	56.9	63	31.5
>7	61**	36.9	135	67.5
Admission to intensive care unit	14**	8.4	2	1.0

DISSCUSSION

Currently it has been suggested that not only primiparous are at high risk but so on multiparous[4]. Parous women with pre-eclampsia constituted about 1% of all deliveries during the study period; similar to that reported by Robson[3] but lower than that reported by Hallak which was 5-7%[2]. Advanced maternal age is one of the risk factors that are associated with pre-eclampsia[9]. The risk of pre-eclampsia in subsequent pregnancy increases with maternal age 1.3 per 5 years of age)[10]. About (1/3)rd of the studied women with age exceeded 35 years; similar to that reported by Mostello[11]. The study found that 45% of parous women with pre-eclampsia were overweight and 22% were obese which is comparable to an other study which stated that maternal overweight & obesity regarded as risk factors for pre-eclampsia[12]. Also the study found that 7% of parous women with pre-eclampsia had chronic hypertension which is comparable to an other study which stated that chronic hypertension is regarded as risk factor for pre-eclampsia[13]. The study found that the overall recurrence rate of pre-eclampcia was about 55% which is comparable to the rate of 47-65% which was reported by Sibai, et al[14], and it was 3-6 times more than the rate for

nulliparous and higher than the rate of 18% reported by Michael, et al[15]. Another variable that increases the risk of pre-eclampcia in subsequent pregnancies is interval from previous pregnancy with pre-eclampcia; as the interval is prolong; the risk will increase[4], and the risk increase by (1.5 per 5 years interval)[10]. This concept is also confirmed in this research. The study found that previous preterm labor was significantly present in about (11%) compared to (1.5%) of the control group. This is explained by the concept that (history of term pregnancy >37 weeks convey substantial protection against pre-eclampsia in subsequent pregnancies)[16] while (previous preterm birth did not change the incidence of pre-eclampsia in subsequent pregnancies)[17]. The study found that 45% of parous women with pre-eclampsia had inadequate antenatal care which is comparable to other study which stated that inadequate antenatal care regarded as a risk factor for pre-eclampsia in subsequent pregnancies[12]. The study found that (56%) of parous women with pre-eclapmsia had family history of pre-eclampsia; this explained the role of inherited susptability in maternal genes so a strong association exist between sisters and occurrence in daughters of mothers who had pre-eclampsia[18]. Significantly; higher rate of cesarean sections & preterm delivery found among parous women with pre-eclampsia (27.8%&15%) respectively which is comparable to the rate of (32%&20%) that reported by Michael, et al[15]. This may be due to urgent demand for termination of pregnancy as the role in the management of sever pre-eclampsia and eclamptic fit. The study found that abruptio placentae (6%) and postpartum hemorrhage (4.8%) affect significantly parous women with pre-eclampsia which is comparable to the rate of (4.7% & 3.9%) respectively that reported in other studies[15]. Eclamptic fit accounted the major indication for cesarean section as it affect (9.6%) of parous women with pre-eclampsia and necessitate early intervention by termination of pregnancy. Fetal death was the end result in about (11%) of parous women with pre-eclampsia which represent significant percentage and higher than (2.8%) reported by Michael, et al[15]. This difference may be due to the variation in approach of management and control of pre-eclampsia. Parous women with pre-eclampsia tend to have adverse prenatal outcome[13]. This can confirmed by the result of high prenatal death, low birth weight and low apgar scor with need for admission to premature intensive care unit in this research. In conclusion; recurrence of pre-eclampsia is still high in subsequent pregnancies with poor outcome. This represents an important burden on obstetrical services; so that early diagnosis and control of pre-eclampsia is essential assuming the current protocols in management with early regular antenatal care.

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