

Abstract

Background: Pre-eclampsia is a common problem in pregnancy. Women with pre-eclampsia have high blood pressure, protein in their urine, and may develop other symptoms and problems. The more severe pre-eclampsia associated with serious complications to both mother and baby. Pre-eclampsia is detected through blood pressure measurement and urine tests.

Aim: The study is conducted to assess the epidemiological characteristics of preeclamptic women in Tikrit teaching hospital.

Objectives:

1. Recognize the relation between preeclampsia and (age, parity, body mass index, residence, occupation, socioeconomic state, baby gender, duration of pregnancy, mode of delivery, and fetal-maternal complications).
2. Identify the previous obstetrical history, recent pregnancy and family history of preeclamptic women.

Subject and method: The current work represents a descriptive individual type of epidemiological study which is a cross sectional study. The study was conducted in Tikrit Teaching Hospital from 10th of November 2011 to 10th of November 2012. The sample included 91 delivered pre eclamptic women within purperium period and excluded birth before 24 weeks of gestation. Data was collected from delivered women by a questionnaire also maternal height measured and they asked about their weight before pregnancy.

Results: From 6744 births in Tikrit teaching hospital during study period there were 91(1.3%) cases of preeclampsia, preeclampsia lower at age <20 and >40 years old about 4(4.4%), 6(6.6%) subsequently. Preeclampsia more frequent 40(44%) among (2-5) parity group, and more among women lived in urban area 53(58.2%). Regarding prepregnancy BMI, the result showed that 36(39.6%) of preeclamptic women had overweight before pregnancy.

The study showed that 47(51.6%) of preeclamptic women delivered before term, and 41(45.1%) of preeclamptic women delivered by cesarean section. High frequency of maternal and fetal complications 16(59.3%), 13(43.3%) among preeclamptic women who had no antenatal care.

Conclusion: The study concluded that preeclampsia cases more frequent among women with middle age, parity 2-5, overweigh, worker, low socioeconomic level, and they complained from many complications with their fetuses.

Recommendation: Encouraging early booking as well as regular attendance at the antenatal clinic for early diagnosis and prevention of complications.

Introduction

Definition: Preeclampsia is a pregnancy-specific syndrome(1) characterized by the onset of hypertension and proteinuria after 20th week of gestation in women who previously were normotensive(2). Preeclampsia complicates about 3% of all pregnancies(3). Although estimated incidence of preeclampsia in 6–10% of all pregnancies in the United States; the incidence is believed to be even higher in underdeveloped countries(4). Preeclampsia remains a major cause of maternal and prenatal mortality and morbidity(5). The diagnostic criteria for preeclampsia are blood pressure $\geq 140/90$ after 20 weeks gestation, combined with proteinuria ≥ 0.3 g/24 h ($\geq +1$ dipstick) on at least two occasions(6).

Symptoms: Women may have no symptoms at first, or may experience mild symptoms of preeclampsia which include swelling of the hands and face/eyes (edema), sudden weight gain over 1-2 days, or more than 2 pounds a week, but some swelling of the feet and ankles is considered normal during pregnancy. Symptoms of severe preeclampsia include continuous headache, belly pain on the right side below the ribs or right shoulder, other symptoms of severe pre eclampsia include irritability, decreased urine output or not urinating very often, nausea and vomiting, vision changes, including temporary blindness, seeing flashing lights or spots, sensitivity to light, and blurred vision(7).

Examination and investigation: During physical examination a doctor notes high blood pressure, usually higher than 140/90 mm/Hg, swelling in the hands and face (weight gain above expected). Blood and urine tests may show protein in the urine (proteinuria), elevated liver enzymes, platelet count less than 100,000. Ultrasound done to monitor the baby's health and pre eclampsia complications(7)

Causes: The exact cause of pre-eclampsia is unknown, but it is thought to be caused by a defect in the placenta. It is thought that the blood vessels in the placenta do not develop properly which affects the transfer of nutrients and oxygen to the baby(8). The pre-eclampsia syndrome is thought in many cases to be caused if there is shallow implanted placenta and inadequate trophoblast invasion of the spiral arteries in early pregnancy, placenta becomes hypoxic, leading to an immune reaction characterized by secretion of up regulated inflammatory mediators from the placenta, and acting on the vascular endothelium. The shallow implantation is thought to stem from the maternal immune system's response to the placenta and refers to evidence suggesting a lack of established immunological tolerance in pregnancy. This results in an immune response against paternal antigens from the fetus and its placenta. In some cases of pre-eclampsia it is thought that the mother lacks the receptors for the proteins. This view is also consistent with evidence showing many miscarriages to be an immunological disorder where the mother's immune system "unleashes a destructive attack on the tissues of the developing child"(9). In many cases of the pre-eclampsia syndrome, however, the maternal response to the placenta appears to have allowed for normal implantation. It is possible that women with higher baseline levels of inflammation stemming from underlying conditions such as chronic hypertension or autoimmune disease may have less tolerance for the inflammatory burden of pregnancy(10,11). Whatever the mechanism pre-eclampsia affect various other parts of the mother's body when the substances released from the placenta go around the body and can damage blood vessels in the mother's body, making them leak (8)

Risk factors: There is an increased risk of developing pre-eclampsia if the mother nulliparity or pregnant for the first time by a new partner, family or own history of preeclampsia, diabetes, BMI higher than normal, multiple pregnancy, maternal age (less than 20 and greater than 35

years)(8,12,13), systemic lupus erythematosus (SLE), or chronic (persistent) renal disease, hydatidiform mole, hydrops fetalis, oocyte donation or donor insemination, chronic hypertension and chronic autoimmune disease (7,14).

Differential diagnosis: Pre-eclampsia can mimic and be confused with many other diseases, including chronic hypertension, chronic renal disease, primary seizure disorders, gallbladder and pancreatic disease, immune or thrombotic thrombocytopenic purpura, antiphospholipid syndrome and hemolytic-uremic syndrome(15).

Complications: Most women with pre-eclampsia do not develop serious complications. The Complications for the mother can include eclampsia, liver, kidney, and lung problems, blood clotting disorder, stroke (bleeding into the brain), severe bleeding from the placenta, pulmonary oedema, HELLP syndrome (Haemolysis, Elevated Liver enzymes and Low Platelets). Pregnant needs for cesarean delivery. Complications for the baby include: Reduced nutrients and oxygen received through the placenta, increased risk of intrauterine growth restriction and death. Also preterm birth, respiratory problems (intrauterine and early neonatal asphyxia), and mental retardation(16).

Treatment: The only way to cure preeclampsia is to deliver the baby. If your baby is developed enough (usually 37 weeks or later). The doctor will probably recommend bed rest, lying on your left side most or all of the time drinking plenty of water, eating less salt, frequent doctor visits to make sure that pregnant and her baby are doing well, medicines to lower her blood pressure (sometimes)(7).

Prognosis: Sign and symptoms of preeclampsia usually go away within 6 weeks after delivery(7). **Prevention:** There is no known way to prevent preeclampsia 100%. It is important for all pregnant

women to start prenatal care early and continue it through the pregnancy(7). Antiplatelets therapy, in particular, low dose (< 75 mg) aspirin, reduces the risk of pre-eclampsia by around 15% for women at both low and high risk. There appears to be a similar reduction in the risk of perinatal death. Aspirin should be considered, particularly for women at high risk(7).

Subject and method: The current work represents a descriptive individual type of epidemiological study which is a cross sectional study. The study was conducted in Tikrit Teaching Hospital from 10th of November 2011 to 10th of November 2012. The study group included 91 delivered pre eclamptic women within purperium period and excluded birth before 24 weeks of gestation. Data was collected from delivered women by direct interview in the labour ward, labour room, and outpatient clinic of obstetric and gynecology in Tikrit Teaching Hospital. Data include age, parity, residence, duration of pregnancy, mode of delivery, previous medical and obstetrical history of women and other important information, frequency of antenatal visits (Appendix I)(17), also maternal height measured and they asked about their weight before pregnancy then body mass index calculated. Data represented by a suitable figures and tables.

Results

The study included 91 preeclamptic cases delivered in Tikrit teaching hospital. Table 1 shows that 37(40.7%) of preeclamptic women aged (35-39.11) years old. Preeclampsia lower at age <20 and >40 years old about 4(4.4%), 6(6.6%) subsequently. Preeclampsia more frequent 40(44%) among (2-5) parity group Table-2. Figure 1 represent that preeclampsia more among women lived in urban area 53(58.2%). About 56(61.5%) of preeclamptic women were worker figure-2. The result found that preeclampsia higher 41(45.1%) among women with middle socioeconomic level and lower 16(17.5%) than among women with high socioeconomic

level Table3. Regarding prepregnancy BMI, the result showed that 36(39.6%) of preeclamptic women had overweight before pregnancy as in table4. The study showed that 47(51.6%) of preeclamptic women delivered before term, About 41(45.1%) of preeclamptic women delivered by cesarean section, 29(70.7%) of them were elective cesarean section (Table-5, and table-6 subsequently). Figure-3 showed that 59(57.3%) of preeclamptic women delivered male baby. From 91 preeclamptic women, there were 12(13.2%) of them had multiple pregnancy (Figure-4). High frequency of maternal and fetal complications 16(59.3%), 13(43.3%) among preeclamptic women who had no antenatal care (Table-7). Regarding previous history of preeclamptic women, there were 64 women with <2years spacing and 6 for >5years, 38 of cases with previous history of preeclampsia, 23 of women had history of abortion. But regarding history of recent pregnancy, there were 47 preterm birth, 32 of babies with respiratory distress syndrome, and 19 women had antepartum hemorrhage. Family history was positive in 21 cases, Table-8.

Discussion

Table 1 shows that 37(40.7%) of preeclamptic women aged (35-39.11) years old. Preeclampsia lower at age <20 and >40 years old about (4.4%), (6.6%) subsequently, this may be due to decrease frequency of pregnancies at that age in comparison with other age group. Other study revealed that preeclampsia were more frequently among younger than 20 years or older than 35 years old(18), also other studies assured that >40 years old women had a twice risk of preeclampsia than younger women(19), while Shamsi et al found that there is no relation between age and occurrence of preeclampsia(20). Preeclampsia more frequent 40(44%) among (2-5) parity group, this result disagreed with other study that showed nulliparity had higher risk of preeclampsia than other parity group (18)Table-2 . Figure 1 represent that

preeclampsia more among women lived in urban area (58.2%) this may be because of stressful lifestyle in the city more than in the village, also the study included more worker women in urban area who were attended the hospital more than women who lived in rural area who were not recorded in the hospital. Rural women preferred midwives consultation and they delivered at home and sometimes attended nearby primary health care center. The current study disagreed with other study that showed increased preeclampsia among rural women(21)

About (61.5%) of preeclamptic women were worker this may be due to the load of duties at her job in addition to home. Several studies agreed with current result, one study interpreted that because higher proportion of worker mothers with university or above education primiparous, and slightly older than non employers(17,22). Other studies reported same results but they interpreted that preeclampsia result from high physical work load and high psychological stress(17). Physically demanding work may increase catecholamine levels which may lead to decrease uterine blood flow and therefore induce preeclampsia(23) Figure-2. The result found that preeclampsia higher (45.1%) among women with middle socioeconomic level and lower (17.5%) among women with high socioeconomic level, but other study revealed that preeclampsia increased among poorer and illiterate(22) Table3. Regarding prepregnancy BMI, the result showed that (39.6%) of preeclamptic women had overweight before pregnancy. Other studies agreed that overweight and obese women associated with increased risk of preeclampsia(48,23,24,25,26,27)Table4 . The study showed that (51.6%) of preeclamptic women delivered before term, this result agreed with other studies that assured the association between preeclampsia and preterm birth(19,22) Table-5. About (45.1%) of preeclamptic women delivered by cesarean section, (70.7%) of them were elective cesarean section this may be diagnosed women with preeclampsia had higher rate of

intervention as elective cesarean section. Other studies revealed same result and they found that intervention by labor induction and elective cesarean section associated with decreased morbidity and better maternal and fetal outcome(18,22,25,28,29)Table-6

Result represented in figure-3 showed that 59(57.3%) of preeclamptic women delivered male baby, but other study observed that male versus female babies have greater disadvantage in pregnancy outcome specially preeclampsia, and they thought that fetal and placental growth are different by baby sex(30). From 91 preeclamptic women, there were 12(13.2%) of them had multiple pregnancy which was low in comparison with other studies that they observed an association between multiple pregnancy and increased occurrence of preeclampsia(24,31)Figure-5. High frequency of maternal and fetal complications (59.3%), (43.3%) among preeclamptic women who had no antenatal care, this result assured that antenatal care very important to assess risk at booking so that a suitable surveillance routine to detect preeclampsia can be planned for the rest of pregnancy. Other study in Saudia Arabia showed that women who had no antenatal care or late booking were associated with greater risk of preeclampsia complications(16), in comparison with women who had good antenatal care were associated with good obstetric and neonatal outcome at delivery and after(21)table-7. Regarding history of recent pregnancy, there were 47 preterm birth, 32 of babies with respiratory distress syndrome, and 19 women had antepartum hemorrhage. About infertility, the study showed that history of infertility an important predictor factor for preeclampsia(14), other Norwegian study support the hypothesis that infertility, abortion, and preeclampsia had share elements of the etiological factors(21). Results revealed 8 stillbirth and neonatal death for each one, a study in the united state observed that the increased risk of stillbirth and neonatal death were higher among preeclamptic women than non (18). Also

other study revealed the association between preeclampsia and increased risk of maternal-perinatal adverse outcome as eclampsia, antepartum bleeding, HELLP (32) low birth weight (33). 38 women had history of preeclampsia, other study observed that about 25% of preeclamptic cases in multiparous women occur in those with a prior preeclampsia (31,34,35). Many cases (table-8) had chronic diseases, this result assured other studies prevalence of chronic diseases (hypertension, diabetes) were higher in women who developed preeclampsia than who did not (36,37,38). Regarding renal diseases e.g. urinary tract infection higher in women with preeclampsia (29,38). Stamilio found an association between preeclampsia and autoimmune diseases (29,39). Family history was positive in 21 cases, positive family history of preeclampsia (sisters, mothers) nearly triple the risk of preeclampsia (31,40,41,42). Results showed that 64 of women with <2years spacing period and 6 for >5years, other studies observed that increasing spacing interval more than 59 months or short spacing interval less than 1years increased the possibility of preeclampsia occurrence with increased risk of complications if compared to women with 1-5 years interval (43,44,45). Table-8

Conclusion

1. Preeclampsia more frequent among overweight, middle aged women, and their parity 2-5.
2. Preeclampsia more frequent among women lived in urban area, workers, and those from middle socioeconomic level
3. preeclamptic women frequently delivered before term, and high percentage of them by cesarean section
4. Preeclamptic women in this study frequently had bad obstetrical history.

Recommendation

1. Diagnose women who have risk factors will help to: Anticipate the possibility of a hypertensive disorder and its complications developing before they actually happen, and offer counselling to the woman and her partner and family about the danger symptoms of severe pre-eclampsia/eclampsia, so they can take action quickly if needed.
2. There is a need for large, well-designed studies suggests supplements may protect against preeclampsia

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Table -1- Relation between age and preeclampsia.

Age (years)	Number	%
17-	4	4.4
20-	10	11
25-	12	13.2
30-	22	24.1
35-	37	40.7
40-44	6	6.6
Total	91	100

Table- 2- Relation between parity and preeclampsia

Parity	Number	%
1	19	20.9
2-5	40	44
>5	32	35.2
Total	91	100

Table-3- Relation between socioeconomic state and preeclampsia

Socio economic level	Number	%
Low	34	37.4
Middle	41	45.1
High	16	17.5
Total	91	100

Table-4- Relation between body mass index (before pregnancy) and preeclampsia

Body mass index(Kg/m ²)	Number	%
<18	3	3.3
18-24.9	19	20.9
25-29.9	28	30.8
30-34.9	36	39.6
35-39.9	2	2.2
≥ 40	2	2.2
Total	91	100

Table-5- Relation between duration of pregnancy and preeclampsia

Duration	Number	%
Preterm	47	51.6
Full term	39	42.9
Post term	5	5.5
Total	91	100

Table-6- Relation between mode of delivery and preeclampsia.

Mode of delivery	Number	%
Normal vaginal delivery	17	18.6
Induced vaginal delivery	33	36.2
Cesarean section:	41	45.1
Elective	29	70.7
Emergency	12	29.3
Total	91	100

Table-7- Relation between antenatal care and complications (maternal and fetal)

Antenatal care	Maternal complications		Fetal complications	
	Number	%	Number	%
Adequate	Zero	0	1	3.3
Intermediate	3	11.1	7	23.3
Inadequate	8	29.6	9	30
No care	16	59.3	13	43.3
Total	27	100	30	100

Table-8- History of women with preeclampsia

		Frequency
Women with previous history of:	Infertility	12
	Abortion	23
	Stillbirth	6
	Neonatal death	3
	Spacing <2 years	64
	Spacing >5 years	6
	Previous preeclampsia	38
	Hypertension	13
	Diabetes mellitus	4
	Renal diseases	9
	Autoimmune diseases	2
	Family history of preeclampsia	21
History of recent pregnancy:	Antepartum hemorrhage	19
	Postpartum hemorrhage	3
	Premature rupture of membrane	11
	Pulmonary odema	1
	Emergency cesarean section	12
	Intrauterine growth restriction	12
	Stillbirth	8
	Preterm	47
	Respiratory distress syndrome	32
	Neonatal death	8

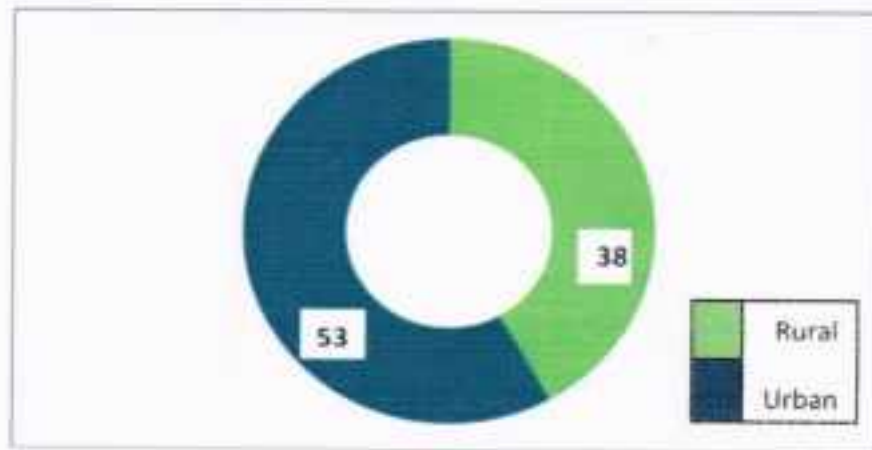


Figure-1- Relation between residence and Preeclampsia

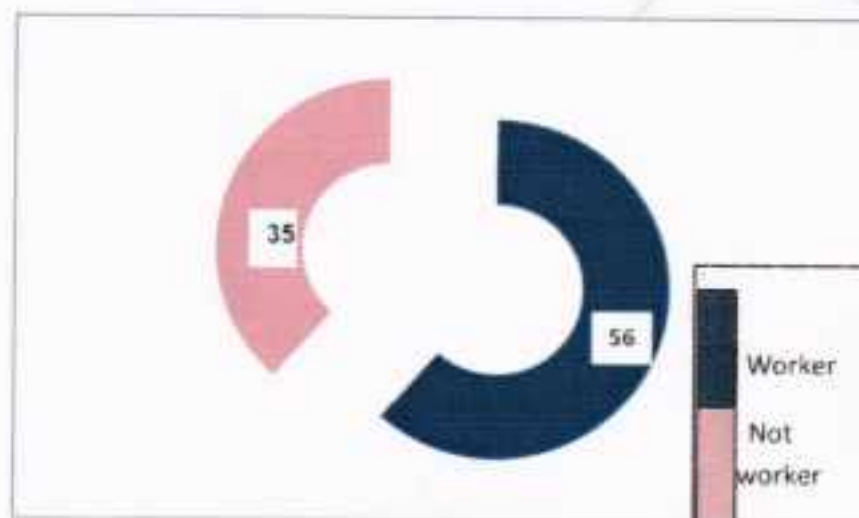


Figure-2- Relation between occupation and preeclampsia

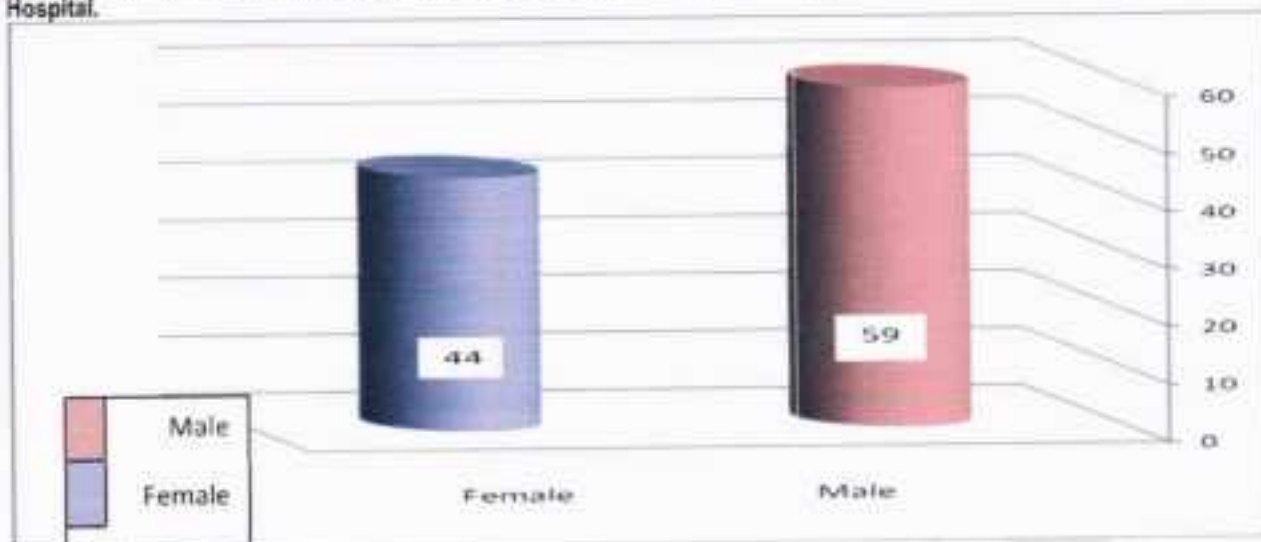


Figure-3- Relation between baby gender and preeclampsia

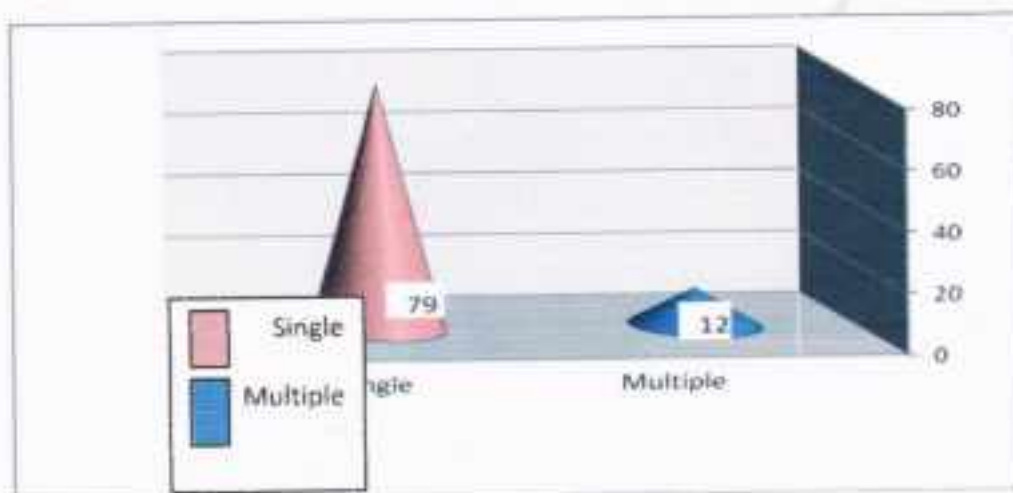


Figure-4- Relation between preeclampsia and multiple pregnancies