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RISK FACTORS OF PRE-ECLAMPSIA AMONG PREGNANT WOMEN IN ISMAILIA GOVERNMENTAL HOSPITALS

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Abstract:
Preeclampsia (PE) is a pregnancy specific syndrome characterized by the onset of hypertension and proteinuria after 20th week of gestation in women who previously were normotensive. **Aim:** The aim of this study was to explore the potential risk factors of preeclampsia among pregnant women at Ismailia governmental hospitals. **Design:** Descriptive exploratory research design was adopted. **Setting:** Data was collected from obstetric and gynecological departments at Ismailia general hospital and Suez Canal university hospital. **Tool for data collection:** A structured interviewing tool covering demographic characteristics and laboratory results record was used. **Results**: Revealed those risk factors of preeclampsia among age class 18 to less than 29 year old (54.3%) with mean ±SD 28.80±5.57. More than half (60.0%) of them received a secondary school education, 56.4% of them were obese. Only 29.7% of them were practicing exercises, 68.2% of them were passive smokers and 41.4% of them fall in 1yrs ≤ 3yrs interval between pregnancies. **Conclusion:** In view of the above findings, preeclampsia mostly affects age of 18: 29 year old, housewives, secondary school education, decrease family income, summer, season, obesity were the highest risk factors of preeclampsia **Recommendation:** Raise awareness of preeclamptic women about the optimal body mass index, about healthy foods, good health habits in daily life and further studies are necessary to examine the hazards of preeclampsia on pregnancy outcome.
Key words: risk factors; and preeclampsia

Introduction:

Preeclampsia (PE) is a pregnancy specific syndrome characterized by the onset of hypertension and proteinuria after the 20th week of gestation in women who previously were normotensive. Preeclampsia can be subdivided into mild and severe, with severe forms exhibiting more prominent signs and symptoms of end organ damage that may result in life threatening disease (***Bakes et al., 2011***).

Preeclampsia is a protein disorder that involves many organ systems, can occur in early pregnancy termed as "early onset preeclampsia" at <32 wk gestation and late onset preeclampsia which occurs after 32 weeks of gestation. However, endothelial dysfunction is common in both early and late onset, responsible for the symptoms like proteinuria and hypertension. Failure to control these symptoms would result in fetal prematurity and premature delivery. In developing countries with limited access to health care (***Petla et al., 2013***).

The maternity nurse has a significant role in providing care for high risk preeclamptic women. She should recognize that the main stay of treatment for preeclampsia remains ending the pregnancy by delivering the fetus and the placenta. This can be a significant problem for the baby if preeclampsia occurs at 24-28 weeks of gestation. Thus, many strategies have been proposed to delay the need for delivery **(*Scott et al., 2009*)**.

Significance of the study

Maternal mortality is one of the world's most problems. Every day, around 1600 women die due to complications of pregnancy. Eighty percent of these deaths are largely preventable or treatable at little or no extra cost, even in resource-poor settings. In Egypt the national maternal mortality ratio was 130 in 2000, in the year 2005 it was 84 and in 2009 the maternal mortality ratio was 59 in Egypt (***El-Gharib et al, 2010***).

Aim of the study

The aim of this study was to explore the potential risk factors of preeclampsia among pregnant women at Ismailia governmental hospitals (Ismailia general hospital and Suez Canal university hospital).

Research question:

What are the risk factors of preeclampsia among pregnant women at Ismailia governmental hospitals?

SUBJECTS AND METHODS:

Research design:

Descriptive exploratory design was adopted to achieve the aim of the study.

Setting:

The study was conducted in obstetric and gynecological department at Ismailia Governmental hospitals (Suez Canal University hospital and Ismailia general hospitals).

Subjects:

Inclusion criteria:

Gestational age ≥ 20 weeks gestation; medical diagnosis of preeclampsia. Exclusion criteria: Woman age < 18 years and eclampsia.

A purposive sample consisted of 195 preeclamptic women were recruited in the above mentioned setting.

Tool of data collection:

Tool I: *A structured interviewing tool:* was developed by the researcher to collect the necessary data for achieving the study objectives. It composed four parts:

- ***Part 1*:** Sociodemographic characteristics of the preeclamptic women, such as age, educational level, marital status, occupation, residence, season, family income, number

of family members , age at marriage, degree of consanguineous marriage and recording body mass index by the following formula: BMI= Wt kg \ Ht m2 =…….kg.

- ***Part 2***: includes daily activity: including daily working hours, type and time of exercise, daily habits: including sleeping hours, active or passive smoking, how many cigarettes daily, nutritional life style: including questions about nutritional habits such as carbohydrate, protein, fat, calcium, vitamin C, vitamin E, sodium, spicy food and pickles, drinking such as red tea, green tea, coffee, nescafe with milk and cola.
- ***Part 3***: includes obstetric profile: such as gravidity, parity, abortion, the number of live births, mode of the last delivery, the interval between pregnancy, gestational age, antenatal care and number of visits. Family planning history: such as compined oral contraceptive pills, progestogen only pills, intra uterine device, hormonal injection, condom and spermicides. Past obstetric risk factors: including: previous preeclampsia, ectopic pregnancy, vesicular mole, postpartum hemorrhage, congenital anomalies, placenta previa, fetal loss or still birth and twins.
- ***Part 4***: includes personal medical history: such as diabetes mellitus, chronic hypertension, cardiac, liver and kidney disease. Family medical history: include previous PE, eclampsia, preexisting hypertension and obesity.

Tool II*: Laboratory record:*

For recording data regarding the following: blood test for blood group, Rh factor and urine analysis for sugar.

II. Procedure

Preparatory phase:

An official permission was obtained by submission of an official letter from the faculty of nursing Suez Canal University to the directors and heads of Obstetric and gynecological wards to the responsible authorities in the Suez Canal University Hospital and General Hospital to obtain the approval to conduct this study.

Validity of the tools:

Tools were reviewed by 5 experts to evaluate its clarity, relevance, applicability, comprehensiveness, understanding and ease for implementation. According to their suggestions, modifications were applied.

Pilot study

A pilot study was carried out after the development of tool and before starting the data

collection. 10% of study sample, were selected to test the validity of the tool for data collection. The sample of preeclamptic women included in the pilot study was excluded from the study.

Ethical Considerations:

Written approvals were obtained from the preeclamptic women after they were informed about the nature of the study. Preeclamptic women were assured that data obtained was confidential and used only for the purpose of the study. All ethical issues were ensured to all preeclamptic women recruited in the study including confidentiality and the right to withdraw from the study at any time.

III. STATISTICAL DESIGN

Statistical analysis

Data analysis was performed using IBM SPSS statistical software version 13. The data were explored. Descriptive statistics with mean and standard deviation (SD) for continuous variables and frequency for categorical variables were analyzed.

Total risk scoring system: was evaluated for each of the studied variables was calculated as:

- No risk (0%); Mild risk (1% - less than 50%); Moderate risk (50% - less than75%); Sever risk (more than 75%)

Results:

Table 1 demonstrated that, nearly half of preeclamptic women used compined oral contraceptive pills (47.9%), followed by hormonal injection progestogen, progestogen only pills and condom (17.9%, 17.1% & 11.4% respectively).

Table (1): Distribution of Preeclamptic Women according to Use of Family Planning Methods N= 140.

Variable	Frequency	%
Compined oral contraceptive pills (COCs)	67	47.9
Hormonal injection	25	17.9
Progestogen only pills(Pops)	24	17.1
Condom	16	11.4
Lactation amenorrhea	3	2.2
Intra uterine devise (IUD)	5	3.5

Table 2 illustrated that, more than one third of preeclamptic women 41.0% were get pregnant two times, while, more than one third of them 40.0% were nulliparas. As regards about 32.8% one third of them had 1-2 abortion, 41.4% of them fall in 1yrs ≤ 3yrs interval between pregnancies. Concerning mode of last delivery it was found normal spontaneous delivery, vaginal delivery with episiotomy, caesarean section (25.0%, 27.8% &45.8% respectively) .Nearly three quarter of preeclamptic women in gestational age 20:28 weeks gestation (74.2%), with mean ±SD 29.9±4.16, high percentage of them (95.4%) received antenatal care during 1st trimester. 81.5% of preeclamptic women had visits ≥ 5

and above three quarter of them had desired pregnancy (89.2%).

Table (2): Distribution of Preeclamptic Women according to Obstetric Profile.

Variable		Frequency	%
Gravidity range		**N=195**	
Primigravida		55	28.2
1-2		80	41.0
3		60	30.8
Parity range			
Nullipara		78	40.0
1-3		77	39.5
≥4		40	20. 6
Number of abortion			
0		121	62.0
1-2		64	32.8
≥3		10	5.2
Interval between pregnancy N = 140			
≤ 1 yrs		31	22.2
1 yrs ≤ 3 yrs		58	41.4
> 3 yrs		51	36.4
Mode of last delivery		**N = 140**	
Normal spontaneous delivery		35	25.0
Instrumental delivery		2	1.4
Vaginal delivery with episiotomy		39	27.8
Caesarean section		64	45.8
Gestational age	20-28 weeks	145	74.2
	29-40 weeks	50	25.8
	Mean ±SD	**29.9±4.16**	
Onset of Antenatal Care	1st trimester	186	95.4
	2nd trimester	9	4.6
Number of visits	<5 visits	36	18.5
	≥ 5visits	159	81.5
Desired pregnancy	Yes	174	89.2
	No	21	10.8

Table 3 illusterated that, one third of preeclamptic women had previous preeclampsia (32.2%), followed by urinary tract infection, previous ectopic pregnancy, oligohydraminous, twins and placenta previa (13.5%, 12.8%, 9.2%, 7.9% & 6.4% respectively).

Table (3): Distribution of Preeclamptic Women according to Previous Obstetric Risk Factors N=140.

Variable	Frequency	%
Previous preeclampsia	46	32.2
Urinary tract infection	19	13.5
Previous ectopic pregnancy	18	12.8
Oligohydraminous	13	9.2
Twins	11	7.9
Placenta previa	9	6.4
Postpartum hemorrhage	4	2.7
Polyhydraminous	3	2.1
Puerperal sepsis	3	2.1
Congenital anomalies	3	2.1
Intrauterine fetal death	2	1.4
Antepartum hemorrhage	2	1.4
Preterm labor	2	1.4
Neonatal death	1	1.3

Table 4 demonstrated that, near one quarter of preeclamptic women medical history as preexisting hypertension (21.0%), followed by diabetes mellitus, blood transfusion and liver disease (17.4%, 3.1% & 3.1% respectively).

Table (4): Distribution of Preeclamptic Women according to Personal Medical History N=195.

Variable	Frequency	%
Preexisting hypertension	41	21.0
Diabetes mellitus	34	17.4
Blood transfusion	6	3.1
Liver disease	6	3.1
Allergy	5	2.5
Tumor disorder	3	1.5
Cardiac disease	2	1.0
Kidney disease	2	1.0

DISCUSSION

Preeclampsia (PE) is described as pregnancy specific syndrome, multifactorial, associated with reduced organ perfusion secondary to vasospasm and endothelial activation.

The present study findings revealed that, nearly three quarter of preeclamptic women take compined oral contraceptive pills, above one quarter of them used hormonal injection, followed by progestogen only pills and condom. Similar result was reported by ***(Direkvand et al., 2012)*** reported that, most of sample takes compound oral contraceptive pill. Also, ***(Ahenkorah, 2009)*** stated that, women used contraceptives pills from study were not protected from PIH.

Others study not support the results of the present study, ***(Laura et al., 2012)*** found that, women with PE were more likely to use condoms as a contraceptive method. ***(Shamsi et al., 2010)*** stated that, most of participants use condom as Contraceptive method. Also, ***(Ahenkorah, 2009)*** reported that, the risk among women whose partners used condoms was 7 times. Contraceptive use in both the male and female partner positively associated with the risk of PIH in the study. This might also explain the high risk observed in women used condom as a means of contraception because the use of condom reduces or limits exposure of the female genital tract to the male partner's spermatozoa.

According obstetric profile in the present study, more than one third of preeclamptic women were gravidity1-2. Other studies reported opposite results, many study reported PE is a disease with first pregnancies. ***(Al-Jameil et al., 2014)*** who reported that, more women's in first pregnancy risks for PE. ***(Sultana and Aparna, 2013)*** found that, primigravida accounted for 66.5% in PE compared to multigravida. Also, ***(Arulkumaran and Lightstone, 2013)*** reported that, first pregnancy is risk factor for PE. ***(Modiba, 2013)*** who revealed that, primigravida more likely to develop PE compared to multigravida. ***(Laura et al., 2012); (Shazia et al., 2011)*** found that, being primigravida remained as factors with the development of PE. ***(Visintin et al., 2010); (Ahenkorah, 2009)*** suggested that, PE is considered to be a disease largely associated with first pregnancies.

As regards about one third of preeclamptic women had 1-2 abortion 32.8% in the present study .Similar finding reported by ***(Trogstad and Magnus, 2008)*** who found that, previous abortion is risk for PE. Other studies show opposite result, ***(Harutyunyan, 2009)*** found that, previous abortion decreases the risk of PE. ***(Ahenkorah, 2009)***

revealed that, none of the abortion types in both nulliparas and multiparous subjects is associated with PE.

The present study findings revealed that, Interval between pregnancies in the present study risks 1 yrs ≥ 3 yrs .This result agreement with ***(Christina et al., 2013)*** found that, time interval between pregnancies 2 years that increase risk for PE. ***(El-Mosely et al., 2011)*** reported that, Interval between pregnancies 3 years is risk factor for PE. Also, ***(Luealon and Phupong, 2010)*** found that, birth spacing 3 years as risk factors for PE.

Nearly half of preeclamptic women in the present study were delivery by caesarean section (CS). This finding matched with those of, ***(Guerrier et al., 2013)*** who found that, the proportion of CS was higher among preeclamptic women. ***(Christina et al., 2013)*** reported that, mode of delivery by CS increase with women. Also, ***(Luealon and Phupong, 2010)*** revealed that, CS delivery was higher in women with PE. ***(Sangkomkamhang et al., 2010)*** shown that, the most frequent indications of CS were the severity of the condition, fetal distress and reduced serious complications of the fetus as well as the preeclamptic mother. Furthermore, ***(Ahenkorah, 2009)*** found that, CS delivery was observed to be risk factors for PE. ***(Sadat et al., 2007)*** reported that, thirty percent of women occurrence being more frequent for required CS. ***(Yucesoy, 2005)*** reported that, CS rate was 58.8% in the study that increase risk of PE.

Three quarter of preeclamptic women in the present study with gestational age 20:28 weeks, with mean ±SD (29.9±4.16). Other finding is not accordance with the present study, ***(Fatemeh & Marziyeh, 2010)*** found that, the mean gestational age was 35.37±2.25 weeks in preeclamptic women. More recently, ***(Sadat et al., 2007)*** who found that, in Iran the mean gestational age in PE women was higher 39±2. ***(Woldeselassie, 2005)*** in Namibia found that, the mean gestational age was the least among women with severe PE. This may be due to the difference in the size of the sample and the chosen design.

About one third of preeclamptic women had previous history of PE, followed by urinary tract infection, previous ectopic pregnancy, oligohydraminous, twins and placenta previa .This finding is in agreement with, ***(Guerrier et al., 2013)*** who found that, personal history of PE increase risk. ***(Arulkumaran and Lightstone, 2013)*** stated that, increase women risk with prior history of PE. Similarly,

(Direkvand et al., 2012); (Akolekar et al., 2013) determined that, history of PE is important predictor factor for PE. ***(Kashanian et al., 2011)*** reported that, history of PE during previous pregnancy is the most risk factors of PE. Furthermore, ***(Pottecher & Luton, 2011)*** mentioned that, the risk of recurrence PE during a subsequent pregnancy has to be considered. Women at high risk are those with a personal history of severe PE. Also, ***Semenovakaya & Erogul, (2010); Barton & Sibai, (2008); Mostello et al., (2008) & Rowe et al., (2008)*** reported that, previous history of PE risk for recurrence PE.

above one third of preeclamptic women family medical history were obese, about one quarter of them had preexisting hypertension, followed by diabetes mellitus (DM) and previous PE .This finding is agreement with, ***(Mehul et al., 2012); (Ganesh, 2010)*** stated that, family history of (PIH) pregnancy induced hypertension as a risk factor for PE. Also, ***(Shamsi et al., 2010)*** reported that, positive family history of chronic hypertension is risk of PE.

CONCLUSION

In view of the above findings, preeclampsia is mostly affect age from 18: 29 year old, housewives, secondary school education, decrease family income, summer season, obesity were the highest risk factors of preeclampsia .Also, bad nutritional habits, delivery by CS, passive smoking, multiparous women, previous abortion, increase interval between pregnancies, using oral contraceptive method, family h/o PIH, DM and previous PE.

RECOMMENDATIONS

In the light of the findings of this study, the following recommendations are proposed:

1. Raise awareness of preeclamptic women about optimal body mass index.
2. Raise awareness for teenage pregnancy.
3. Raise awareness of preeclamptic women about healthy foods and good health habits in daily life.
4. Raise awareness of preeclamptic women about importance of antenatal care.
5. Further studies are necessary to examine the hazards of preeclampsia on pregnancy outcome.
6. Health care providers should inform women about the known risk factors of preeclampsia development.

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