ORIGINAL ARTICLE DOI: https://doi.org/10.52206/jsmc.2023.13.4.822 OPEN ACCESS

Association of Pre-eclampsia in Women with Advanced Maternal Age

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ABSTRACT

Background: Preeclampsia: Preeclampsia is a serious condition that typically occurs after the 20th week of pregnancy. Preeclampsia can occur in women of all ages, but the risk increases with certain factors.
Objectives: This study aimed to find out the association of pre eclampsia in women with advanced maternal age.
Material & Methods: This cross-sectional study was carried out in high dependency unit (HDU) of the Obstetrics and Gynecology Department of the Fauji Foundation Hospital, Rawalpindi, from 30th November 2021 to 29th May 2022. Total of 260 pregnant patients were selected through non-probability, sequential sampling. After taking written informed consent, information on the mother's age (measured in categories) and parity for each patient was gathered on a pre-made Performa. SPSS version 20 software was used to analyze the data. With a p-value of 0.05 considered significant, the chi-square test was employed to compare the maternal age to pre-eclampsia.
Results: The mean age of the participants was 27.9± 6.02 years. Pre-eclampsia in pregnant women was discovered in 32 (12.3%) individuals. It was found in 21% of patients having aged <20 years, in 9.0% of patients having age 20-25 years, in 5.4% patients having age 26-30 years, in 14.2% patients having age 31-35 years and 27.5% % in patients having age >35 years and the results were statistically significant.
Conclusion: The current study's conclusions indicate that pre-eclampsia affects pregnant women quite frequently and that advance maternal age is a risk factor for the disease.
Keywords: Advanced maternal age, Pre-eclampsia, Pregnancy.

This article may be cited as: Naeem Z, Gul S, Masud A, Abrar F, Dureshahwar, Tahir Z. Association of Pre-eclampsia in Women with Advanced Maternal Age. J Saidu Med Coll Swat 2024;14(1):14-18. DOI: https://doi.org/10.52206/jsmc.2023.13.4.822

INTRODUCTION

Pre-eclampsia (PE), particularly in underdeveloped countries, has a significant impact on both maternal and neonatal health.[1] Preeclampsia is a medical condition that develops after 20 weeks of pregnancy and can happen up to six weeks postpartum. Vasospasm and severe vascular endothelial dysfunction characterize it.[2] It is clinically identified by proteinuria, pathologic edema, and hypertension.[3] About 3-8% of pregnancies are affected with pre-eclampsia, which is linked to a number of issues.[4] It is the significant contributor to maternal and fetal morbidity and mortality. If neglected, it can cause eclampsia.[5] Pre-eclampsia causes uteroplacental insufficiency, which leads to intrauterine growth restriction and pre-term births.[6] Pre-eclampsia affects around 4 million women worldwide annually, resulting in more than 500,000 and 700,000 maternal and perinatal fatalities, respectively.[7]

According to a recent systemic review of worldwide mortality, Pakistan is the sixth most populated country in the world and has the third-highest rate of maternal, fetal, and newborn mortality.[8] In Pakistan, tertiary care facilities admit patients with eclampsia, which is responsible for 34% of maternal mortality.[9] Clinically predicting disease etiology make it easier to initiate timely intervention to prevent maternal and fetal morbidity and mortality.[10] PE is a multisystem and multifactorial disorder, with no known etiology.[11]

With varied degrees of success, many techniques have been employed to anticipate the start of pre-eclampsia.[12] In order to anticipate the disease, these techniques have employed fetal/placental and maternal indicators at various phases of pregnancy.[13] Due to a wide range of social and cultural factors, and the maternal age at childbirth has changed significantly over the past few decades. Worldwide, there has been a documented tendency toward delaying childbearing, which coincides with a drop in teenage pregnancies (e.g., in the USA or China).[14]

According to several studies, pre-eclampsia is significantly associated with advanced mother age.[15] 0thers, however, did not discover any conclusive link between pre-eclampsia and age.[16]

The objective of this study was to ascertain whether advanced maternal age is related to pre-eclampsia. Whether or not advanced maternal age considerably raises the risk of pre-eclampsia is a matter of debate. Therefore, the current study will enable us to ascertain whether or not pre-eclampsia is associated with advanced maternal age in our local community. The results of this study will help identify the pre-eclampsia risk among elderly women, and suitable and timely screening will be recommended in these patients to promptly diagnose and treat pre-eclampsia.

MATERIAL AND METHODS

From 30th November 2021 to 29th May 2022, this cross-sectional study was carried out in the high dependency unit (HDU) of the Obstetrics and Gynecology

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Received: October 01st, 2023 - 1st Revision: December 13th 2023
2nd Revision: January 10th 2024 - Accepted: January 12th, 2024

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The WHO calculator was used to determine the sample size for this investigation, with P=5.6% of required precision.[9] A total of 260 pregnant women made up the study's sample. Non-probability, sequential sampling was used to gather the sample. The study included all expectant mothers who went in for routine antenatal checks and had gestational ages of more than 20 weeks and ages ranging from 16 to 45.

Women who are diagnosed with gestational diabetes mellitus (found on an oral glucose tolerance test), patients without informed permission, and those with a history of cardiovascular diseases were excluded from the study.

Data collection was initiated following acceptance of the research proposal by the hospital's ethical review committee of Fauji Foundation Hospital Rawalpindi, with Ref No. 594/RC/FFH/RWP. The study chose 260 pregnant women in total who met the inclusion criteria. Each patient was asked to sign a written consent form indicating that she was willing to take part in the study.

For each patient, information on the mother's age (measured in categories) and parity was gathered. Pre-eclampsia was diagnosed using the following criteria: onset of hypertension at =20 weeks' gestation, systolic of = 140 mmHg or diastolic blood pressure = 90 mmHg and 24-hours proteinuria more than 30 mg/day.[1] A suitable cuff is used to obtain these measurements twice, four to six hours apart. Based on their age during the presentation, the women were split into 5 groups.

1. <20 years
2. 20 - 25 years
3. 26 - 30 years
4. 31 - 35 years
5. >35 years

A mother was considered to be of advanced maternal age if she was 35 years or older at the time of child birth.[4] Each patient had their blood pressure measured, and the hospital laboratory received lab results to make the operational diagnosis of pre-eclampsia. The researcher recorded all the data that was pertinent to the study on a Proforma that was already planned out. Pregnant women with previous history of pre-eclampsia, renal disorders, autoimmune diseases and multiple gestations were excluded from the study.

SPSS version 19 software was used to analyze the data. Age were computed using means and standard deviations. For maternal age categories, parity, and pre-eclampsia, frequency and percentage were estimated. Through stratification, effect modifiers like gestational age and parity were managed. Chi-square test was used to analyze the comparison between pre-eclampsia and advanced maternal age, with a p-value of 0.05 considered significant.

RESULTS

The mean age of study participants was 27.9 ± 6.02 years ranging from 16 to 45 years. According to Table 01, majority of the women 66 (36.1%) were aged 20 to 25. Table 02 displays the patient distribution by parity. Majority of the patients 195 (75%) were multiparous. Pre-eclampsia in pregnant women was found in 32 (12.3%) of the cases. Pre-eclampsia was found in 21%% of patients having aged <20 years, in 9.0% of patients having age 20 - 25 years, in 5.4% patients having age years, 26 - 30 years, 14.2% patients having age years 31 - 35 years. Highest frequency (27.5 %) was found for patients having age more than 35 years. The results were statistically significant for all age groups except 20 - 25 years (Table 03).

Table 01. Patients distribution based on age (n=260)

Age (years)	Number of Patients	Frequencies (%)
< 20	32	12.3
20 - 25	66	36.1
26 - 30	91	35.0
31 - 35	42	11.1
>35	29	17.3

Mean ± SD = 27.94 ± 6.02 years

Table 02. Patients distribution based on parity (n=260).

Parity	No. of Patients	Frequencies (%)
Nulliparous	65	25.0
Multiparous	195	75.0

Table 03. Frequency of pre-eclampsia based on maternal age in pregnant women.

Age (years)	Pre-eclampsia		p-value
	Yes, n(%)	No,n(%)	
< 20 years	07 (21.8)	25(78.1)	0.03
20 - 25years	06 (9.0)	60 (90.9)	0.17
26 - 30 years	05(5.4)	86 (94.5)	0.00
31 - 35 years	06 (14.2)	36 (85.7)	0.04
>35 years	08 (27.5)	21(72.4)	0.00

DISCUSSION

This research was done to determine the frequency of pre-eclampsia in expecting mothers and its association with the advanced maternal age in tertiary care facilities. Pre-eclampsia in the study population was observed in 32 (12.3%) of the patients in the present research. It was discovered in 21%% of patients having aged <20 years, in 9.0% of patients having age 20- = 25 years, in 5.4% patients having age >30-=30 years, in 14.2% patients having age >30- =35 years. Highest frequency (27.5%) was found in patients having age >35 years.

A substantial correlation between advanced maternal age and pre-eclampsia was found in a study by Soormo et al. They noted pre-eclampsia in 3.1% of patients under 20 years of age, patients between the ages of 20 and 29 made up 4.9%, while those between the ages of 30 and 34 made up 6.9%, and 9.3% of patients above the age of 35. Pre-eclampsia occurred in 5.6% of cases overall.[15]

While a research by Casteleiro et al. found no conclusive evidence linking age to pre-eclampsia. Pre-eclampsia was reported in 0.5% of patients under 24 years old, 1.0% of patients between 24 and 27 years old, 2.0% of patients between 28 and 34 years old, and 2.1% of patients over 35 years old. Preeclampsia affected 1.8% of the population as a whole.[16]

Women with age more than 35 years had a 1.5 times increased chance of having preeclampsia compared to those between the ages of 25 and 29 years.[4] Another Japanese study discovered that women with the age of 45 years and more were having 1.86 and 2.03 times greater likelihood of pre-eclampsia and sever pre-eclampsia.[17]

Preeclampsia was more common than the global average in the current study, which is about 3-8%.[4] Prevalence of preeclampsia was found to be 0.2-6.7% in Asia, 0.5-2.3% in Africa, 2.8-5.2% in Europe, 2.8-9.2% in Oceania, 1.8-7.7% in South America and the Caribbean, and 2.6-4.0% in North America, according to an analysis of bigger data sets.[18]

Preeclampsia prevalence in the Asian areas was reported in another analysis to be 2.07% in China, 1.19% in Japan, 2.22% in Thailand, and 0.59% in Nepal.[19]

Preeclampsia is more common in pregnant Pakistani women from other nations for a number of reasons. A possible underlying cause for the increased occurrence of preeclampsia, for instance, could be that a significant majority of the study participants were pregnant women in their third trimester. Furthermore, Pakistan is a developing nation where the general public, especially those living in rural areas, has lower health concerns. In addition, socioeconomic status and failing to seek treatment in a timely manner may both contribute to the increased frequency of preeclampsia among the expecting mothers in Pakistan.

In this research, a substantial relationship between preeclampsia and maternal age was discovered. In comparison to respondents who were older than or equal to 35, those who were less than or equal to 24 had a lower likelihood of having preeclampsia. This is consistent with research done in Germany,[20] Pakistan[21], and Iran.[22] This may be taken into account by the fact that as people get older, their arteries expand and clog, putting them at risk for devastating consequences like heart attacks or strokes. The body's capacity to handle dietary salt decreases as we get older, which leads to poor diet, inactivity, and diminished blood vessel flexibility, which ultimately leads to hypertension in these women.[23]

Limitations of the Study

Although the prevalence of preeclampsia was assessed in this research and a significant association has been found with advanced maternal age. The study did, however, have certain shortcomings. The study had a small sample size and was only carried out in one hospital, the findings may not be representative of entire population and leading to limited generalizability.

CONCLUSION

The results of the current study indicate that pre-eclampsia affects pregnant women quite frequently and that advance maternal age is a risk factor for the disease.

Future Recommendations

Therefore, in order to meet the high-risk demands of patients with pre-eclmapsia, we advise that proper screening and management of these high-risk individuals be carried out. For patients with pre-eclampsia and advanced maternal age, it is crucial to prioritize regular prenatal care and closely monitor both the mother and baby throughout the pregnancy. In order to lower neonatal morbidity and mortality, it is also important to organize public awareness campaigns and educate the general public on the proper screening for and treatment of pre-eclampsia in pregnant women with advanced maternal age.

Ethical Consideration

This study was approved by the ethical review board of Fauji Foundation Hospital, Rawalpindi, Pakistan.

Funding

There is no role of any funding agency in this study.

Conflict of Interest

Authors declared no conflict of interest

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DATA SHARING STATEMENT: The data that support the findings of this study are available on request from the corresponding author. The data is not publicly available due to privacy or ethical restrictions.

AUTHORS' CONTRIBUTION

The following authors fullfill authorship criteria as per ICMJE guidelines;

Naeem Z, Gul S:	Substantial contribution to conception and design, drafting the manuscript, final approval, agreed to be accountable for all the work.
Masud A, Abrar F:	Substantial contribution to conception and design, data acquisition, drafting the manuscript, final approval, agreed to be accountable for all the work.
Dureshahwar:	Analysis and interpretation of data, drafting the manuscript, final approval, agreed to be accountable for all the work.
Tahir Z:	Analysis and interpretation of data, critical revision,final approval, agreed to be accountable for all the work.

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