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Research Paper

Relationship between types of ABO blood groups and Rh group with Hypertensive disorder among pregnant women in Bani Suef, Egypt

Nursing

KEYWORDS : Blood group, Hypertension, Pregnancy, women Rh

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ABSTRACT

Hypertension is one of the most common medical problem encountered in pregnancy and is a major cause of maternal, fetal and neonatal morbidity and mortality in both developing and developed countries since ABO blood groups are known to be associated with various pathological conditions. The Aim of this study was to examine the possible relation between types of ABO blood groups and Rh group with Hypertensive Disorders among pregnant women in Bani Suef, Egypt. Subject and Methods: A cross-sectional descriptive study; was conducted in a purposive sample of 380 pregnant women. Data collected through a semi-structured interview and field note that the researchers were taking during participants' and observation at 2 days a week for six months in antenatal clinic at Bani Suef University hospital. .Result: the result of this research showed that the most of the study sample age less than 20 year and more than half of them (56%) hypertensive .Conclusion: This study reveals that there is relation between ABO and hypertension and no relation between Rh and hypertension especially with B group during pregnancy. Recommendation: Guide lines for pregnant women regarding the relation between types of ABO blood group, Rh group and hypertension during pregnancy.

Introduction:

The hypertensive disorders of pregnancy are the leading cause of maternal and perinatal mortality and morbidity internationally ***(WHO 2011 & Mishra and Pradhan 2013)*** . Moreover Hypertension complicates approximately 10% of all pregnancies worldwide, and pre-eclampsia and eclampsia are major causes of maternal and perinatal morbidity and mortality ***(Palacios and Pena-Rosas, 2011).*** Also, pregnancy induced hypertension (PIH) is a multifactorial pregnancy- specific syndrome affecting 5-15% of pregnant women. The exact cause is not known, thought to be multifactorial. ABO blood groups are known to be associated with many disorders in this study we try to find out its association with PIH ***(Leife 2011).***

Everyday around 800 women die from preventable causes related to pregnancy and childbirth. Maternal deaths occur as a result of complications during and following pregnancy and childbirth, most develop during pregnancy. Other complications prior to pregnancy are worsened during it. Major complications (around 75%) of maternal deaths include severe bleeding (mostly bleeding after childbirth), infections (usually after childbirth), and high blood pressure during pregnancy, and complications from delivery unsafe abortion ***(WHO, 2014).***

PIH is defined as hypertension (blood pressure ≥ 140/90 mmHg) with or without proteinuria (≥ 300 mg/24 hours) that emerges after 20 weeks gestation, but resolves up to 12 weeks postpartum. It is also defined as new onset proteinuria (≥ 300 mg/24 hours) in hypertensive women exhibiting no proteinuria before 20 weeks gestation ***(Pillitteri, 2014).*** Risk factors with PIH development include previous history of PIH, preexisting diabetes multiple pregnancy, null parity, previous raised blood pressure and raised body mass index before pregnancy ***(Reshmarani, etal ., 2014).***

Blood group antigens are not only important in relation to blood transfusion and organ transplantation, but also have been utilised in genetic research, anthropology and training ancestral relation of humans. **(Khan M, Ahmed Z,et al, 2010)** Keeping this in view, the present study was designed to see frequency (%) of blood group type among hypertensive pregnant women in our population attending antenatal clinic, and to assess the relationship.

In view of the blood group is a risk factor for PIH, the suggested mechanism is that the inherited thrombophilias may increase risk for PIH. Increased plasma concentrations of coagulation factors may result in prothrombotic effect, triggering or exacerbating the pathophysiologic events that results to preeclampsia ***(Lee, etal ., 2012).***

Pregnancy induced hypertension (PIH) is the most frequent complication in pregnancy after the 20th week of gestation. This form of hypertension is classified as preeclampsia and gestational hypertension (GH). PE develops in 4-5% of human pregnancies. The condition of PE is the main cause of maternal and perinatal mortality, low birth weight, and intrauterine growth restriction. It is characterized by an elevated blood pressure and proteinuria that develops after 20 weeks of gestational age. The cause of preeclampsia is still unknown. A completely satisfactory, unifying hypothesis has not emerged. It is likely that there may be several etiologies or underlying predispositions with effects that result in preeclampsia ***(Mahmoud , 2012)***

Preeclampsia, a syndrome unique to human pregnancy and one of the leading causes of maternal and foetal morbidity and mortality, is also associated with maternal blood group. AB blood group patients have increased risk of severe, early-onset or intrauterine growth restriction (IUGR) associated forms of Preeclampsia (***Phaloprakarn &Tangjitgamol 2013 and Reshmarani et al 2014).***

SIGNIFICANCE of THE STUDY

The hypertensive disorders of pregnancy are the leading cause of maternal and perinatal mortality and morbidity internationally .Preeclampsia is a severe complication of human pregnancy with overall incidence of 2–10%. Moreover the findings from this study would help formulate health education strategies on pregnancy induced hypertension in order to reduce the incidence of maternal mortality and morbidity. Also, it may be used in the province to create awareness among health workers on the dan-

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gers posed by pregnant induced hypertension.

Significance to Nursing
Health workers in general and midwives in particular would use this knowledge to educate pregnant women and their significant others on pregnancy-induced hypertension in relation to ABO group so that self-care practices are enhanced. Pregnant mothers who are at risk should be assisted to gain knowledge and skills on pregnancy-induced hypertension and hypertension control. Other researchers may use this study to further their studies. The maternal mortality ratio in developing countries in 2015 is 239 per 100 000 live births versus 12 per 100 000 live births in developed countries. There are large disparities between countries, but also within countries, and between women with high and low income and those women living in rural versus urban areas. Pregnant mothers themselves would benefit from the study as they would use knowledge to look after themselves through recommended diet, prescribed medication, rest and symptoms management practices.

AIM of THE STUDY
The present study was aiming t**o identify the association between blood group and hypertension among pregnant Women in Bani Suef City**

Research Question
Are their association between blood group and hypertension during pregnancy?

SUBJECTS AND METHODS
A Descriptive research design was utilized in this study; it was portrayed under the four main designs as follows.

1- Technical Design.
2- Operational Design.
3- Administrative design.
4- Statistical Design.

Research design
A descriptive study was used.
(1)Technical Design:
The technical designs for this study included research setting, subjects, tools and methods of data collection.

A-Study Setting:
This study was conducted antenatal outpatient clinic of Bani Suef General Hospital

Sample:-
Type of sample: Purposive sample
Sample size: the study sample were 380 pregnant women.

Sample technique: One tenth of annual flow rate at outpatient clinic in the period started from January 2013 till the end of September 2013 of hypertensive pregnant women in previous settings throughout six months they were 3800 women.

Inclusion criteria:
1.Pregnant women whose regular attendant to antenatal clinic.
2.Pregnant women diagnosed for hypertensive disorders during pregnancy

Exclusion criteria:
- Pregnant women having chronic disease (chronic hypertension, D.M , Renal disease,.....)
- All pregnant women having other medical , surgical complication or having history of any drug use, multi-fetal pregnancy and smoking,

C-Tools for Data Collection:
Structured interviewing questionnaire sheet developed by researchers , which include three parts for data collection as the following:-

The first part was related to maternal demographics (age, level of education, employment and ,income.....ect)), the second part included (Obstetrics and gynecological history as(gravidity, parity,) the third part included questions about type of blood group, RH and blood pressure measurement.

Ethical Consideration:
Permission was obtained from the director of Bani Suef General Hospital. Informed consent was obtained from women on participation in the study, explanation of the purpose and importance of the study before interviews were conducted. Use of numbers ensured confidentiality and no names appeared anywhere on the questionnaires. The nature of the study was harmless.

(2)-Operational Design:
The operational design included preparatory phase, content validity, reliability, pilot study and fieldwork.

A-Preparatory Phase:
It included reviewing of literature, different studies and theoretical knowledge of various aspects of the problems using books, articles, internet, periodicals and magazines.

B- Content Validity & Reliability:
The validity of the questionnaire was measured by using views of several experts and its reliability was done through:

Pilot Study:
Pilot study conducted on 10 % of total sample. It involved 38 women to evaluate; the efficiency and clarity and the time needed to complete Structured interviewing questionnaire sheet and find the possible obstacles and problems that might face the researcher and interfere with data collection. The subjects who included in the pilot were excluded from the study.

3) Field work:
(1) The process of data collection was carried out from the start of June 2014 till the end of December 2014 two days per week. The researcher attended at gynecological outpatient clinic form 9.00 a.m to12 p.m.
(2) Each educated woman was individually filling the first and second parts of questionnaire by herself; and the researcher filling the third part of questionnaire which includes (type of blood group, RH and blood pressure measurement
(3) During assessment the researcher measures blood pressure, proteinuria, ABO type and Rh for pregnant women, purpose of the study was explained prior to get the questionnaire sheet, questionnaire distributed to be answered within (20-30 minutes).
(4) The questionnaire was filling from about 3- 5 women per day.

Administrative design: Written letter clarifying the purpose and setting of the study were submitted from the researcher to the director of Bani Suef General Hospital to seek his approval for carrying out the study.

Limitation of the study:
One limitation of this study was lack of recording type of ABO for some women. Another Limitation was lack of women's awareness regarding types of ABO and hypertension.

Statistical analysis:
Data analysis:
Data was collected and entered into a database file. Statistical

analysis was performed by using the SPSS for windows (version 11.5). Data was described by summary tables and figures; Chi-2 test was used. Statistical significance was considered at P-value <0.05 and highly significance at P-value < 0.00.

Descriptive statistics:
-Numbers and percentages:
Used for describing and summarizing qualitative data.

- The following statistical meas ures for significant relation were used:
Chi square(X2): Used to test the association between two qualitative variables or compared between two or more proportion.

Results:-
Figure (1): Distribution of the study sample according to types of ABO Blood grouping. This figure shows that more than half of the study sample (51.3%) have B blood group , 25.5% O, 20.3% AB, and 2.9% A respectively.

Table (1): Relation between age groups and hypertensive disorders during pregnancy. This table shows that relation between age groups and hypertensive disorders during pregnancy. More than half of the study sample whose diagnosed with gestational Hypertension were at age group 20-<25 and 54.8% of the study sample diagnosed with Pre-eclampsia at age group <20. Also, statistically significant difference was found between age groups and hypertensive disorders during pregnancy

Figure (2): Relation between numbers of gravidity and hypertensive disorders during pregnancy. This table demonstrates the Relation between numbers of gravidity and hypertensive disorders during pregnancy. The majority of the study sample were multipara 85.4% of them pre-eclampsia and 79.4% gestational Hypertension. Statistically significant difference was found between numbers of gravidity and hypertensive disorders during pregnancy

Table (3): Relation between type of BL. Group and hypertensive disorders during pregnancy. This table reveales that the most of group B (71.5%) were pre-eclamptic , followed by group O (44.8%) were diagnosed for gestational hypertension. Although, in this table statistically significant difference was found between ABO and hypertension disorder during pregnancy and group B in pregnant women was more susceptible to hypertension and followed by group O.

Table (4): Relation between type of Rh and hypertensive disorders during pregnancy. This table reveales that gestational hypertension and Pre-eclampsia were found in positive Rh (83.4%) and only 16.6% of the study sample in negative Rh. Statistically significant difference was found between type of Rh and hypertensive disorders during pregnancy

Figure (1): Distribution of the study sample according to types of ABO Blood grouping.

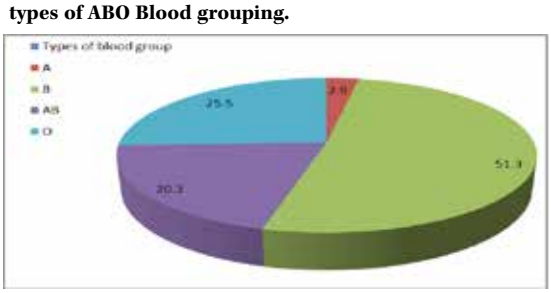

Table (1): Relation between age groups and hypertensive dis orders during pregnancy

Age	Gestational Hypertension		Pre-eclampsia		Total	
<20	6	5%	131	54.8%	137	36.1%
20-<25	84	59.6 %	27	11.3 %	111	29.2%
25-<30	49	34.8%	23	9.6%	72	18.9%
30-<35	2	1.4 %	58	24.3%	60	15.8%
Total	141	100 %	239	100%	380	100 %

X^2 =201.6 ***P < 0.05****

Figure (2): Relation between numbers of gravidity and hypertensive disorders during pregnancy.

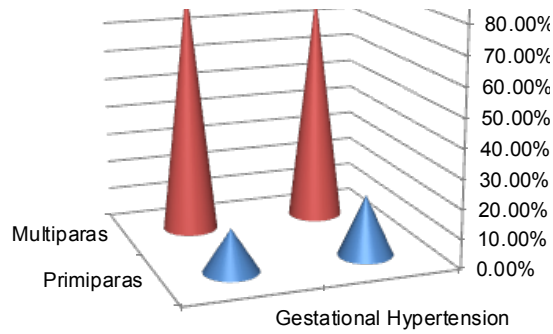

Table (3): Relation between type of BL. Group and hypertensive disorders during pregnancy

Type of Bl. group	Gestational Hypertension		Pre-eclampsia		Total	
	No	%	No	%	No	%
A	10	7.0%	1	0.4%	11	2.9%
B	24	17.0%	171	71.5%	195	51.3%
AB	44	31.2 %	33	13.8%	77	20.3%
O	63	44.8%	34	14.2%	97	25.5%
Total	141	37.1%	239	62.9%	380	100.0%

X^2 =124.4 P= 0.001 P < 0.05*

Table (3): Relation between type of Rh and hypertensive disorders during pregnancy

Type of Rh.	Gestational Hypertension NO %		Pre-eclampsia NO %		Total NO %	
Negative	16	11.3%	47	19.7%	63	16.6%
Positive	125	88.7%	192	80.3%	317	83.4%
Total	141	100%	239	100.0%	380	100.0%

X^2 =9.72 P < 0.05*

DISCUSSION
Pregnancy-induced hypertension (PIH), which includes both gestational hypertension and preeclampsia, is a common and morbid pregnancy complication for which the pathogenesis remains unclear. The results of our study indicate that that more than half of the study sample (51.3%) have B blood group , 25.5% O, 20.3% AB ,and 2.9% A respectively. ***Mishra and Pradhan (2013)*** whose study on total 4953 demonstrate that samples blood group O represent 38 % , A,B &AB represent 23%, 32% &7% respectively.

In our study pregnant women with blood group B have the highest risk for PIH compared to other blood group**.** Although we found that statistically significant difference was found between types ABO and hypertension disorder during pregnancy. However, the prevalence of gestational hypertension are maximum with O blood groups whereas incidence of preeclampsia is highest seen in B type individuals. Whereas women with A blood group have the lowest risks. Our study result disagree with

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similar study done by (***Reshmarani et al 2014***) who found that hypertensive disorders of pregnancy in A blood groups but in the line of the same study regarding gestational hypertension. In addition, **Rwitusmita Bharali et.al 2014 ,** their study indicated that AB blood group had the highest risk of developing PIH and the risk increases as the severity of PIH increases. On the other hand ***Mishra and Pradhan (2013)*** found that A blood type is significantly associated with hypertensive disorders of pregnancy; how-ever, the incidence of Gestational hypertension are maxi-mum with O blood groups whereas incidence of preeclampsia and eclampsia are highest seen in A type individuals. But the role of blood groups in hypertensive disorders of pregnancy cannot be concluded without a proper investigation of paternal blood group and its association.

In our opinion this may be related the different of genetic factors, race and living environment. Knowing the risk of specific type blood groups with hypertensive disorders may be clinically useful because it may play preventive and curative role in maternal and neonatal prognosis as well as pregnancy management.

Preeclampsia, a syndrome unique to human pregnancy and one of the leading causes of maternal and fetal morbidity and mortality, is also associated with maternal blood group. AB blood group patients have increased risk of severe, early-onset or intrauterine growth restriction (IUGR) associated forms of preeclampsia ***(Than etal., 2011)***.

Regarding RH the results of our study which was indicate that, the majority of the study sample (83.4%) have positive RH and were diagnosed for gestational Hypertension and pre-eclampsia . Our study result disagree with similar study by ***Lee etal .,2012*** ,they found that Rh-positive mothers had a small increased risk for pre-eclampsia. The Rh factor assumes a special importance in maternal-fetal interactions. A mother who is Rh- can bear an Rh+ child if the father is Rh+ (either homozygous or heterozygous). Since there are no natural anti-Rh antibodies, this generally poses no special risk for the first pregnancy. At the time of birth, however, tissue damage resulting from the separation of the placenta from the uterine wall can result in a significant amount of fetal blood entering the maternal circulation; which may stimulate a *strong IgG anti-Rh response* in the mother. Also, when a mother and her unborn baby carry different Rh protein factors, their condition is called Rh incompatibility. It is specifically caused when a mother is Rh-negative and her baby is Rh-positive.

Sometimes chronic hypertension or gestational hypertension leads to preeclampsia, a pregnancy complication characterized by high blood pressure and signs of damage to another organ system usually after 20 weeks of pregnancy. Left untreated, preeclampsia can lead to serious even fatal complications for mother and baby. Previously, preeclampsia was only diagnosed if a pregnant woman had high blood pressure and protein in her urine. However, experts now know that it's possible to have preeclampsia, yet never have protein in the urine. So, we need similar study to determine and early detection for hypertensive disorders during pregnancy and early treatment to prevent compactions for the mother and fetuses.

Conclusion and recommendation

Our study shows an association between ABO blood group and occurrence of PIH, with B blood group women having highest risk. Thus special attention should be given to pregnant women carrying the B, AB and O blood group in order to prevent the development of PIH and improve prognosis. **The results of this study suggest there is** association between types of ABO groups and RH with hypertensive disorders during pregnancy

Recommendations:

Based on the finding of the present study, the following recommendations are suggested that:

Enhancing women awareness regarding the association between types of ABO. Groups and hypertensive disorders during pregnancy.

Enhancing maternal nurse's awareness regarding the association between types of ABO. Groups and hypertensive disorders during pregnancy

Future study:

Similar study on large sample needed and study other factors leading to hypertensive disorders during pregnancy and it is association with types of ABO groups.

References*:*

1. **Lee, B., Zhang, Z., Wikman, A., Lindqvist, P. and Reilly, M. (2012),** ABO and RhD blood groups and gestational hypertensive disorders: a population-based cohort study. BJOG: An International Journal of Obstetrics & Gynaecology, 119: 1232–1237.
2. **Leifer G (2011):** Introduction to maternity & pediatric Nursing 6th ed, Elsesvier ,ST, Louis, United states of American.Htt://evolve, , Elsesvier.com/ leifer , PP90-92.
3. **Mahmoud AM., (2012):** Relationship between maternal serum high sensitive C-Reactive protein level with body mass index and severity of pre-eclampsia in third trimester, non-published thesis submitted to faculty of medicine in partial fulfillment of the requirement of master degree in obstetrics and gynecology medicine, Suez canal university pp 1-2.
4. **Mishra S. and Pradhan P. (2013):** Association Of Maternal ABO Blood Group And Hypertensive Disorders Of Pregnancy , International Journal of Innovative Research in Technology & Science(IJIRTS), VOLUME (3), NUMBER
5. **Palacios C, Pena-Rosas JP. (2011) :** Calcium supplementation during pregnancy for preventing hypertensive disorders and related problems : RHL commentary (last revised: 1 July 2011). The WHO Reproductive Health Library; Geneva: World Health Organization**.**
6. **Phaloprakarn C, Tangjitgamol S; (2013):** Maternal ABO blood group and adverse pregnancy outcomes. Journal of Perinatology; 33(2): 107-111
7. **Pilliteri A ,(2014):** maternal 7 child health nursing ,7th ed , lippinicott Williams, philadephia 573-575.
8. **Reshmarani , Veena H. C , Bennal A (2014):** Association between ABO Blood Group and Pregnancy Induced Hypertension, Sch. J. App. Med. Sci., 2014; 2(6C):3054-3056 .
9. **Rwitusmita B.,Wasima J., Horshajyoti C., and Pranjal B. (2014):** ABO blood group - a risk factor for pregnancy induced hypertension Rwitusmita Bharali, Int J Biol Med Res. 2014; 5(1): 3797-3801, Journal homepage: www.biomedscidirect.com .
10. **Than NG., Romero R., Meiri H., Erez O ., Xu Y., and Tarquini F .(2011):** Maternal ABO blood groups and the risk assessment of pregnancy complications. PP13, 2011; 6(7):
11. **WHO (2011):** recommendations for prevention and treatment of pre-eclampsia and eclampsia. Geneva: World Health Organization.
12. **World Health Organization**; Maternal mortality. Fact sheet N°348, May 2014. Available from http://www.who.int/mediacentre/factsheets/fs348/en.
13. **Khan M, Ahmed Z, Hanif R, Zaman S, Ali I, Rahman J, Zaman F (2010):** RELATIONSHIP BETWEEN BLOOD GROUPS AND MALE INFERTILITY, J Ayub Med Coll Abbottabad 2010;22(1) http://www.ayubmed.edu.pk/JAMC/PAST/154 22-1/Zahoor.pdf