FREQUENCY OF DYSLIPIDIMIA IN PREGNANT WOMEN WITH PRE ECLAMPSIA IN SERVICES HOSPITAL LAHORE

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Abstract:
Background: *Pre-eclampsia is one of the most common complications of pregnancy. Obesity is an independent risk factor of preeclampsia. It is well documented that preeclampsia women had deranged lipid profile as compared to normal pregnant women. So we conducted this study.*
Objective: *To determine the frequency of dyslipidemia in pregnant women with pre-eclampsia*
Material & Methods: Study Design: *It was descriptive cross sectional study*
Setting: *Mian Maula Bakhsh, DHQ Teaching Hospital, Sargodha*
Duration: *6 months after the approval of synopsis i.e. from 6th may 2016 to 6th November 2016.*
Data collection: *Blood sample in a disposable syringe were taken with the help of paramedical staff after 3 hours of fasting overnight and sent to hospital laboratory for evaluation of lipid profile. All the collected data was entered and analyzed on SPSS version 18.*
Results: *The mean age of the patients was 28.91±6.57 years. The mean BMI of the patients was 26.51±4.82 kg/m2. Dyslipidemia was present in 82(54.67%) patients*
Conclusion: *The frequency of dyslipidemia in pregnant women with pre-eclampsia was high.*
Keywords: *Preeclampsia, Dyslipidemia, Pregnant, Women*

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INTRODUCTION:

Pre-eclampsia & eclampsia is one of the most common complications of pregnancy. In India the incidence of Pre-eclampsia is reported to be 8-10% of pregnancy. It is a cause of high morbidity for both mother & fetus, especially in developing counties.1 The prevalence of pre-eclampsia and eclampsia is around 19% in Pakistan. Maternal mortality is extremely high in Pakistan where 1 in 89 women die of maternal causes with pre-eclampsia and eclampsia being major causes.2

Key features of the preeclampsia category include a cut-off BP≥140/90mmHg and absolute requirement of proteinuria. Abnormal placentation related to immune mechanisms and maladaptation of the placenta may be the first step in the etiology and development preeclampsia. It is obvious that a single mechanism responsible for the syndrome preeclampsia does not exist. Instead, several mechanisms can act together and even multiply each other.3 Obesity is an independent risk factor of preeclampsia with unknown mechanism and hyperlipidemia might be a probable cause of it.4

It is well documented that preeclampsia women had deranged lipid profile as compared to normal pregnant women.5 Various studies 1,6,7 recorded hyperlipidemia in pre-eclampsia cases but these findings were recorded as mean serum triglycerides, TC, HDL-C and LDL-C but no recent study was found showing the frequency of dyslipidemia in cases with pre-eclampsia.

A seven years old local study 6 revealed that > 108 LDL levels 88.9% of the cases developed pre-eclampsia, >40HDL levels 39.7% of the cases had pre-eclampsia, >175 triglycerides levels had 84.1% pre-eclampsia. One study, conducted in Iran showed that the frequency of dyslipidemia (tc > 200 mg/dl) was in 58.5% females who initialy presented with preeclampsia (n=42).4 Findings reflect the association of dyslipidemia with pre-eclampsia.

The rationale of the study is that no recent local and international study is conducted to determine the frequency of dyslipidemia in pregnant women with pre-eclampsia, which needs to record these findings so that the morbidity may be recorded in terms of frequency and percentage which will be helpful to clarify the frequency of the morbidity. This will also help the obstetricians and pregnant women as well.

LITERATURE REVIEW:
Pre-eclampsia

Pre-eclampsia is a disorder of pregnancy characterized by the onset of high BP and often a significant amount of protein in the urine. The condition begins after 20 weeks of pregnancy. In severe disease there may be red blood cell breakdown, a low blood platelet count, impaired liver function, kidney dysfunction, swelling, shortness of breath due to fluid in the lungs, or visual disturbances. Pre-eclampsia increases the risk of poor outcomes for both the mother and the baby. If left untreated, it may result in seizures at which point it is known as eclampsia.7-10

Risk factors for pre-eclampsia include obesity, prior hypertension, older age, and diabetes mellitus. It is also more frequent in a woman's first pregnancy and if she is carrying twins. The underlying mechanism involves abnormal formation of blood vessels in the placenta amongst other factors. Most cases are diagnosed before delivery. Rarely, pre-eclampsia may begin in the period after delivery. While historically both high BP and protein in the urine were required to make the diagnosis, some definitions also include those with hypertension and any associated organ dysfunction. BP is defined as high when it is greater than 140 mmHg systolic or 90 mmHg diastolic at two separate times, more than four hours apart in a woman after twenty weeks of pregnancy. Pre-eclampsia is routinely screened for during prenatal care.7, 9, 11, 12

Recommendations for prevention include: aspirin in those at high risk, calcium supplementation in areas with low intake, and treatment of prior hypertension with medications. In those with pre-eclampsia delivery of the baby and placenta is an effective treatment. When delivery becomes recommended depends on how severe the pre-eclampsia and how far along in pregnancy a person is. BP medication, such as labetalol and methyldopa, may be used to improve the mother's condition before delivery. Magnesium sulfate may be used to prevent eclampsia in those with severe disease. Bedrest and salt intake have not been found to be useful for either treatment or prevention.13, 14

Pre-eclampsia affects 2–8% of pregnancies worldwide. Hypertensive disorders of pregnancy (which include pre-eclampsia) are one of the most common causes of death due to pregnancy. They resulted in 46,900 deaths in 2015. Pre-eclampsia usually occurs after 32 weeks; however, if it occurs earlier it is associated with worse outcomes. Women who have had pre-eclampsia are at increased risk of heart disease and stroke later in life. The word eclampsia is from the Greek term for lightning. The first known description of the condition was by Hippocrates in the 5th century BC.11, 12, 14-16
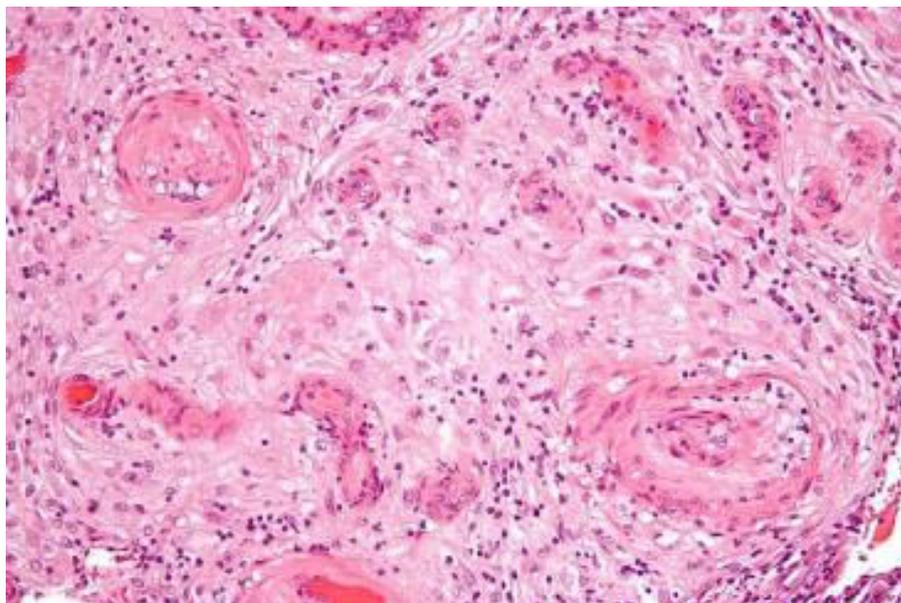
Fig i: A micrograph showing hypertrophic decidual vasculopathy, a finding seen in gestational hypertension and pre-eclampsia. H&E stain10

History of Pre-eclampsia

The word eclampsia is from the Greek term for lightning. The first known description of the condition was by Hippocrates in the 5th century BC.17

An outdated medical term for pre-eclampsia is toxemia of pregnancy, a term that originated in the mistaken belief that the condition was caused by toxins.10

Epidemiology of Pre-eclampsia

Pre-eclampsia affects approximately 2–8% of all pregnancies worldwide. The incidence of pre-eclampsia has risen in the USA since the 1990s, possibly as a result of increased prevalence of predisposing disorders, such as chronic hypertension, diabetes, and obesity.7, 8, 12, 18

Pre-eclampsia is one of the leading causes of maternal and perinatal morbidity and mortality worldwide. Nearly one-tenth of all maternal deaths in Africa and Asia and one-quarter in Latin America are associated with hypertensive diseases in pregnancy, a category that encompasses pre-eclampsia.10

Pre-eclampsia is much more common in women who are pregnant for the first time.19 Women who have previously been diagnosed with pre-eclampsia are also more likely to experience preeclampsia in subsequent pregnancies.14 Pre-eclampsia is also more common in women who have preexisting hypertension, obesity, diabetes, autoimmune diseases such as lupus, various inherited thrombophilias such as Factor V Leiden, renal disease, multiple gestation (twins or multiple birth), and advanced maternal age.14 Women who live at high altitude are also more likely to experience pre-eclampsia.20 Preeclampsia is also more common in

some ethnic groups (e.g. African-Americans, Sub-Saharan Africans, Latin Americans, African Caribbeans, and Filipinos). Change of paternity in a subsequent pregnancy has been implicated as affecting risk, except in those with a family history of hypertensive pregnancy12, 21, 22.

MATERIALS AND METHODS:

Setting:
The study was conducted at Maula Bakhsh DHQ Teaching Hospital Sargodha.

Study design:
Descriptive (cross-sectional survey)

Study duration:
Six months after approval of synopsis.

Sampling technique:
Non-probability: Consecutive Technique

Sample size:
Sample size of 150 cases was calculated with 95% confidence level 8% margin of error and taking expected %age of dyslipidemia in pregnant women with pre-eclampsia as 58.5%.4

Sample selection:

Inclusion criteria:
- All diagnosed cases of pre-eclampsia (according to operational definition)
- Age 18-40 years with any parity <5. Gestaional age >28weels

Exclusion Criteria
- Already diagnosed cases of dyslipidemia and under treatment of it (on history and medical record)
- Twin gestation (on USG)
- Not willing to participate in the study

Data collection procedure:

A total of 150 cases fulfilling the inclusion / exclusion criteria were enrolled from Obstetrics and Gynaecology, Maula Bakhsh DHQ Teaching Hospital, Sargodha. An informed consent of the patients was taken from the patients to include their data in the study. Complete history and physical examination was done. Blood sample In a disposable syringe was taken with the help of paramedical staff after 3 hours of fasting overnight and sent to hospital laboratory for evaluation of lipid profile i.e. Triglycerides (TG), total cholesterol (TC), low density lipoprotein (LDL) and high Density Lipoprotein (HDL) for subjects. Dyslipidemia (according to operational definition was recorded by the researcher herself on a pre-designed proforma. All patients of pre-eclampsia and dyslipidemia managed as per standard protocols.

Statistical analysis:
The data was entered and analyzed in SPSS version 18.0. Mean and Standard deviation was calculated for quantitative variable like age, gestational age and lipid profile (i.e. TG, TC, LDL, HDL levels). Frequencies and percentages were calculated for qualitative variables like dyslipidemia in pregnant women with pre-eclampsia. Stratification for age, gestational age, parity and BMI was done to address the effect modifiers. Post stratification chi-square test was applied to see the significance. p-value <0.05 was considered as significant. Parity was presented as frequency.

RESULTS:
In this present study total 150 patients were enrolled. The mean age of the patients was 28.91±6.57 years with minimum and maximum ages of 18 & 40 years respectively. **Table#1**

In our study 44(29.33%) patients were with no parity, 43(28.67%) patients were with parity one, 38(25.33%) patients were with parity two, 20(13.33%) patients were with parity three and 5(3.33%) patients were with parity four. **Fig#1**
Out of 150 patients the mean gestational age was 32.27±2.19 weeks with minimum and maximum gestational ages of 29 & 36 weeks respectively. **Table#2**

Out of 150 patients the mean BMI of the patients was 26.51±4.82 kg/m2 with minimum and maximum BMI values of 18.50 & 34.81 kg/m2 respectively. **Table#3**

Out of 150 patients the mean TG of the patients was 147.73±427.374 with minimum and maximum TG values of 100 & 198 respectively. **Table#4**
In our study the mean cholesterol of the patients was 229.99±45.190 with minimum and maximum cholesterol values of 128 & 300 respectively. **Table#5**

In our study the mean LDL of the patients was 103.69±43.97 with minimum and maximum LDL values of 50 & 198 respectively. **Table#6**
In this study the mean HDL of the patients was 39.17±9.62 with minimum and maximum HDL values of 25 & 60 respectively. **Table#7**
In this study the dyslipidemia was present in 82(54.67%) patients and it was not found in 68(45.33%) patients. **Fig#2**

The study results showed that in patients with age ≤ 30 years were 85 in which dyslipidemia was present in 46 cases and it was not found in 39 cases, similarly the > 30 years patients were 65 in which dyslipidemia was present in 36 cases and it was not found in 29 cases. Statistically significant difference was found between the dyslipidemia with age i.e. p-value=0.024. **Table#7**
The study results showed that in patients with primary parity were 87 in which dyslipidemia was present in 47 cases and it was not found in 40 cases, similarly the multiparity patients were 63 in which dyslipidemia was present in 35 cases and it was not found in 28 cases. Statistically insignificant difference was found between the dyslipidemia with parity i.e. p-value=0.852. **Table#8**
The study results showed that in patients with gestational age 29-33 weeks were 103 in which dyslipidemia was present in 54 cases and it was not found in 49 cases, similarly patients with gestational age 34-36 weeks were 47 in which dyslipidemia was present in 28 cases and it was not found in 19 cases. Statistically insignificant difference was found between the dyslipidemia with gestational age i.e. p-value=0.415. **Table#9**

The study results showed that in patients with normal BMI were 62 in which dyslipidemia was present in 33 cases and it was not found in 29 cases, similarly patients with abnormal BMI were 88 in which dyslipidemia was present in 49 cases and it was not found in 39 cases. Statistically insignificant difference was found between the dyslipidemia with BMI i.e. p-value=0.766. **Table#10**

Table#1
Descriptive statistics of age (years)

Age (years)	n	150
	Mean	28.91
	SD	6.57
	Minimum	18
	Maximum	40
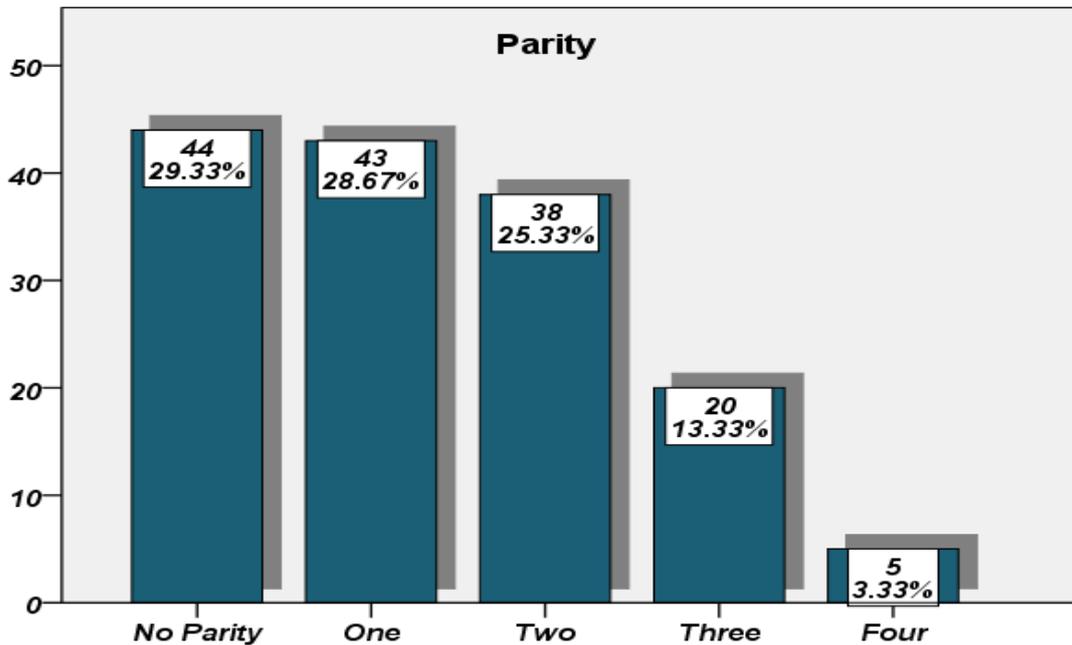
Fig#1: Frequency distribution of parity

Table#2: Descriptive statistics of gestational age (weeks)

Gestational age (weeks)	n	150
	Mean	32.37
	SD	2.19
	Minimum	29
	Maximum	36

Table#3
Descriptive statistics of BMI (kg/m2)

BMI (Kg/m2)	n	150
	Mean	26.51
	SD	4.82
	Minimum	18.50
	Maximum	34.81

Table#4
Descriptive statistics of TG

TG	n	150
	Mean	147.73
	SD	27.374
	Minimum	100
	Maximum	198

Table#5
Descriptive statistics of cholesterol

Cholesterol	n	150
	Mean	229.99
	SD	45.190
	Minimum	128
	Maximum	300

Table#6
Descriptive statistics of LDL

LDL	n	150
	Mean	103.69
	SD	43.97
	Minimum	50
	Maximum	198

Table#7
Descriptive statistics of HDL

HDL	n	150
	Mean	39.17
	SD	9.62
	Minimum	25
	Maximum	60
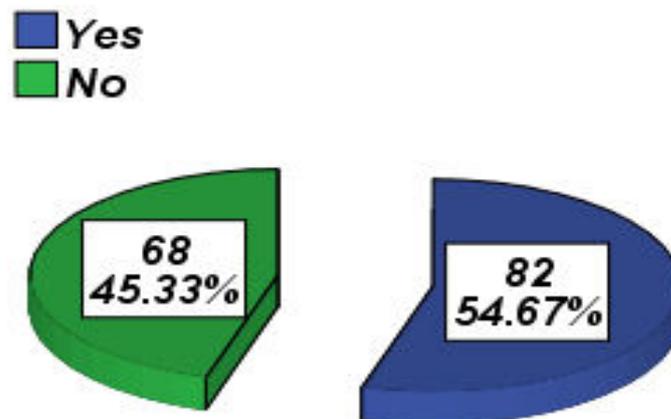
Fig#2
Frequency distribution of dyslipidemia

Table#7
Comparison of dyslipidemia with age

		Dyslipidemia		Total
		Yes	No	
Age (years)	≤ 30	46	39	**85**
	> 30	36	29	**65**
Total		**82**	**68**	**150**

Chi value=0.877
p-value=0.024

Table#8
Comparison of dyslipidemia with parity

		Dyslipidemia		Total
		Yes	No	
Parity	Primary	47	40	87
	Multiple	35	28	63
Total		82	68	150

Chi values=0.035
p-value=0.852

Table#9
Comparison of dyslipidemia with gestational age (weeks)

		Dyslipidemia		Total
		Yes	No	
Gestational age (weeks)	29-33	54	49	103
	34-36	28	19	47
Total		82	68	150

Chi value=0.665
p-value=0.415

Table#10
Comparison of dyslipidemia with BMI

		Dyslipidemia		Total
		Yes	No	
BMI	Normal	33	29	62
	Abnormal	49	39	88
Total		82	68	150

Chi value=0.089
p-value=0.766

DISCUSSION:

This present descriptive cross sectional study was carried out at at Maula Bakhsh DHQ Teaching Hospital Sargodha to determine the frequency of dyslipidemia in pregnant women with pre-eclampsia.

Preeclampsia is a well-defined syndrome, defined by new-onset gestational hypertension and proteinuria occurring in approximately 5-8% of pregnancies and is a major source of maternal and fetal morbidity and mortality. When preeclampsia becomes associated with neurologic deficits, this syndrome is known as eclampsia, and emergent delivery is indicated given exceedingly high maternal and fetal mortality.71. In our study the frequency of dyslipidemia in in pregnant women with pre-eclampsia was 82(54.67%). The mean value of TG of the patients was 147.73±427.374, the mean value of cholesterol of the patients was 229.99±45.190 and the mean value of LDL, HDL was 103.69±43.97 & 39.17±9.62 respectively. Some of the studies are discussed below showing their results as.

A study by IA Siddiqui et al72 presented that the Women with pre-eclampsia exhibited higher serum triglyceride levels compared with normal pregnant women (P < 0.01). Other measured serum lipids did not differ significantly in the two groups. A seven years old local study 6 revealed that > 108 LDL levels 88.9% of the cases developed pre-eclampsia, >40HDL levels 39.7% of the cases had pre-eclampsia, >175 triglycerides levels had 84.1% pre-eclampsia. One study, conducted in Iran showed that the frequency of dyslipidemia (tc > 200 mg/dl) was in 58.5% females who initialy presented with preeclampsia (n=42).4 Findings reflect the association of dyslipidemia with pre-eclampsia. Clausen T et al73 demonstrated that the Hypertrigliceridemic dyslipidemia before 20 weeks of gestation is associated with the risk of developing early but not late onset pre-eclampsia, giving support to the contention that these two variants of the disease are at least partly pathogenically different.

Preeclamptic women tend to have increased levels of Lp(a), of uncertain significance. These gestations are also marked by higher levels of TG, lower levels of HDL-C, and greater fractionation of small dense atherogenic LDL particles. Elevated LDL fractions with lower HDL-C levels appear to be more pronounced in women with gestational hypertension and diabetes, and preeclampsia.66, 69, 74

One study by Tanja G. M. Vrijkotte et al75 resulted that the mean (SD) triglyceride and total cholesterol levels were 1.33 (0.55) and 4.98 (0.87) mmol/liter, respectively. The incidence of pregnancy complications and perinatal outcomes were as follows: PIH, 4.9%; preeclampsia, 3.7%; preterm birth, 5.3%; small for gestational age, 9.3%; large for gestational age, 9.3%; and child loss, 1.4%.

Another study by Seyede Hajar Sharami et al4 concluded that dyslipidemia, particularly hypertriglyceridemia was highly correlated with prepregnancy high BMI in preeclamptic women. These findings continue to support a role for dyslipidemia in BMI related preeclampsia. Numerous studies suggest that a dyslipidemic pattern of increased total cholesterol, triglycerides, and low-density lipoprotein cholesterol (LDL-C), along with decreased high-density lipoprotein cholesterol (HDL-C) concentrations may be associated with an increased risk of preeclampsia, results are inconsistent.76-79. Epidemiologic studies have shown a strong association between dyslipidemia and preeclampsia. Additionally, women who experience preeclampsia are more likely to develop dyslipidemia later-in-life. The most common patterns of dyslipidemia experienced during preeclamptic pregnancies are elevated triglycerides and reduced HDL-C levels.80, 81

CONCLUSION:
According to our study results the frequency of dyslipidemia in pregnant women with pre-eclampsia was 82(54.67%). Now we have got the updated data regarding dyslipidemia in females with preeclampsia. Now in future, if we control dyslipidemia in early stage, preeclampsia can be decreased. This will also help the obstetricians and pregnant women as well.

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