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PREVALENCE OF CARDIAC DISEASES;
DURING PREGNANCY AND ITS FETO-MAINTERNAL OUTCOME

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ABSTRACT… Objectives: The objective of this study was to find the prevalence of cardiac disease among pregnant females and its impact on feto-maternal outcome. **Study Design:** Descriptive case series. **Setting:** Cardiology department Gulab Devi Chest Hospital Lahore **Duration:** April 2013 to April 2014. **Patients & Methods:** All pregnant females with cardiac disease at any gestation with booked or un-booked statutes were included in this study. Patients were admitted for thorough evaluation and investigations. Labor was monitored intensively. Data regarding maternal outcomes were noted down on pre-formed questionnaire. Intra partum and postpartum details were also noted down along with fetal outcome. The results were analyzed using SPSS version 16.0.. **Results:** The total number of females presented with cardiac disease was 2650, out of which only 35 women were reported as pregnant. The duration of pregnancy at the time of presentation was as follows: 05 (14.2%) females presented in first trimester, 20 (57.1%) in second trimester, 08 (22.8%) in third trimester and 02 (5.7%) patients presented in postpartum period. There were 08 (22.8%) patients who had preterm labor. In terms of fetal outcome 04 babies had birth weight of less than 1.5 kg, 12 had 1.5-2.0 kg, 15 were in range of 2-2.5 kg and 04 were more than 2.5 kg. 27 (77.1%) were term and 08 (22.8%) were preterm babies. Cleft lip and atrial septal defect were the only two identified congenital anomalies. **Conclusion:** The overall prevalence of cardiac diseases during pregnancy was found to be 1.3% in this study. Most common affected age group was of 20-25 years. Most common cardiac disease found in our patient was mitral stenosis. 02 pregnancies ended in intrauterine fetal death. 08 babies were born preterm. Cleft lip and atrial septal defect were the only two identified congenital anomalies in newborn delivered by our pregnant patients. Every effort should made to create awareness regarding pre-pregnancy counseling, so that associated fetal and maternal morbidity can be reduced.

Key words: Valvular heart disease, maternal health, Child Health.

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INTRODUCTION

The medical disorders in pregnant females put them in a group of high risk patients. The cardiovascular diseases involve 1-4% of pregnant females.[1] The overall incidence of serious cardiac disease complicating pregnancies is 1% and despite modern and antenatal care it can have adverse effects on maternal and fetal outcomes.[2] The etiology of these diseases differs to some extent to develop and underdeveloped countries.[3]

In underdeveloped countries like ours most females present with valvular heart disease. The increased maternal risk in a female with cardiac disease is due to aggravation of pregnancy related physiological changes in the body.[4] The cardiovascular system in a healthy pregnant female undergoes changes such as increase in total body water, retention of sodium, increase in cardiac output, hyper coagulability and venous stasis especially in the lower limbs due to which serious fetomaternal and cardiac complications during pregnancy and postpartum period can occur.[5] Heart failure, arrhythmias, stroke, pulmonary edema, pulmonary embolism, pulmonary hypertension can occur. These can involve 12-20 % of the patients. Mortality in some conditions can be as high as 30%. The obstetric events such as preterm labor, poor progress in labor, maternal and fetal distress can happen. There are also risks

of fetal growth retardation, problems of prematurity and low birth weight. The risk during pregnancy can be assessed on individual basis. The cardiac status of patient is established according to the New York Heart Association (NYHA) classification. Female is placed in low, intermediate or high risk group. Most of the pregnant patients belong to intermediate and high risk groups.[7,8] The complexity of these patients requires multidisciplinary approach with the involvement of obstetrician, cardiologist, anesthesiologist and neonatologist in a center with high risk obstetrical facilities.[8] The objective of this research was to study feto-maternal outcome of pregnancy with cardiac disease.

MATERIALS AND METHODS

Design and Setting

This descriptive case series was conducted at cardiology department of Gulab Devi Chest Hospital Lahore from April 2013 to April 2014.

Sample Selection

All pregnant females with cardiac disease at any gestation with booked or un-booked statutes were included in this study. Pregnant females with same complaints due to physiological, psychological or other medical disorders were excluded from the study.

PATIENTS AND METHODS

Patients fulfilling criteria were included in the study. Patients were admitted for thorough evaluation and investigations. A detailed history was taken. Regarding clinical examination more emphasis was given on cardiovascular and obstetric examination. Patient's age, obstetric history, gravidity, parity, duration of pregnancy was noted. Presenting complaints were recorded. In collaboration with cardiologist, diagnoses were made and specific management started according to the duration of the pregnancy and cardiac status. Feto-maternal monitoring was done. Any cardiac or obstetric complication noted and managed. Patient was evaluated weekly by cardiologist. Fetal growth was evaluated by serial ultrasonography and biophysical profile. All the patients were investigated by CBC, blood group and Rh factor, blood glucose level, coagulation profile, viral markers for HbsAg and the anti-HCV antibody, obstetric ultrasonography and echo cardiography, ECG, renal and liver function test. D-dimers, X-ray chest, V/Q scan were performed where required. All the information gathered was recorded on a proforma. Intra partum and postpartum details noted and fetal outcome recorded. Fetal assessment regarding growth, SGA, IUGR, preterm babies, low birth weight was done.

STATISTICAL ANALYSES

The results were analyzed using SPSS version 16.0. Categorical data were presented as percentages and in form of graphs while descriptive and frequency distribution was used for quantitative analyses.

RESULTS

The total number of females presented with cardiac disease was 2650, out of which only 35 women were reported as pregnant.

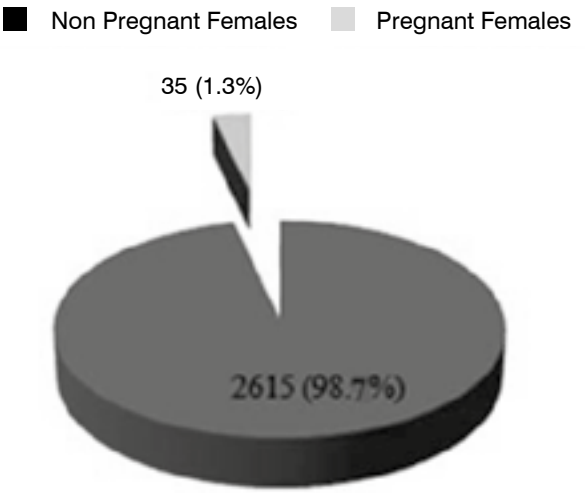

Fig-1. Frequency of pregnant females in patients presented with cardiac disease

The most common age group among the pregnant females was of 20-25 years. 28.5% of the pregnant females were from the age group of 26-30 years and 11.4% of the pregnant females were more than 30 years of age. Regarding gravidity the 11 (31.4%) patients were primigravida, and 24 (68.5%) were multigravida. The duration of pregnancy at the time of presentation was as follows:

05 (14.2%) females presented in first trimester, 20 (57.1%) in second trimester, 08 (22.8%) in third trimester and 02 (5.7%) patients presented in postpartum period.

		Frequency (n = 35)	Percentage
Age	< 20	01	2.8 %
	20-25	20	57.1 %
	25-30	10	28.5 %
	> 30	04	11.4 %
Gravidity	Primi gravida	11	31.4 %
	Multi gravida	24	68.5 %
Duration of Pregnancy	1st Trimester	05	14.2 %
	2nd Trimester	20	57.1 %
	3rd Trimester	08	22.8 %
	Postpartum	02	5.7 %

Table-I. Demographic & Obstetric Characteristics

Table-II shows the frequency of presenting complaint among pregnant females. All of our pregnant patients were presented with the complaint of dyspnea, 20 (57.1%) had chest pain, 15 (42.8%) had palpitation, 18 (51.4%) presented with cough and 02 (5.7%) had hemiparesis.

Presenting Complaints	Frequency (n=35)	Percentage
Dyspnea	35	100 %
Chest Pain	20	57.1 %
Palpitations	15	42.8 %
Cough	18	51.4 %
Hemiparesis	02	5.7 %

Table-II. Presenting complaints

Table-III shows the spectrum of cardiac diseases in our pregnant patients. Out of the total 35 pregnant females most of them were presented with mitral stenosis (68.5%). 05 (14.2%) were presented with cardiomyopathies and 04 (11.4%) were presented with mitral regurgitation. Only 01 (2.8%) patient was presented with congenital heart disease viz atrial septal defect (ASD).

Diagnosis	Frequency (n=35)	Percentage
Mitral stenosis	24	68.5 %
Mitral regurgitation	04	11.4 %
Cardiomyopathy	05	14.2 %
Valve Replacement	01	2.8 %
Congenital heart disease (ASD)	01	2.8 %

Table-III. Spectrum of Cardiac Diseases

Table-IV shows maternal outcome in terms of cardiac and obstetric complications. Majority of them were ultimately presented with pulmonary hypertension (82.8%). 18(51.4%) had pulmonary edema, 04(11.4%) had arrhythmias, 04(2.8%) had pulmonary embolism and 01(2.8%) of them presented with hemiplegia.

With respect to obstetric complications, reduced fetal movements was observed in 08 (22.8%) and fetal distress was in 06 (17.1%) of the pregnant females. 02 (5.7%) pregnancies ended in fetal death (intrauterine death). There were 08 (22.8%) patients who had preterm labor.

Cardiac Complications	Frequency (n=35)	Percentage
Pulmonary embolism	01	2.8 %
Pulmonary edema	18	51.4 %
Hemiplegia	01	2.8 %
Pulmonary Hypertension	29	82.8 %
Obstetric Complications		
Intra uterine death (IUD)	02	5.7 %
Reduced fetal movement	08	22.8 %
Preterm labour	08	22.8 %
Fetal distress	06	17.1 %

Table-IV. Maternal outcomes

With respect to fetal outcomes Table-V shows that 04 (11.4%) babies had birth weight of less than 1.5 kg, 12 (34.2%) had 1.5-2.0 kg, 15 (42.8%) were in range of 2-2.5 kg and 04 (11.4%) were more than 2.5 kg. 27 (77.1%) fetuses were born at term and 08 (22.8%) were born preterm. Cleft lip and atrial septal defect were the only two identified congenital anomalies in newborn delivered by our pregnant patients.

		Frequency n=35	Percentage
Birth Weight	< 1.5 kg	04	11.4 %
	1.5 - 2 kg	12	34.2 %
	2 - 2.5 kg	15	42.8%
	2.5 - 3 kg	04	11.4 %
Fetal Age	Preterm	08	22.8 %
	Term	27	77.1 %
Congenital Abnormality	Gum anomaly	01	2.8 %
	ASD	01	2.8 %

Table-V. Fetal outcomes

DISCUSSION

Cardiac disease is the most important medical disorder affecting pregnant females. In this study prevalence of cardiac disease was found to be 1.2%. The prevalence reported worldwide is from 1-4%.[9] although its prevalence is relatively low in pregnant women, cardiac disease is the most important cause of maternal morbidity and mortality. During pregnancy problems may arise due to hemodynamic burden and the hypercoagulable state of pregnancy.[10]

0ur study shows that most patients are in younger age group i.e. 20-25 years and most women reported to the hospital during second trimester of pregnancy. Despite advent of antibiotics and efforts for up lift of health facilities, rheumatic fever is still affecting a lot of young girls and females of reproductive age group[11, 12] The treatment at early age leads the female to a healthy reproductive age.

The spectrum of cardiac disease observed in this study is congenital and acquired cardiac diseases. The acquired diseases are valvular heart diseases, ischemic heart disease and cardiomyopathy.[13] In developed countries the studies reveals that number of pregnant females with congenital cardiac lesions is more than females with valvular heart diseases.[14, 15, 16] This is due to the fact that after birth most congenital lesions are diagnosed and treated medically or surgically. Better health care and optimal living standards have decreased the rate of acquired post rheumatic vulvular lesions in females of developed countries.[17] On the other hand the incidence of post rheumatic valvular lesions is more common than congenital lesions in developing part of the world like South East Asia, Africa and Iran.[18, 19] The most common disease found in our study is mitral stenosis. The studies conducted in India, Pakistan, Africa and Iran revealed that vulvular heart disease is the commonest in females who had cardiac disease and become pregnant and mitral stenosis is the lesion which is found in maximum.[20, 21, 22, 23] Cardiomyopathy (CMP) is potentially lethal cardiac complication of late pregnancy and early perpeurium.[24] In our study most patients presented with CMP in antepartum period. Patients should be properly counseled regarding worsening of cardiac conditions in next pregnancy.

The maternal cardiac status is evaluated by New York Heart Association classification.[25] The mothers belonging to functional status of class I and II have less risk than mothers belonging to class III and IV.[26] In this study 53% of patients were in NYHA class I and II. 26% of patients were in class III and IV. The compromised cardiac status of the mother leads to different obstetric and cardiac complications.[27] In this study 01 patient (2.8%) develop pulmonary embolism. Pulmonary edema was in 18(51.4%), pulmonary hypertension in (82.8%) and arrhythmias in 04 (11.4%) of females. Obstetric complications were reduced fetal movements in 08 (22.8%), fetal distress 08 (22.8%), pre-term labor and IUD in 02 (5.7%) and fetal distress in 06 (17.1%) patients. The complications were mostly seen in patients belonging to NYHA class III and IV. Some other studies also reveal the association of poor fetal and maternal out come in poor functional heart status.[28, 29]

In our study there were 08 (22.8%) preterm births. After delivery neonatal weight was checked. Most of the babies were in 2-2.5 kg weight category i.e. 15 (42.8%), 12 (34.2%) were of 1.5-2 kg weight and 04 (11.4%) babies were less than 1.5 kg weight. Some other studies[30] also reveals incidence of low birth weight and IUGR in babies of mother with cardiac disease. In view of high risk of low birth weight, pre term delivery, IUGR and IUD the antenatal fetal surveillance is man-

datory.[31] It should be provided to every pregnant female with cardiac disease. This study reveals that pregnancy with cardiac disease is a complicated condition. It demands multi-disciplinary care of female and her neonate. The cardiac condition lays burden on maternal outcome during pregnancy, continuous care and monitoring can reduce the maternal and fetal morbidity and mortality. These patients should be recognized early, have regular follow up visits and counseling. This can improve maternal tolerance to the burden laid by the pregnancy and support fetal growth and neonatal survival.

CONCLUSION

The overall prevalence of cardiac diseases during pregnancy was found to be 1.3% in this study. Most common affected age group was of 20-25 years. Most common cardiac disease found in our patient was mitral stenosis. 02 pregnancies ended in intrauterine fetal death. 08 babies were born preterm. Cleft lip and atrial septal defect were the only two identified congenital anomalies in newborn delivered by our pregnant patients. An improvement in modern techniques of monitoring, better understanding of pathophysiology of cardiac disease and multi-disciplinary care can lead to substantial improvement in the outcome of pregnant cardiac patients.

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