

A Retrospective Observational Study to Assess Outcomes in Pregnant Women with Cardiac Complications in Obstetrics and Gynecology Department in Tertiary Care Center

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Abstract

Aim: To evaluate maternal outcomes in pregnant women with heart complications, focusing on age, delivery method, baby weight, APGAR scores, and major complications. **Material and Methods:** This retrospective observational study was conducted at Sri Venkateshwara Institute of Medical Sciences, Tirupati, India. The study involved 90 participants, with data collected on maternal age, delivery methods, baby weight, APGAR scores, and major complications. Ethical approval was obtained from the Institutional Ethical Committee to ensure adherence to ethical standards. **Result and Discussion:** The age distribution of participants ranged from 18 to 40 years, with 46% aged 24-29 years and 40% aged 18-23 years. Cardiac dysfunction was present in 28% of patients, and 24% had congenital heart disease (CHD). The findings highlight the importance of identifying high-risk age groups and understanding the prevalence of cardiac conditions such as cardiac dysfunction and CHD among pregnant women. Monitoring stillbirth rates and assessing infant responsiveness through APGAR scores are critical. Proactive management strategies are essential to mitigate morbidity associated with pregnancy-related complications. **Conclusion:** The study underscores the significance of cardio-obstetrics in managing cardiovascular health during pregnancy. By identifying high-risk groups and complications, healthcare providers can adopt proactive strategies to improve maternal and fetal outcomes.

Key words: APGAR score, cardiac dysfunction, congenital heart disease, pregnancy, retrospective observational study, risk management

INTRODUCTION

The multidisciplinary discipline of cardio-obstetrics has grown in importance and calls for a collaborative effort to manage cardiovascular illness during pregnancy.^[1] Pregnancy-related hemodynamic stress, hypertension, hypercholesterolemia, myocardial infarction, cardiomyopathy, arrhythmia, valvular disease, thromboembolic disease, aortic disease, and cerebrovascular illness or just a few of cardiac elements that can occur during pregnancy can result in difficulties with the heart and pregnancy.^[2] The fatalities related to pregnancy have increased from 7.2 to 17.2 deaths/100,000 live births in the USA from 1987 to 2015. The majority of the time,

cardiac issues are mild; but, catastrophic or life-threatening complications can happen, and these kinds of difficulties have critical long-term repercussions on the mother's and her child's health. It is possible to avoid some of these issues.^[3]

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As per the statistics of the American College of Obstetrics and Gynecologists, advanced age, hypertension, ethnicity, and obesity factors are the causes that lead to cardiovascular-related demise in pregnancy patients. To address the significance of cardiovascular disease in total maternal mortality, strategies for integrated cardiology and obstetric care have been proposed. Cardio obstetrics is a team-based approach to maternal care that involves co-operation between the fields of maternal-fetal medicine, cardiology, anesthesiology, neonatology, nursing, social work, and pharmacy.^[4]

The aim of the current study is to assess the cardiac outcomes in cardiac complications in the obstetrics and gynecology department. The main objectives of the current study are to find the most affected age group, most occurred cardiac complications, type of delivery, check do cardiac complications cause any stillbirths, baby reactivates, and response from APGAR scale values.

METHODOLOGY

This research adopts a retrospective observational study to investigate cardiac complications in pregnant women in the OBG department and conducted within the Department of Obstetrics and Gynecology at Sri Venkateswara Institute of Medical Sciences, Tirupati, Andhra Pradesh, India. A minimum sample size of 90 participants was targeted, and data will be sourced from various avenues to ensure a comprehensive representation including patient records for demographic details, structured interviews for clinical history, and patient case profiles for additional clinical information. The studies were planned over 6 months from October 2022 to March 2023. Inclusion criteria encompass individuals aged above 18 years and below 43 years, and only pregnant women were included. Exclusion criteria include below engineers and those above 43 years more excluded, subjects with a history of abortion were excluded, and those without diagnosed cardiac disease irrespective of signs and symptoms. The study procedure taint regulatory clearance from the Institutional Ethical Committee followed by patient recruitment data extraction past clinical file examinations and the data recording to ensure accuracy and consistency.

Statistical analysis

For the demographic characteristics, descriptive statistics including frequencies and percentages were computed to analyze the distribution of subjects across different age groups and the prevalence of various cardiac complications during pregnancy. Mean and standard deviation (SD) were calculated to summarize the average age of affected individuals. Chi-square tests were employed to assess associations between categorical variables such as age groups and types of cardiac complications. In addition, inferential statistics were conducted to examine the relationship between

cardiac complications and delivery methods, utilizing Chi-square tests. Finally, descriptive statistics were used to analyze newborn characteristics such as weight distribution and APGAR scores, including mean and SD for weight and frequencies for APGAR scale values.

RESULTS

After thorough screening of patients for study inclusion, a total of about 90 subjects were included in the study and the mean age is 25.2. Among 90 subjects, 36 (40%) in the age group of 18–23, 41 (46%) in the age group of 24–29, 11 (12%) in the age group of 30–35, and 2 (2%) in the age group of 36–41. The age group of 24–29 was the most affected with cardiac complications in pregnancy in our study. The mean \pm SD age affected is 25.2 ± 4.22 years [Tables 1 and 2].

Among them, 22 (24%) were affected with congenital heart disease (CHD), 18 (20%) were affected with chronic rheumatic heart disease (CRHD), 12 (13%) were affected with cardio vascular disease, 4 (5%) were affected with gestational hypertension, 7 (8%) were affected with cardiomyopathy, 2 (2%) were affected with valvular disease, and 25 (28%) were affected with cardiac dysfunction. Showing that the most affected cardiac complication with pregnancy is cardiac dysfunction and the least affected is valvular disease [Table 3].

Table 1: Demographic details of the study participants

Parameters	Value (n=90)
Age (mean \pm SD)	25.2 \pm 4.22
Age distribution	
18–23	36
24–29	41
30–35	11
36–41	2
Delivery type	
Lower segment cesarean section	80
Assisted vaginal delivery	10
Abortions	0
Maternal outcomes	
Baby boy	37
Baby girl	53
Baby body weight (kg), mean \pm SD	2.59 \pm 0.62
Baby weight distribution	
0–1.0	1
1.1–2.0	18
2.1–3.0	46
3.1–4.0	25

SD: Standard deviation

Among 90 participants, about 80 (89%) were done with lower segment cesarean section (LSCS) and the remaining 10 (11%) with assisted vaginal delivery. Showing that cardiac complications in pregnancy majorly leads to cesarean delivery [Table 1].

A total of about 90 participants were included among them 53 (60%) were female babies, 36 (40%) were male, and a stillbirth 1 (1%). Showing cardiac complications in pregnant women may lead to stillbirth [Tables 1 and 4].

Among study participants, newborn babies' weights are divided into four class intervals, i.e., (0–1; 1.1–2; 2.1–3; and 3.1–4). This shows that the majority of the babies' weights were in the class intervals of 2.1–3 (51%), the least are in the class interval of 0–1(1%), and the class interval 1.1–2 is having 18 babies (20%), and the class interval 3.1–4 is having 25 babies (28%). The mean \pm SD of the newborn weight is 2.59 ± 0.62 kg [Tables 1 and 5].

From all the newborn, the 1st h APGAR scale values of class interval (0–3) show only 06 babies, 34 babies in between class intervals of (4–6), and 50 babies in between class intervals of (7–10). Moreover, the 5th h APGAR scale values show that only 1 baby was present in between class intervals of (0–3), 2 between (4–6), and the majority in between class intervals of (7–10), i.e., 87 babies [Table 6].

DISCUSSION

Cardiac complications during pregnancy are a significant concern for both the mother and the growing fetus. Pregnancy puts a significant strain on the cardiovascular system, and women with pre-existing cardiac conditions are at higher risk of complications while in pregnancy.^[5-9] In the current study, we are aware of the major causing cardiac complications during pregnancy such as CHD, CRHD, valvular disease, known cardiovascular diseases, gestational hypertension, cardiomyopathy, and dysfunction.

The majority of the cases are being seen from cardiac dysfunction. Moreover, the most affected age group of the patients is between 23 and 29.^[10-12] These cardiac complication in pregnancy also leads to stillbirth which is also found in our study. Moreover, when a woman is pre-diagnosed with cardiac complications before pregnancy then she has a 100% chance of avoiding risk during pregnancy. Early detection in pregnancy, i.e., before 6th month, she has a chance to avoid risk, after that month, it is a risky process involved with surgeries in complex cases and treatment in some minor cases.^[13-15]

In our current study, the most affected cardiac complication with pregnancy is cardiac dysfunction and the least affected is valvular disease. Moreover, cardiac complication in

Table 2: Age-wise distribution among all patients

Age group	Number of patients (%)
18–23	36 (40)
24–29	41 (46)
30–35	11 (12)
36–41	2 (2)

Table 3: Distribution based on most affected cardiac complication in the current study

Cardiac complications	Number of patients (%)
CHD	22 (24)
CRHD	18 (20)
CVD	12 (13)
Hypertension	4 (5)
Cardiomyopathy	7 (8)
Valvular disease	2 (2)
Cardiac dysfunction	25 (28)

CHD: Congenital heart disease, CVD: Cardiovascular disease, CRHD: Chronic rheumatic heart disease

Table 4: Distribution of newborns by gender

Baby gender	Number of babies (%)
Male	36 (40)
Female	53 (59)
Stillborn male	1 (1)

Table 5: Distribution of newborns by weight

Class interval (kg)	Frequency, n (%)
0–1.0	1 (1)
1.1–2.0	18 (20)
2.1–3.0	46 (51)
3.1–4.0	25 (28)

Table 6: Distribution of babies based on 1st h and 5th h APGAR values

Class interval	1 st h APGAR scale value	5 th h APGAR scale value
0–3	6	1
4–6	34	2
7–10	50	87

pregnancy majorly leads to cesarean delivery. Moreover, showing that cardiac complications in pregnant women may lead to stillbirth.^[16,17]

The present study also shows that the majority of the babies are within the weight class interval of 2.1–3 kg (36) and the least, i.e., 0–1 kg (1).

The 1st and 5th h APGAR scale values show that the majority of the newborns are healthy as they were present in between the class interval of 7–10. (WHO-based APGAR scale guidelines state that APGAR scale values of 7–10 are advised normal).

CONCLUSION

In this study, we have concluded that the women in the age group of 24–29 (41) are mostly affected with cardiac complications in pregnancy, and the mean age is 25 years. Moreover, concluded that the most affected cardiac complication in pregnancy is cardiac dysfunction (28%) and the least affected is valvular disease (2%). Moreover, women with cardiac complications in pregnancy are mostly undergone through LSCS, i.e., 89%. The cardiac complication in pregnant women may lead to stillbirth. Most of the newborn are within a healthy weight range (2–4 kg). Based on the APGAR rating, infants born to moms with heart complications had just 1% anomaly.

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