



A CLINICAL STUDY OF MATERNAL AND PERINATAL OUTCOME OF CARDIAC DISEASES COMPLICATING PREGNANCY IN A TERTIARY CARE HOSPITAL

Gynaecology

Dr. Rohini D K	Post Graduate Student in Dept of Obstetrics and Gynecology, Bangalore Medical college and research institute, Bengaluru.
Dr. Varun G Huilgol*	Senior resident, Vardhaman Mahavir medical college, Safdarjung hospital, New Delhi *Corresponding Author
Dr. Padma B R	Post Graduate Student in Dept of Obstetrics and Gynecology, Bangalore Medical college and research institute, Bengaluru.
Dr. Gopalkrishna B Huilgol	Professor, Dept of Obstetrics and Gynecology, Bangalore Medical college and research institute, Bengaluru.

ABSTRACT

Introduction: The incidence of Cardio Vascular Disease in pregnancy has remained stable for many years since the significant decrease in RHD is compensated by increase in CHD in pregnant women. Population based studies have reported incidence of CVD in pregnancy varies between 0.1 to 4% and Cardiac disease remains a significant cause of non obstetric morbidity and mortality during pregnancy.

Methods: It is a prospective observational study conducted on 50 pregnant women with cardiovascular disease >28 wks gestation admitted for labour to VVH attached to BMCRI, Bangalore between the period of July, 2013 to August 2014. The essential information of the patients studied was gathered and recorded in the detailed proforma. The maternal complications, related to the cardiac disease and obstetric complications, the perinatal outcome of the cases were analysed.

Results: Out of 50 cases in the study Cardiac Disease was found to complicate 0.22% of pregnancy, RHD complicated about 46% and CHD: 44%, with isolated MS: 20%, ASD: 20% being the predominant lesion. The mean duration of onset of Cardiac Disease was 3.5 years, 64% of patients belong to NYHA class II and 16% belong to XIV class I. 32% of patients had undergone Cardiac Intervention before pregnancy. Mean gestational age of delivery was 38 wks (78%) and 82% of them had spontaneous onset of labour and 18% of them had induction of labour. 50% had spontaneous vaginal delivery and 32% had C. Section with 6% instrumental delivery. CCF and Pulmonary HTN were the two main complications with 14% and 10% respectively. One maternal death due to acute pulmonary oedema secondary to RHD with MV repair. 10% of patients had PPH, the main obstetrical complication. The incidence of pre term delivery was 12% and term delivery 88%, and 54% of babies weighed 1.5-2.5kg, live birth rate: 96%, still birth: 4%, NICU admission: 18%, 4% of PNM and 4% of CHD of new born was seen.

Interpretation and Conclusion: Majority of women with Cardiac Disease in pregnancy can have a safe pregnancy and delivery provided proper medical care is given. The maternal and perinatal outcome in these patients depends mainly on the functional cardiac status of the mother at the time of pregnancy. The risk of maternal and perinatal morbidity is greater in these patients with functional class of NYHA class III and IV. Surgical correction of the cardiac disease before pregnancy has a better maternal and perinatal outcome and they can tolerate pregnancy well.

KEYWORDS

cardiac disease; RHD-Rheumatic heart disease; CHD-Congenital heart disease; NYHA-Newyork heart association.

OBJECTIVES

1. To study the complications during the antenatal period, intrapartum period and postnatal period in pregnancy with cardiovascular disease.
2. To study the maternal outcome in cardiac disease complicating pregnancy.
3. To study the perinatal outcome.

METHODOLOGY: In the present study 50 cases of pregnant women with cardiac disease more than 28 weeks gestation who are being admitted for delivery to Vani Vilas Hospital affiliated to Bangalore Medical College and Research Institute (BMCRI), Bangalore in the period from July 2013 to August 2014.

Proper history of the patient is taken, after clinical examination a clinical diagnosis was made in consultation with the cardiologist. The necessary investigations like routine blood test, urine analysis, ECG, echocardiogram were done in many of the cases. The maternal outcome that is the incidence of the disease, type of cardiac disease, NYHA classification, the complications like CCF, pulmonary embolism, pulmonary edema, atrial fibrillation, infective endocarditis and mortality were analysed.

Perinatal outcome in terms of preterm, IUGR, low birth weight, Intra uterine death, still birth, congenital disease of cardia of the new born and perinatal mortality were analysed.

Inclusion criteria

1. Patients who are willing to give informed consent for the study.
2. All antenatal women with cardiac disease admitted to VVH and Bowring and Lady Curzon hospital.
3. Antenatal cases with gestational age above 28 weeks gestation

with cardiac disease.

4. Antenatal cases with previous cardiac surgical repair.

Exclusion criteria

1. All antenatal women with cardiac diseases with < 28 wks gestation.
2. Pregnancy with cardiac diseases associated with risk factors like gestational diabetes, preeclampsia, anaemia, thyroid disease will be excluded.

Study design: Prospective observational study

Statistical method: Descriptive and inferential statistical analysis has been carried out. Results on continuous measurements are presented on mean $\pm$ SD (mini - max) and results on categorical measurements are presented in numbers (%)

RESULTS

Incidence of Cardiac disease

TOTAL NO. OF DELIVERIES	TOTAL NO. OF CARDIAC CASES	PERCENTAGES
22277	50	0.22

During this period of study a total number of deliveries in VVH were 22277 and 50 cases of pregnant women with cardiac disease admitted to VVH satisfying the inclusion criteria was studied, the incidence was 0.22%

Age wise distribution

Age In Years	No. Of Patients	Percentage
20-25	25	50
25-30	20	40

30-35	2	4
35-40	3	6
TOTAL	50	100

Mean age = 25.2 years

The above table depicts the age wise distribution of cases, 50% of study group were in the age group of 20-25 years and 40% of patients belong to 26-30 years age group.

Socio-economic status distribution

Socio- Economic Status	No. Of Cases	Percentage (%)
Lower	28	56
Lower middle	16	32
Upper middle	6	12
Total	50	100

The above table depicts the distribution of Socio-economic status of the cases studied, majority of women were in the lower socio-economic status 56% and 32% of the cases belong to the lower middle status.

Gravida status

Parity	No. Of Patients	Percentage
Primi	29	58
G2	9	18
G3	10	20
>G4	2	4
Total	50	100

The classification of study group by gravida status, it is evident from the findings that the majority of the study groups were PrimiGravida constituting 58%, followed by Gravida3 is 20%, Gravida2 is 18% and >Gravida 4 is 4%.

Duration of cardiac disease

Duration	No. Of Patients	Percentage
During present pregnancy	17	34
1-5yr	19	38
6-10yr	7	14
>10yr	7	14
Total	50	100

Mean Duration of disease = 3.5 yrs

The duration of the cardiac disease of the cases studied, 38% of the patients belong to the period 1-5 years, 34% for which the cardiac disease was diagnosed during the present pregnancy.

Etiological classification

Etiology Of Heart Disease	No. Of Cases	Percentage
Rheumatic	23	46
Congenital	22	44
CHD+RHD	1	2
Cardiomyopathy	5	10
Total	50	100

The cases studied were classified based on their etiological cause of the cardiac disease, RHD constituted about 46% and CHD 44% and 10% cardiomyopathy, this depicts the changing trend in the etiology of the cardiac disease in pregnancy compared to decades earlier.

NYHA(functional) classification at the time of admission

NYHA Classification	No. Of Patients	Percentage
Class I	8	16
Class II	32	64
Class III	7	14
Class IV	3	6
Total	50	100

The majority of the cases studied belong to NYHA class I and II with class I constituting 16% and class II 64% this is because many of the patients studied were evaluated and diagnosed and were on treatment for cardiac disease before pregnancy.

Type of heart disease and functional class

TYPE OF DISEASE	CLASS I	CLASS II	CLASS III	CLASS IV
RHD	3	16	3	1

CHD	5	15	0	1
CHD+RHD	0	1	0	0
Cardiomyopathy	0	0	4	1

The type of heart disease and functional class, the majority of RHD cases belong to class II and CHD cases belong to class II and all cases of PPCM belong to class III and IV.

Distribution of prior cardiac interventions

TREATMENT	NO. OF CASES	PERCENTAGE
Not on any treatment	9	18
On medication	25	50
Undergone cardiac intervention	16	32
Total	50	100

The distribution of cases with Prior Cardiac Interventions, 32% of the cases had undergone cardiac intervention before pregnancy for various cardiac disease and complications, 18% of the patients were not on any treatment as they were not diagnosed to have cardiac disease before pregnancy and 50% of the cases were on medications for cardiac disease.

Type of cardiac intervention

CARDIAC INTERVENTION	NO. OF CASES	PERCENTAGE
PTMC	8	16
ASD closure	3	6
VSD closure+ PDA ligation	1	2
PDA ligation	1	2
Mitral valve repair	3	6

The type of cardiac interventions that the patients of our study have undergone before pregnancy, 16% of the patients had undergone PTMC before pregnancy and 6% of the patients had mitral valve repair.

Timing of delivery/ Gestational age in Weeks

GESTATIONAL AGE	NO. OF CASES	PERCENTAGE
28-36+6wks	6	12
37-39+6wks	39	78
40-42wks	5	10
Total	50	100

The timing of delivery i.e. gestational age at the time of delivery, 78% of the patients had term delivery of gestational age > 37 wks, 12% of the patients delivered between 28-36 wks+ 6 days and 10% after 40 wks.

Mode of delivery

	Spontaneous Vaginal	Assisted Breech	Forceps Delivery	Ventouse Delivery	LSCS	VBAC
No. Of Cases	28	2	1	2	16	1
Percentage	56	4	2	4	32	2

The mode of delivery of the cases, 56% of patients had spontaneous vaginal delivery, 32% of cases had LSCS for obstetric indication as our centre is a tertiary care centre and many of the cases were referred from outside in labour, one case had VBAC, one patient delivered by forceps, two cases by ventouse delivery and two cases by assisted breech delivery.

Maternal complications related to cardiac disease

COMPLICATIONS	NO. OF PATIENTS	PERCENTAGE
Congestive cardiac failure	5	10
Pulmonary edema	2	4
Pulmonary hypertension	7	14
Maternal death	1	2

The maternal complication related to cardiac disease seen in the cases of our study, 14% of patients had pulmonary HTN and 10% CCF with one case of maternal death with 4% of patients with pulmonary edema

Non cardiac complications

COMPLICATIONS	NO. OF CASES	PERCENTAGE
Atonic PPH	5	10
Traumatic PPH	2	4
Peripartum hysterectomy	1	2
Respiratory tract infection	2	4

The non-cardiac complications seen in our study, 10% of PPH. Routine protocol of AMTSL was done and with I/V concentrated oxytocin infusion but PPH rate 10% was seen which can be partly attributed to anticoagulants.

Maternal mortality- 1

Age	Obstetric Index	Type Of Lesion	NYHA Classification	Previous History Of CCF	Time Of Death	%	Cause Of Death
26 yrs	G3P1L1A1	RHD with MS with mitral valve repair on anticoagulant LVEF- 55%	Class II	-	Postpartum D8	2	Acute pulmonary oedema

Incidence of term/preterm delivery

RESULTS	NO. OF BABIES	PERCENTAGE
Term	44	88
Preterm	6	12
Total	50	100

The incidence of preterm and term deliveries seen in our study, 88% of the patients had term delivery and 12% had preterm delivery, therefore a better perinatal outcome has been seen in our study.

Outcome with respect to foetal weight

BIRTH WEIGHT (kg)	NO. OF BABIES	PERCENTAGE
<1.5	2	4
1.5-2.5	27	54
>2.5	21	42
Total	50	100

The outcome with respect to foetal weight, it is seen that 54% of babies weighed between 1.5 - 2.5 kgs and 42% of the babies weighed > 2.5 kgs, 4% of the babies weighed <1.5 kgs with a mean weight of 2.6 kgs.

Perinatal morbidity in relation to functional class

NYHA Class	No. Of NICU Admission	Percentage	No. Of Neonatal Death	Percentage
CLASS I & II	3	6	0	0
CLASS III & IV	6	12	2	4

The perinatal morbidity in relation to functional class, 12% of class III and IV NYHA group had NICU admission of the babies due to respiratory distress, birth asphyxia and due to pre-maturity and 6% of the babies admitted to NICU belong to NYHA class I and II.

Neonatal death -2cases

Foetal outcome

OUTCOME	NO. OF BABIES	PERCENTAGE
Live births	48	96
Still birth	2	4
Low birth weight	14	28
NICU admission	9	18
CHD of newborn	2	4
Congenital anomalies	0	0

The foetal outcome of the cases studied with 96% of live birth, 4% of IUD, 18% of NICU admission, 4% of Neonates with CHD of newborn were seen in this study.

DISCUSSION:

- This observational study was conducted between July 2013 to August 2014 in VVH attached to BMCRI, in this study 50 pregnant women with cardiac disease admitted to VVH for delivery was studied. The incidence in the present study is 0.22%.
- This present study was compared with other studies conducted by various others.
- Incidence in our study was 0.22%, in other studies- Vidyadhar B. Bangal, Rashmi, K. Singh et al. (2012) 1.3%, Suman Puri, Aman Bharti, et al. (2013) 4.3% and Maboary Diau, Adame Kane et al. (2011) 2.7%
- Distribution of heart disease with parity in our study is almost similar to that of Suman Puri, Aman, Bharti et al., the increasing awareness about the risk of pregnancy in cardiac patients is probably responsible for the low incidence of heart disease in pregnancy with high parity women.
- Comparison of etiological classification.

Authors and year	RHD	CHD	Others
Claartje M. Huisman et al. (2013)	92%	8%	4.2%

Konar Hiralal and Chaudhuri Snehamay (2012)	69.4%	21.3%	9.2%
E.S.Abdel Hady, M.Elshamay et al. (2005)	89.5%	9.3%	-
N. Bhatia, S. Lal, G. Behra et al. (2003)	88%	29.95%	-
Present study	46%	44%	10%

Comparison of maternal mortality

Authors and year	Percentage (%)
E.S.Abdel Hady, M.Elshamay et al. (2005)	1.16
Konar Hiralal and Chaudhuri Snehamay (2012)	1.06
Present study	2.00

Comparison of perinatal mortality

Authors and year	Percentage (%)
E.S.Abdel Hady, M.Elshamay et al. (2005)	2.32
Konar Hiralal and Chaudhuri Snehamay (2012)	4
Present study	4

CONCLUSION:

Majority of women with cardiac disease in pregnancy can have safe pregnancy and child birth provided the disease is diagnosed and evaluated before pregnancy and treatment started at the right time and patient delivers in a tertiary care centre.

Incidence of pregnancy with cardiac disease admitted for labour in our study was 0.22%.

PNM was 4%, with one case of maternal death.

RHD still predominant but incidence of RHD in developing countries has been reduced by wide spread use of antibiotics effective against the streptococcal bacterium which causes Rheumatic fever.

Early detection of CHD and surgical correction prior to pregnancy was associated with better pregnancy outcome.

Patients with CHD can have better maternal and perinatal outcome if early detection, prompt treatment, meticulous antenatal, and postnatal care is given to the patient at the tertiary level.

It is not merely about the statistics it is about extending the rapidly expanding frontier of cardio vascular medicine to a small yet very special population where each successful pregnancy will serve not one but at least two precious lives.

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