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Congenital Heart Diseases Complicating Pregnancy and Obstetric Outcome

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ABSTRACT: Heart disease of varying severity complicates about 1% of pregnancies and disease of the Cardio Vascular System head the list of causes of death in general population. In the present obstetric management of fifty cases were analyzed. The study shows that lesion were diagnosed in childhood and among the lesion ASD (Atrial Septal Defect) stands at top. The other medical complications were also reported.

KEYWORDS: Obstetric Management, ASD, Heart disease

I. INTRODUCTION

Congenital Heart Disease has become more prevalent in women of child bearing age. The change is due to increase success in the treatment of young children born with various congenital heart defects.
Most women present in pregnancy with NYHA Class 1 or Class 2 lesions and remain largely asymptomatic. Women at increase risk for a cardiac event or arrhythmia are NYHA function class > 2 or cyanosis or left heart obstruction and systemic ventricular dysfunction. Specific lesions are separated into cyanotic and acyanotic types:

ACYANOTIC CONGENITAL HEART DISEASES:

1. **ATRIAL SEPTAL DEFECT (ASD)**: ASD is most common congenital lesion recognized in adult life. Pregnancy is generally well tolerated in this group of patients. Specific treatment is usually not required.
2. **VENTRICULAR SEPTAL DEFECT (VSD)**: A VSD is present in 1.5 to 2.5 of 1000 women with a pregnancy resulting in live birth. Many of these defects close spontaneously. Those that do not are often surgically corrected before child bearing. Whittemore et al, described the outcome of 98 pregnancies in 50 patient with VSD, most of whom had uncorrected lesions. The live born infant rate was 80%.
3. **PATENT DUCTUS ARTERIOSUS (PDA)**: Patient with uncorrected PDA with a small to moderate size ductus and normal pulmonary arterial pressure can also expect at uncomplicated pregnancy. Patients who have corrected PDA generally have an uncomplicated course in pregnancy. Whittermore et al (1982) reported the outcome of 105 pregnancies in 42 women with PDA all of which had been surgically corrected. The live born infant rate was 79% and there were no maternal complications. Many of these patients have had corrected surgery before pregnancies. However in patient with uncorrected coarctation of aorta, pregnancy was once thought to carry such a severe risk to life that termination of pregnancy and sterilization were recommended. More recently collected series in patients revealed a low maternal mortality with good fetal outcome. Deal & wooley reported that in 185 pregnancies in 83 patients with uncorrected COA, they found a pregnancy loss rate of 18.9%, as shown by Weiss et al (1998).
4. **PULMONARY STENOSIS (PS)**: PS of mild to moderate nature that is associated with transvalvular pressure gradient less than 80 mm Hg is generally well tolerated in pregnancy. Clark et al (1991) cautions about the risk of right sided heart failure in patients with severe PS.
5. **EISENMENGER SYNDROME (ES)**: ES is an acquired elevation of pulmonary vascular resistance and pulmonary artery pressure as a result of left to right intra cardiac shunt. This eventually resulted in right to left or bidirectional shunt with subsequent cyanosis and polycythemia. Many reports describe the poor outcome of patient with ES. Who became pregnant. Gleicher et al (1979) describes 70 pregnancies in 44 women with ES.

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Maternal mortality rate was 36.1%, 26.7% and 33.3% for 1st, 2nd, and 3rd pregnancies, respectively, as mentioned by Jeyamalar R et al (1992).

6. **PRIMARY PULMONARY HYPERTENSION**: Primary pulmonary hypertension is uncommon and there are few reports of pregnancy associated with this condition. The maternal mortality rate is 30-56%. Premature deliveries indicated for maternal reasons in majority of cases, as mentioned by Sinnenberg RJ (1992) and Mc Caffrey RM and Dunn LJ (1964). Meyer et al (1964) described a series of 57 pregnancies in such patients with a maternal mortality of 7% and a fetal loss rate of 22%. The increase in maternal mortality and morbidity is due to the decrease in systemic vascular resistance associated with pregnancy and a subsequent rise in the patients with right to left shunt. This leads to further cyanosis, a compensatory rise in hematocrit, and a corresponding decrease in arterial oxygen saturation for patients entering pregnancy with corrected lesion, the prognosis is favorable.

CYANOTIC CONGENITAL HEART DISEASE:

TETRALOGY OF FALLOT (TOF): Tetralogy of Fallot is the most common cyanotic heart lesion that permits survival into adulthood. For the patient without prior surgical correction, the prognosis is guarded. Singh et al (1982) reported the outcomes of 40 pregnancies in 27 patients with surgically corrected TOF. There were no maternal deaths.

II. MATERIAL AND METHODS

The present study comprises of patients admitted in Government Maternity Hospital, Nayapul, Osmania Medical College, Hyderabad with congenital heart disease. The total No. of admission into Govt. Maternity Hospital is 44,593. Total number of heart disease patients was 177 and this includes 55 patients with congenital heart disease, the obstetric management. Type of cardiac lesion, when the lesion was diagnosed, when surgically corrected, age of correction, medical and obstetric management, mode of delivery and indication for caesarean section, and perinatal outcome were analyzed.

General Examination includes General condition, Temperature, Pulse rate, rhythm, volume, Respiratory rate, Blood pressure, Jugular venous pressure, Pallor, Edema, Hepatomegaly, Splenomegaly, Thyroid, Dental caries.

Cardio vascular system includes Heart sounds-S1, S2, Murmurs – Degree of murmur, Radiation of murmur and any other additional findings. Respiratory system: Lungs, e/o crepitations /wheeze.

Obstetric examination includes P/A – Uterus – height, Relaxed /acting, Presentation, Fetal heart rate, Liquor content, estimated fetal weight P/V – Cx – length, Dilatation, Pelvic assessment.

Mode of delivery - Vaginal, LSCS
Baby details - Sex, Weight, Apgar, Nursery admission.

INVESTIGATIONS:

1. Investigations to assess the cardiac status (a) Electro cardiogram (b) Echocardiography (c) Evaluation with the cardiologist.
2. Investigations to assess the complicating factors (a) Hemoglobin (b) Urine: Routine and microscopy, Culture sensitivity (c) Serum electrolytes (d) Serum uric acid, blood urea nitrogen, blood sugar.
3. Investigation for fetal growth and fetal wellbeing (a) Ultrasonography, EFW,GA, BPP, Liquor content, IUGR (b) Fetal Doppler

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TABLE 1

Sl. No.	Name	Age	Evaluated at Weeks of GA	IP No.	Gravity	P delivery	Gestalant in pregnancy	Type of lesion	When the lesion was detected	Surgical repair	Age at repair	Medical Complications	Obstetrics complications	Duration of labour	Mode of delivery	Indication	Post partum period
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Sunitha	24	28 weeks	11982	G2	2 ph	TG	ASD	Childhood	Corrected	<12 years	-	-	-	LSCS	Fetal distress	Period uneventful
2	Rajani	22	20 weeks	12192	G2	SPDD	TG	Primary	2nd pregnancy	Uncorrected	-	-	-	4 hrs	SPVD	-	"
3	Maheshwari	23	28 weeks	21292	G2	-	TG	TOF	Childhood	Corrected	<12 years	-	-	10 hrs	SPVD	-	"
4	Savitha	23	20 weeks	21396	G1	-	TG	VSD	1st pregnancy	Uncorrected	-	URTI	-	>12 hours	LSCS	Failure to progress	"
5	Rajitha	24	34 weeks	15997	G2	LSCS	TG	ASD	childhood	Corrected	14-16	-	-	-	LSCS	LSCS	"
6	Manga	25	24 weeks	16238	G2	SPDD	-	AS, AR	2nd pregnancy	Uncorrected	-	-	-	-	SPVD	-	"
7	Lalitha	21	28 weeks	22397	G2	LSCS	31 weeks	TGA	Childhood	Uncorrected	-	-	IUGR	-	LSCS	Pr. LSCS	"
8	Jhansi	25	26 weeks	11624	G3	LSCS	IG	VSD	3rd pregnancy	Uncorrected		Anaemia			LSCS	Pr. LSCS	"
9	Ayesha	30	26 weeks	1123	G4	SPVD	-	ASD	4th pregnancy	Uncorrected	-	-	-	2 hrs	SPVD	-	"
10	Praveen	34	28 weeks	11836	G5	SPVD	IG	PDA	Childhood	Corrected	>16 years		-	1 hr. 20	SPVD		"
11	Akhtar	21	32 weeks	29232	G1	-	34-35 weeks		1st pregnancy	Uncorrected	-	Anaemia	IUGR	12 hrs	SPVD	-	"
12	Ameena	22	30 weeks	19926	G1	-	TG	ASD	Childhood	Corrected	-	-	-	>12 hrs	Outlet	-	"
13	Vijayalaxmi	27	34 weeks	2362	G3	LSCS	TG	MVP AR	3rd pregnancy	Uncorrected	14-16	Anaemia	IUGR, low	-	LSCS	Pr. LSCS	"
14	Kalpana	23	30 weeks	4328	G1	-	TG	MVP AR	1st pregnancy	Uncorrected	-	URTI	-	10 hrs	SPVD	-	"
15	Sameena	26	28 weeks	16128	G3		IG	ASD	Childhood	Corrected		URTI			SPVD	2Pr. LSCS	"
16	Shanthi	26	20 weeks	18929	G2	LSCS	TG	VSD	2nd pregnancy	Uncorrected	-	-	-	2 hrs	LSCS	LSCS	"
17	Vijaya	27	34 weeks	28328	G3	LSCS	IG	VSD	1st pregnancy	Uncorrected	-	Anaemia	-	-	LSCS	Pr. LSCS	"
18	Farheen	21	30 weeks	29236	G2	SPVD	IG	Coarctation of aorta	Childhood	Uncorrected	>16 years	-	Fetal distress	-	LSCS	Fetal distress	"
19	Rahmula	22	20 weeks	29112	G1	-	TG	TR	1st pregnancy	Unanswered	14-16	bronchitis	-	11 hrs	SPVD	-	"
20	Bee Bee Begum	30	18 weeks	18326	G3	SPVD	TG	Coarctation	2nd pregnancy	Corrected	-	Anaemia	abnormal	-	LSCS	abnormal	"
21	Bujji	21	32 weeks	16328	G1	-	TG	ASD	Childhood	Corrected	14-16	Anaemia	-	10 hrs	SPVD	-	"
22	Shabana	24	34 weeks	10176	G2	LSCS	TG	Coarctation of aorta	Childhood	Uncorrected	-	-	-	-	LSCS	Pr. LSCS	"
23	Sheba	26	30 weeks	10432	G2	SPVD	IG	VSD	Childhood	Uncorrected	-	-	-	>12 hrs	Outlet	-	"
24	Shaheen	28	20 weeks	18326	G3	SPVD	IG	VSD	2nd pregnancy	Uncorrected	-	URTI	Oligo.*	-	LSCS	Oligo.*	"
25	Vasantha	24	26 weeks	18635	G2	SPVD	IG	ASD	2nd pregnancy	Corrected	>16 years	-	Oligo.*	-	LSCS	Oligo.*	"
26	Yashoda	26	28 weeks	19216	G2	SPVD	IG	Coarctation	childhood	Uncorrected	-	Non-asthetic	-	-	LSCS	Fetal	"
27	Susheela	22	24 weeks	18210	G2	LSCS	TG	Coarctation of aorta	childhood	Uncorrected	-	-	IUGR	-	LSCS	IUGR, Oligo*	Period uneventful
28	Sandhya	22	32weeks	11095	G2	LSCS	TG	MVP AR	2nd pregnancy	Uncorrected	-	-	Oligo.*	-	LSCS	-	"

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Sl. No.	Name	Age	Evaluated at Weeks of GA	IP No.	Gravid	Mode of delivery	Gestalant in pregnancy	Type of lesion	When the lesion was detected	Surgical repair	Age at repair	Medical Complications	Obsterics complications	Duration of labour	Mode of delivery	Indication	Post partum period
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
29	Rasheeda	25	30 weeks	17186	G2	LSCS	TG	TGA	childhood	Corrected	-	-	-	-	LSCS	-	"
30	Sunitha	23	20 weeks	5993	G2	SPVD	TG	ASD& PS	childhood	Uncorrected	-	-		2 hrs	LSCS	-	"
31	Geetha	20	32 weeks	1202	G1	-	TG	VSD	1st pregnancy	Uncorrected	-	URTI, Pyrexia	-	~12 hours	Outlet forceps	-	"
32	Vimala	20	34 weeks	11890	G1			ASD	childhood	Uncorrected		PIH		10 hrs	SPVD		"
33	Vimla	22	32 weeks	5883	G1	-	TG	ASD	1st pregnancy	Uncorrected	-	-	-	10 hrs	SPVD	-	"
34	Ghousia	19	30 weeks	1220	G1		TG	VSD	1st pregnancy	Uncorrected					Discharge		"
35	Shareefa	23	28weeks	28162	G1	-	TG	VSD&PAH	Childhood	Uncorrected		-	Oligo *	-	LSCS	Oligo *	"
36	Shobha	20	32 weeks	28236	G1	-	TG	VSD	Childhood	Corrected		-	-	11 hrs	Outlet	-	"
37	Lalitha	22	36weeks	11695	G1	-	TG	Contriatrium	1st pregnancy	Corrected	~12 years	PIH	-	10 hrs	SPVD	-	"
38	Bhavati	18	34 weeks	17111	G1	-	TG	Coarctation	1st pregnancy	Corrected	~12 years	-	-	8 hrs	SPVD	-	"
39	Farzana	21	24 weeks	10572	G1			IR	1st pregnancy	Uncorrected					Discharge		"
40	Farzana	30	26 weeks	18695	G2	SPVD	TG	VSD	1st pregnancy	Uncorrected	-	Anaemia	Abruption	1 hr. 45	SPVD	-	"
41	Sumalata	22	28weeks	15384	G2	SPVD	TG	IR	1st pregnancy	Uncorrected					Discharge		"
42	Sajida	30	26weeks	17314	G1	-	TG	ASD	Childhood	Uncorrected	-	PI, Anaemia	-	12 mts	SPVD	-	"
43	Devamma	30	24weeks	16007	G2	SPVD	32 weeks	ASD	1st pregnancy	Uncorrected	-	-	IUGR	2 hrs	SPVD	-	"
44	Lalitha	20	28weeks	10571	G1	-	TG	VSD	1st pregnancy	Uncorrected	-	URTI, Anaemia	-	10 hrs	SPVD	-	"
45	Uma Rani	19	24 weeks	11270	G1	-	TG	VSD	1st pregnancy	Uncorrected	-	-	-	-	discharge	-	"
46	Parvatamma	24	32 weeks	12183	G1	-	TG	ASD	1st pregnancy	Corrected	~12 Y	Epileptic	IUGR	8 hrs	SPVD	-	"
47	Nagamani	20	30 weeks	12017	G1	-	TG	IR	Childhood	Uncorrected	-	Anaemia	IUGR	6 hrs	SPVD	Reduced fetal movements	"
48	Sowjanya	19	32weeks	11270	G1	-	TG	PDA	Childhood	Uncorrected	-	-	-	-	LSCS	-	"
49	Arcefa	23	30weeks	12180	G1	-	TG	AR	Childhood	Uncorrected	-	-	-	8 hrs	SPVD	-	"
50	Noorjahan	20	32weeks	19926	G1	-	TG	AR	1st pregnancy	Uncorrected	-	-	-	9 hrs	SPVD	-	"
51	Velamma	24	28 weeks	2366	G1	-	TG	IR	childhood	Uncorrected	-	-	-	-	Discharge	-	"
52	Meher	23	30weeks	16127	G1	-	TG	ASD	1st pregnancy	Uncorrected	14-16 Y	-	-	10 hrs	SPVD	-	"
53	Fouzia	21	31 weeks	18922	G1	-	32 weeks	ASD	childhood	Corrected	~12 Y	-	-	10 hrs	SPVD	-	"
54	Pushpa	22	28 weeks	22416	G1	-	TG	ASD	1st pregnancy	Uncorrected	-	-	-	>12 hrs	Outlet	-	"
55	Renuka	21	32 weeks	15652	G1	-	TG	ASD	childhood	Uncorrected	-	PIH	-	14 hrs (>12 hrs)	Outlet forceps	-	"

Oligo* Oligohydramnious

Table 1 is showing patients with type of lesion and obstetrics outcome.

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III. RESULTS AND DISCUSSIONS

In the present study pregnant cardiac patients are 177 and pregnant patients with congenital heart disease are 55. Five cases are discharged and delivered elsewhere, so only obstetric management of fifty cases was analyzed. The decreased incidence in late age groups could be attributed to decreased fecundity, effective family planning programme and also due to completion of child bearing at an early age group in women with congenital heart disease. In present study most of the patients are primes 42%. In most of the cases lesion was diagnosed in childhood 40%. When the lesion was looked at ASD stands at top. Sixteen cases of ASD and one case of ASD + PS was encountered in present study.

Nine cases of ASD were operated. Next VSD stands in the queue. Eleven cases were present in the study. In the present study out of fifty cases, twenty cases had medical complications out of which the commonest complication was nutritional anemia. One of the causes of nutritional anaemia is low socio-economic group of patients. The other medical complications were upper respiratory tract infection (6 cases), pyrexia (1 case), bronchitis (1 case) epilepsy (1 case) and non-ischemic chest pain which were treated. Out of the fifty patients who delivered eleven patients had history of previous LSCS, IUGR (7 cases), oligohydramnious, abnormal Doppler (1 case), low lying placenta (1 case).

In present study twenty four patients were diagnosed to have congenital heart disease in childhood and fourteen cases were operated. This is because of advances in surgical and medical therapy which has taken place over 30 years which means that more affected women are surviving into reproductive age as cardiac surgery and medical management was revolutionized. As a boon the women with cardiac disease are becoming pregnant and enjoying the motherhood which was a nightmare in the past. The patients were managed in intrapartum and postpartum period and early ambulation was advised to prevent deep vein thrombosis.

IV. CONCLUSION

1. Incidence of Heart Disease complicating pregnancy is about 1% of all pregnancies.
2. Congenital heart disease is now more prevalent than acquired heart disease in pregnancy in the developed countries.
3. In India, the incidence of Rheumatic heart disease continues to be more.
4. Reported incidence of congenital heart disease with pregnancy varies between 0.2% - 19%.
5. In India 90% were acyanotic lesions, commonest are septal defects, PDA and others come next.
6. Pulmonary arterial hypertension, shunt reversal, functional capacity of the heart and other complications that increase the cardiac load, previous history of cardiac failure and arrhythmia, quality of medical care provided, psychological and socio-economic status.
7. Women with pre-existing cardiac lesions should receive preconception counseling including maternal and fetal risk during pregnancy and contraception.
8. Abortion, preterm delivery, IUGR is high in pregnancies with cyanotic heart disease.
9. Bacterial endocarditis prophylaxis should be given to VSD (Ventricular septal defect), PDA (Patent ductus arteriosus) (not necessary if operated in less than 6 months) in ASD (Atrial septal defect) under certain conditions.
10. 2-4% babies carry the risk of having congenital heart disease. Risk is much greater if the mother is affected than the father.

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