Original Article

Planned Versus Emergency Termination of Pregnancy in Cardiac Patients at Mansoura University Hospital

Kholoud Abdulmajied Elmogy, Mohamed Abdellatif El Negeri, Reda Abdelhadi Hemida, Ahmed Elawady Ahmed, Mohamed Elsayed Taman

Department of Obstetrics and Gynecology, Faculty of Medicine, Mansoura University, Egypt.

ABSTRACT

Background: Emergency interventions, done under unstable conditions, raise risks for both mother and baby. In contrast, planned interventions in controlled settings lead to better outcomes and fewer complications.

Aim: The aim of this work was to compare maternal and fetal outcomes of (planned VS emergent termination pregnancy outcome in women with pre-existing heart disease at Mansoura university hospitals.

Methods: This prospective cohort study was carried out on 50 pregnant women aged from 20 to 39 years old, with gestational age of medico legal viability 26 weeks, congenital heart disease {atrial septal defect (ASD), tetralogy of Fallot (TOF), ventricular septal defect (VSD)}, acquired heart disease e.g. (coronary artery disease, rheumatic heart disease, and prosthetics heart valves).

Results: Gestational age at delivery, hemoglobin (Hb) before and Hb after were significantly lower in group A than group B Blood loss, blood and plasma transfusion significantly higher in group A than B (*P* value <0.05). Total hospital stays, duration of intensive care unit admission, post operative mobilization and maternal mortality were significantly higher in group A than group B (*P* value <0.05). Baby weight and discharge rates were significantly lower in group A than group B (*P* value <0.001 and = 0.025 respectively). Fetal Echo was significantly different between both groups (*P* value = 0.03).

Conclusion: Emergency termination in maternal cardiac disease leads to worse outcomes, including longer recovery and prolonged hospitals stay, more blood loss, higher maternal mortality, and poorer fetal health. Multidisciplinary planning is crucial to improve results.

Key Words: Caesarean delivery, cardiac patients, congenital heart disease, planned versus emergency termination.

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Corresponding Author: Kholoud Abdulmajied Elsaid Elmogy, Department of Obstetrics and Gynecology, Faculty of Medicine, Mansoura University, Egypt, **Tel.:** +01129162799-01011643050, **E-mail:** drkholoudelmogy@gmail.com

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INTRODUCTION

Cardiovascular disease (CVD) complicates approximately 1–4% of pregnancies. The incidence is increasing as more women with congenital heart disease (CHD) survive to reproductive age, alongside advancing maternal age and a higher prevalence of risk factors such as hypertension, diabetes mellitus and multifetal gestations[1].

Although many women with cardiac conditions can achieve a successful pregnancy with appropriate monitoring and management, certain high-risk lesions remain associated with considerable maternal morbidity and even mortality[1].

Pregnancy imposes major hemodynamic changes, which can be poorly tolerated in women with underlying congenital lesions. While maternal mortality is relatively uncommon, adverse maternal and neonatal outcomes are reported with much greater frequency[2].

Cesarean section (CS) use in women with cardiac disease varies widely across registries, ranging from 21% to 55%[3].

Most expert recommendations favor vaginal delivery in women with preserved cardiac function; however, cesarean delivery may be the safer alternative in selected high-risk patients[4]

. According to the European Society of Cardiology guidelines, cesarean delivery is specifically indicated in women with Marfan syndrome and an aortic diameter >45mm, those with acute or chronic aortic dissection, severe intractable heart failure, or women requiring oral anticoagulation who enter preterm labor[4].

Reported CS rates among women with heart disease remain consistently higher than in the general obstetric population[5], largely due to concerns regarding the potential risks of emergency CS[6].

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However, there remains a significant risk associated with pregnancy in women with pre-existing heart disease, particularly when complications arise. Some women experience deteriorating cardiac function during pregnancy, potentially necessitating emergency pregnancy termination. The timing-planned versus emergent-greatly influences maternal and fetal outcomes[7,8].

Guidelines generally recommend planned deliveries in women with stable cardiac function; emergency cesarean sections are reserved for immediate health threats to mother or fetus[8].

The choice between planned and emergency pregnancy termination critically determines outcomes. Emergency interventions typically occur under urgent, unstable conditions, increasing maternal and fetal risks such as hemorrhage, infection, and neonatal morbidity[9,10].

Conversely, planned interventions, executed in controlled settings with adequate preparation, generally lead to improved outcomes, including reduced maternal and neonatal complications[10,11].

The aim of this work was to compare maternal & fetal outcomes of (planned VS emergent termination pregnancy outcome in women with pre-existing heart disease at Mansoura university hospitals.

PATIENTS AND METHODS

This prospective cohort study was carried out on 50 pregnant women with gestational age of medico legal viability 26 weeks, CHD (ASD, atrioventricular septal defect, COA, TOF, VSD) and acquired heart disease e.g. (Ischemic coronary HT disease, rheumatic heart disease, diseases of the pulmonary& aortic vessels, diseases of heart structure, and prosthetics valves replacement), aged from 20 to 39 years old.

The study was conducted from May 2023 to May 2024 after approval from the scientific and research Ethics Committee, Mansoura university, Mansoura, Egypt. An informed written consent was obtained from the from all participants.

The exclusion criteria were pregnant patients with age of gestation less than 26 weeks and with medical disorder e.g. (diabetes, hypo or hyperthyroidism, renal disease, hepatic disorders, and hematological diseases).

All participants underwent for complete history taking, general, cardiac, radiological examinations (Echo and ECG), laboratory testing [(CBC), renal& liver function tests and international normalized ratio (INR)] and fetal Ultrasonographic assessment [fetal biometry, placental assessment, amniotic fluid index (AFI) and biophysical profile (BPP)].

Echocardiography (Echo):

All enrolled participants underwent Echocardiography as part of their cardiac evaluation. Echo was performed by a certified cardiologist or trained sonographer[12].

Electrocardiogram (ECG):

The conventional 12-lead ECG were used.

Fetal Ultrasonographic Assessment:

Fetal biometry

Standard fetal biometric measurements were obtained to assess fetal growth and estimate gestational age, including: Biparietal Diameter (BPD), head circumference(HC), abdominal circumference, and femur length.

Estimation of fetal weight was calculated using the Hadlock formula based on these parameters.

Placental Assessment of Location: Anterior, posterior, or low-lying.

Maturity/Grading: Based on the Grannum classification (Grade 0 to III).

Morphology: detect abnormalities such as placental lakes, hematomas.

AFI

The amniotic fluid index was quantified through the four-quadrant method to calculate the AFI: Normal: 8–24 cm. o Oligohydramnios: AFI <5cm. o Polyhydramnios: AF >24cm.

BPP

A standard biophysical profile score (maximum 8 or 10 depending on inclusion of non-stress test (NST) was used to assess fetal well-being, with the following components evaluated over half an hour of fetal observation.

Movements of Fetal breathing (≥1breath lasting ≥ half minute). Whole fetal movements (≥3 discrete body/limb movements). The tone of fetus (occurrence of one or more extension with return to flexion).

Amniotic fluid volume (as described above).

NST included, assesses fetal heart rate reactivity.

Each component was scored as 0 (absent) or 2 (present/normal), with a total score of:

8–10: Normal. 6: Equivocal, may require repeat or further testing. o ≤4: Abnormal, usually indicates need for intervention.

Timing and mode of delivery:

Delivery was conducted at completed 37wks of gestation unless complications occurred delivery was earlier following enhancement of fetal lung maturity with single course of corticosteroids.

The mode of delivery was according to general obstetric indication. Intraoperative assessment: Both groups of those who delivered at the planned time and those who underwent emergent delivery before planned time were assessed for: Type of anesthesia, operation time, estimated blood loss, number of blood product units transmitted.

The primary outcome was hospital stay duration defined as period starts from admission including pre and post-delivery observation time, delivery period and intensive care unit (if admitted) to time of discharge.

The Secondary outcomes were; the occurrence of postpartum hemorrhage (PPH), ICU admission rates and duration, mortality rates, time of start of early mobilization after delivery, vital signs of the patient (Blood pressure, pulse, temperature, urine output), newborn assessment including APGAR score at 1 and 5 minutes-baby measurements (length, weight and HC) and take-home baby rates.

Sample Size Calculation:

Sample size calculation was based on the outcome of elective and planned CS among cardiac cases retrieved from previous research[3]. Using G power program version 3.1.9.4 to calculate sample size based on expected difference of 40% of fetal with low APGAR score, using 2-tailed test, α error= 0.05 and power= 80.0%, the total calculated sample size was 25 in each group at least.

Statistical Analysis:

Statistical analysis was done by SPSS v26 (IBM Inc., Chicago, IL, USA). Shapiro-Wilks test and histograms were used to evaluate the normality of the distribution of data. Quantitative parametric variables were presented as mean and standard deviation (SD) and compared between the two groups utilizing unpaired Student's *T*-test. Quantitative non-parametric data were presented as median and interquartile range (IQR) and were analyzed by Mann-Whitney test. Qualitative variables were presented as frequency and percentage and were analyzed utilizing the Chi-square test or Fisher's exact test when appropriate. A two tailed *P* value ≤0.05 was considered statistically significant.

RESULTS

The In this study, 60 patients were assessed for eligibility; 10 patients did not meet the criteria, and 0 patients refused to participate in the study. The remaining patients were randomly allocated into two equal groups (25 patients in each). All allocated patients were followed up and analyzed statistically (Figure 1).

There is statistically Insignificantly different between both groups according: Demographic characters and clinical baseline characteristics of the studied groups (Table1).

There is no significant difference between both groups regarding type of cardiac condition. There is no significant difference between both groups as regards echocardiographic finding and other cardiac investigation done preoperatively (Table 2).

There is no significant difference between both groups in the New York heart association (NYHA) class at time of admission (Table 3).

Gestational age at delivery, hemoglobin (Hb) before and Hb after were significantly lower in group A than group B Blood loss, blood & plasma transfusion significantly higher in group A than B (*P* value <0.05). Total hospital stays, duration of ICU admission, post operative mobilization and maternal mortality were significantly higher in group A than group B (*P* value <0.05)(Table 4).

Baby weight and discharge rates were significantly lower in group A than group B (*P* value <0.001 and= 0.025 respectively). Fetal Echo was significantly different between both groups (*P* value= 0.03) (Table 5).

Table 1: Demographic characters and clinical baseline characteristics of the studied groups:

			Group A (n= 25)	Group B (n= 25)	Test of significance
Age (years)			30.68±6.67	27.44±6.94	t=1.68 p=0.099
Residence	Urban		17(68%)	13(52%)	χ^2=1.33 P=0.248
	Rural		8(32%)	12(48%)	
Previous cardiac intervention	Open heart		5(38.5%)	6(42.9%)	
	Mitral valve ballon dilatation		2(15.4%)	0	P=0.500 χ^2=0.199
	Cardiac catheterization		2(15.4%)	3(21.4%)	
	Not done		16(78.8%)	16(78.8%)	
Gestational age at admission (weeks)			36.12±2.33	36.68±1.70	t=0.970 P=0.337
Gravidity			3(1-8)	2(1-5)	Z=1.42 P=0.154
Parity			2(0-4)	1(0-3)	Z=1.12 P=0.264
FTND			0(0-4)	0(0-3)	Z=1.06 P=0.290
Number of previous CS			1(0-3)	1(0-3)	Z=0.355 P=0.723
Abortion		No	17(68%)	14(56%)	
First trimester		6(24%)	6(24%)		Mc=0.01 P=0.995
Second trimester		2(8%)	5(20%)		

Data are presented as Mean±SD, Frequency (%); Z: Mann Whitney U test; FET: Fisher exact test; t: Student t test; *: Statistically significant; MC: Monte Carlo test; FTND: Full-term normal delivery; CS: Caesarean section.

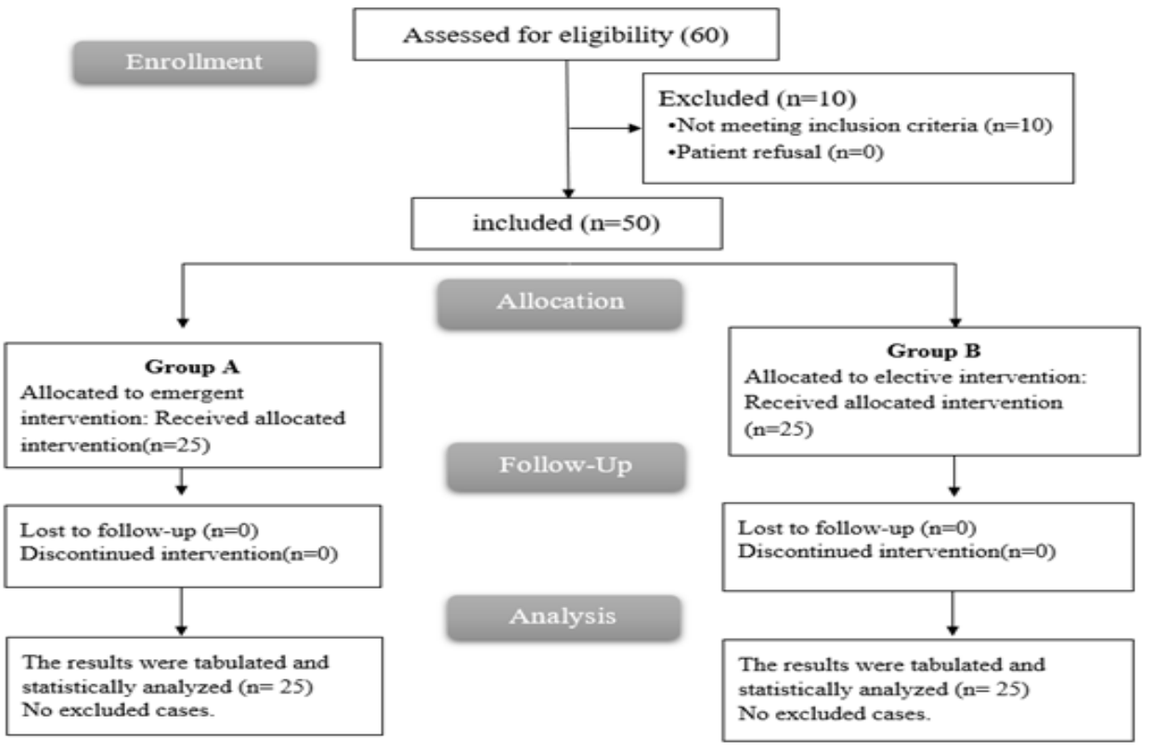

Fig. 1: Consort Flow chart showing study design.

Table 2: Type of cardiac condition, echocardiographic findings and other cardiac investigations of the studied groups:

		Group A (*n*= 25)	Group B (*n*= 25)	Test of significance
Type of cardiac condition	Congenital	1(4%)	3(12%)	$\chi 2$= 4.4 *p*= 0.623
	Rheumatic	17(68%)	16(64%)	
	Ischemic H diseases	(0)	2(8%)	
	Dilated cardiomyopathy	4(16%)	1(4%)	
	Arrhythmia	1(4%)	2(8%)	
	Surgical corrected cardiac condition	2(8%)	1(4%)	
Echo AT time of admission				
Aortic valve lesion	Prosthetic aorta v	1(4%)	1(4%)	*P*= 1.0
	Aortic stenosis	0	1(4%)	*P*= 1.0
	Aortic v. regurge	4(16%)	1(4%)	*P*= 0.349
	P. HTN	5(20%)	3(12%)	*P*= 0.440
Pulmonary valve affection	Pulmonary. v regurge	0	1 (4%)	*P*= 1.0
	Pulmonary V stenosis	1(4%)	3(12%)	*P*= 0.349
	Mitral stenosis	2(8%)	1(4%)	*P*= 1.0
Mitral valve affection	Mitral V regurge	13(52%)	14(56%)	*P*= 1.0
	prosthetic mitral v	1(4%)	0	*P*= 1.0
Tricuspid valve affection	Tricuspid V regurge	11(44%)	11(44%)	---
Cardiomyopathy		4(16%)	1(4%)	$\chi 2$FET=2.0 *P*=0.349
EF %		60.84±10.68	63.72±8.71	*t*= 1.05 *p*=0.301
Others finding	ASD COR Pulmonal	2(8%)	0	$\chi 2$= 10.1 *P*= 0.258
	Double inlet LT ventricle	0	1(4%)	
	TGA+VSD	0	1(4%)	
	atherosclerotic coronary	0	2(8%)	
	ASD	0	1(4%)	
ECG	not done	24(96%)	23(92)	$\chi 2$= 4.08 *P*= 0.252
	tachycardia	0	2(8%)	
	Atrial flutters	1(4%)	0	

Data are presented as Frequency (%); $\chi 2$: Chi-Square test; HTN: Hypertension; EF: Ejection fraction; ASD: Atrial septal defect; TGA: Transposition of the great arteries; VSD: Ventricular septal defect.

Table 3: NYHA classification at time of admission of the studied groups:

		Group A (*n*= 25)	Group B (*n*= 25)	Test of significance
NYHA class at time of admission	I	1 (4%)	0	χ^2=2.09 *p*=0.553
	II	16 (64%)	17(68%)	
	III	7 (28%)	8(32%)	
	IV	1 (4%)	0	

Data are presented as Frequency (%), $\chi 2$=Chi-Square test; *statistically significant, NYHA: New York heart association.

Table 4: Comparison of operative characters and post-delivery maternal outcomes of the studied groups:

			Group A (*n*= 25)	Group B (*n*= 25)	Test of significance
Mode of delivery	Vaginal		3(12%)	2(8%)	FET=0.222 *P*=1.0
	Cesarean		22(88%)	23(92%)	
Gestational age at delivery (weeks)			36.08±2.33	37.40±1.41	*t*=2.42 *P*= 0.019*
Type of anesthesia	No need		3(12%)	1(4%)	Z=1.42 *P*=0.700
	Spinal		12(48%)	15(60%)	
	Epidural		6(24%)	5(20%)	
	Spinal + epidural		4(16%)	4(16%)	
Post operative analgesia	No need		1(4%)	0	MC= 2.81 *P*= 0.832
	Paracetamol		7(28%)	9(36%)	
	Paracetamol-NSAIDS		7(28%)	9(36%)	
	Nalophine		3(12%)	2(8%)	
	Nalophine+ paracetamol		1(4%)	1(4%)	
	Nalophine+ fentanyl		5(20%)	4(16%)	
	Dormicum		1(4%)	0	
Duration of operation (minutes)			80(55-240)	80(50-210)	Z= 0.441(*P*= 0.659)
blood loss (mm)			534±99.71	323.2±89.89	*t*= 7.85 (*P*< 0.001*)
Hb before			9.9±0.56	10.38±0.47	*t*= 3.23 (*P*= 0.002*)
Hb after			8.92±0.59	9.67±0.35	*t*= 5.02 (*P*<0.001*)
Blood & plasma transfusion		0	5(20%)	17(68%)	Mc= 13.8 *P*= 0.007*
	1	10 (40%)	6 (24%)		
	2	5 (20%)	2 (8%)		
	3	3 (12%)	0		
	5	2 (8%)	0		
Blood units			*n*= 20	*n*= 8	FET= 0.004 *P*= 1
		1	15(75%)	6(75%)	
	2	5(25%)	2(25%)		
Plasma units			*n*= 11	*n*=4	MC= 0.8 *P*= 0.653
		1	8(72.73%)	2(50%)	
	2	2 (18.18%)	1(25%)		
	3	1 (9.09%)	1 (25%)		
Post-delivery maternal outcomes					
Total hospital stays (days)			5(4-15)	3(2-6)	Z= 0.564 P<0.001*
Duration of ICU admission			5(3-15)	2(2-3)	Z= 0.512 P<0.001*
Post operative early ambulation (hours)			12(6-24) #	6(6-12)	Z= 0.356 P<0.001*
Post operative complications		+VE	18(72%)	23(92%)	FET= 0.421 *P*= 0.138
-VE 7 (28%)		2(8%)			
Mortality rate			1(4%)	0(0%)	*P*= 0.009*

Data are presented as Frequency (%); Mean±SD; #: one case comatose; Z: Mann Whitney *U* test; *t*: Student *t* test; FET: Fisher exact test; MC: Monte Carlo test; *: Statistically significant as *p* value <0.05; Hb: Hemoglobin; NSAIDS: Non-steroidal anti-inflammatory drugs; ICU: Intensive care unit.

Table 5: Comparison of fetal outcome of the studied groups:

		Group A (*n*= 25)	Group B (*n*= 25)	Test of significance
APGAR score at 1 minute		7.48±1.71	8.08±1.15	*t*= 1.45 *p*= 0.152
APGAR score at 5 minutes		8.08±1.52	8.21±1.44	*t*= 0.302 *p* =0.764
Baby weight (gm)		2758±441.04	3158±353.46	*t*= 3.53 *P* <0.001*
Discharge	Take home baby	14(56%)	22(88%)	χ^2= 2.12 *P*= 0.025*
	NICU	11 (44%)	3(12%)	
Neonatal echocardiography	Normal	14(56%)	21(84%)	$\chi 2$= 15.45 *P*= 0.03*
	VSD	0	2(8%)	
	TOF	2(8%)	0	
	TGA	3(12%)	0	
	MS	2(8%)	1(4%)	
	AVSD	2(8%)	0	
	ASD	2(8%)	1(4%)	

Data are presented as Frequency (%); Mean±SD; *t*: Student t test; $\chi 2$: Chi-Square test; FET: Fisher exact test; *Statistically significant; NICU: Neonatal intensive care unit; VSD: Ventricular septal defect; TOF: Tetralogy of Fallot; TGA: Transposition of the great arteries; MS: Mitral stenosis; AVSD: Atrioventricular septal defect; ASD: Atrial septal defect.

DISCUSSION

CVD has emerged as a leading cause of maternal mortality. It is estimated that 17.2% of women aged 20–39 years have underlying CVD that can complicate pregnancies and lead to increased morbidity and mortality[13-14]. In the present study, the median value of total hospital stay was 5 days (4-15) in group A and 3 days (2-6) in group B. The median value of duration of ICU admission was 5 days (3-15) in group A and 2 days (2-3) in group B. Total hospital stay and duration of ICU admission, were significantly higher in group A than group B (*P* value <0.05).

These prolonged admissions likely from the increased perioperative instability and the complexity of post-operative recovery following emergent interventions. The need for closer monitoring, management of complications, and delayed stabilization collectively contribute to these extended hospital and ICU durations.

Tsaitlin-Mor *et al*.,[18] compared pregnant individuals with cardiac disease to matched controls and reported maternal ICU admission in 13 women (7.3%) in the exposed group versus 2(0.6%) among controls (*p*<001).

Lipczyńska *et al*., [19] evaluated pregnancies complicated by CVD requiring non-elective cardiac hospitalization and found that 25 pregnancies (17.8%) necessitated more than one admission, while cardiovascular events occurred during 62 non-elective admissions (44%).

Kirkegaard *et al*.,[20] demonstrated that women with (CHD) experience longer postpartum hospitalizations than those without CHD, with increasing CHD complexity associated with progressively longer stays: 3.9 (SD 4.4), 4.0 (SD 3.8), and 5.1 (SD 6.7) days for simple, moderate, and complex CHD, respectively, versus 3.6 (SD 3.7) days in women without CHD. Cesarean birth was associated with an average 2.7-day longer admission than vaginal delivery.

Schlichting *et al*.,[21] reported that, at delivery, women with CHD had longer hospital stays and incurred higher total charges compared with women without CHD.

In this study, there were no statistically significant differences between groups in demographic or baseline clinical features. The mean (±SD) maternal age was 30.68±6.67 years in group A and 27.44±6.94 years in group B. The mean gestational age at admission was 36 weeks in both groups. Median gravidity was 3 in group A versus 2 in group B, and median parity was 2 versus 1.

Yasmeen *et al*.,[25] reported that 25 patients (62.5%) were aged 21–25 years and were primigravidae, whereas 15 patients (37.5%) were 30–35 years and mostly multigravidae (75%).

Ruys *et al*.,(136) observed a median maternal age of 30 years (SD 5.6; range 16–53) and noted that nulliparity was less frequent in the planned caesarean section subgroup at baseline.

With respect to underlying cardiac diagnoses in our study, there is insignificant difference between groups. Rheumatic heart disease (RHD) predominated in both cohorts (68% in group A and 64% in group B). Dilated cardiomyopathy accounted for 16% in group A versus 4%

in group B, while CHD, IHD, arrhythmias, and surgically corrected lesions were present at lower frequencies in both groups.

Tsaitlin-Mor *et al*.,[18], most women had acquired disease (valvular *n*= 69; arrhythmia *n*= 31; cardiomyopathy *n*= 3), with 9 women having congenital lesions.

Functional status at admission was also comparable between groups with no statistically difference. NYHA class II predominated (64% in group A; 68% in group B); class III comprised 28% versus 32%, while classes I and IV were infrequent and observed only in group A.

Roos-Hesselink *et al*.,[17] reported 72% in NYHA I, and Ruys *et al*., (136) noted worse baseline NYHA status among women scheduled for cardiac-indicated planned caesarean section. In Yasmeen *et al*.,[25], 75% were NYHA I and 7.5% were NYHA IV.

In our cohort, cesarean delivery predominated in both groups: 88% in group A and 92% in group B, with vaginal birth occurring in 12% and 8%, respectively. The distribution did not differ significantly between groups (*P*= 1.0).

Roos-Hesselink *et al*.,[17] documented a cesarean section (CS) rate of 41% among women with cardiac disease (23% in the general population), of which 393 were planned (including 53 that became emergency CS) and 141 were emergency CS after a planned vaginal birth. Assisted vaginal birth (forceps or vacuum) occurred in 32% of vaginal deliveries.

Yasmeen *et al*.,[25] reported a predominantly vaginal delivery pattern (62.5%), with lower CS utilization (35%).

The mean gestational age at delivery was significantly lower in group A than in group B (36.08±2.33 vs. 37.40±1.41 weeks; $p<0.05$). Preoperative hemoglobin concentrations were also lower in group A (9.90±0.56g/dL) compared with group B (10.38±0.47g/dL), and postoperative hemoglobin remained lower in group A (8.92±0.59vs. 9.67±0.35g/dL). These differences reached statistical significance.

Estimated blood loss (EBL) was substantially higher in the emergency group: mean EBL was 534±99.71mL in group A versus 323.2±89.89mL in group B ($P<0.05$). Consistent with the greater blood loss, transfusion of blood products occurred more frequently in group A ($P<0.05$). The increased hemorrhagic burden and transfusion requirement in the emergency cohort likely reflect the hemodynamic instability and technically more demanding operative conditions that accompany urgent interventions.

Lipczyńska *et al*.,[19] observed a lower median gestational age in pregnancies complicated by cardiac events compared with uncomplicated pregnancies (median 33.5 vs.39 weeks; $P<0.001$).

Chong *et al*.,[23] found no significant difference in EBL between women with cardiac disease and controls, The adjusted average blood losses were 247.2ml, 241.8ml and 295.9ml in the control group, respectively ($p= 0.165$.).suggests that women with CD have comparable EBL to low risk women.

Postoperative recovery profiles differed significantly between the two groups. Median time to early ambulation was longer in group A at 12 hours (range 6–24) compared with 6 hours (range 6–12) in group B ($P<0.05$). This delay may be explained by greater perioperative instability and the need for more intensive postoperative monitoring in the emergency cohort.

Maternal mortality occurred in one patient in group A, whereas no deaths were reported in group B ($P<0.05$). Although postoperative complications were more frequently observed in group A, these differences did not reach statistical significance

Tummala *et al*.,[24] further demonstrated that women with valvular heart disease(VHD) had higher incidences of congestive heart failure (38% vs. 0%; $p<0.00001$), arrhythmias (15% vs. 0%; $p= 0.002$), and rehospitalization (35% vs. 2%; $p<0.0001$).

Khanna *et al*.,[22] reported maternal adverse events in 42.5% of their patients, including one maternal death (1.2%).

Lipczyńska *et al*.,[19] observed maternal cardiac events in 44% of pregnancies, with 3 maternal deaths (2.1%).

Neonatal outcomes were less favorable in the emergency group. Apgar scores at 1 and 5 minutes did not differ significantly between groups; however, mean birth weight was significantly lower in group A compared with group B (2758±441.04g vs. 3158±353.46g; $P<0.05$). Fewer neonates from group A were discharged home directly (56% vs. 88%), and a larger proportion required NICU admission (44% vs. 12%). Abnormal fetal echocardiographic findings were more frequent in group A (11 cases) than in group B (4 cases), a difference that reached statistical significance.

These adverse neonatal outcomes likely relate to the earlier gestational age at delivery and the compromised intrauterine environment associated with maternal cardiovascular instability.

Tummala *et al*.,[24] found that (VHD) was associated with increased rates of preterm delivery (23% vs.6%; $P= 0.03$), intrauterine growth restriction (21% vs. 0%; $P<0.0001$), and lower birth weight (2897±838g vs. 3366±515g; $P= 0.0003$).

Khanna *et al*.,[22] observed a 23.7% preterm delivery rate and a high frequency of low-birth-weight infants (53.7%), with one intrauterine death.

Lipczyńska *et al*.,[19] reported lower Apgar scores and a lower median gestational age among neonates whose mothers experienced cardiac complications (mean Apgar 8.5±1.7 vs. 9.98±0.4; median gestational age 33.5 vs. 39 weeks; P= 0.001 and P<0.001, respectively).

Limitations of the study included that the relatively small number of participants (n= 50). Conducted exclusively at Mansoura University Hospitals, which may limit the applicability of results to different healthcare settings. The study focused only on immediate maternal and fetal outcomes without long-term follow-up.

CONCLUSION

Emergency termination was associated with significantly prolonged hospitals stay period (including operation time, post operative hospital stay, prolonged ICU admission period, delayed postoperative early ambulation) and other poor maternal outcomes (including lower hemoglobin levels, increased blood loss, blood product transfusion rate and higher maternal mortality). Furthermore, neonatal outcomes were less favorable in the emergent group, evidenced by significantly lower birth weights, reduced rates of discharge, and abnormal fetal echocardiography findings. Highlighting that the clinical importance of multidisciplinary planning in managing pregnancies complicated by maternal cardiac disease to optimize both maternal and neonatal outcomes.

CONFLICT OF INTERESTS

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