Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/15141
DOI URL: http://dx.doi.org/10.21474/IJAR01/15141

RESEARCH ARTICLE

CARDIAC DISEASE IN PREGNANCY AND MATERNAL OUTCOME - A RETROSPECTIVE STUDY

Dr. Sowmya M., Dr. Sanjana Patil, Dr. Gayatri Bawagi and Dr. Neeta Harwal

Manuscript Info

Manuscript History
Received: 31 May 2022
Final Accepted: 30 June 2022
Published: July 2022

Key words:-
Cardiac Disease in Pregnancy, Pregnancy, Rheumatic Heart Disease (RHD), Congenital Heart Disease (CHD)

Abstract

Objectives : To evaluate the maternal outcomein patients with cardiac disease in pregnancy in terms of maternal complication and mode of delivery.

Materials And Methods : Medical records of 50 women with heart disease who delivered at >/= 28 weeks of gestation from March 2018 to February 2022 at Department of Obstetrics and Gynecology ,Basaweshwara Hospital ,attached to MahadevappaRampure Medical college ,Kalaburgi , were studied .

Results : The prevalence of heart disease in pregnancy was 1%.There were 6(12%) with congenital heart disease(CHD) and 36(72%) with rheumatic heart disease(RHD), other lesions were 8(16%).76% of the women from rural background , 24% of the women from urban background .Isolated Mitral Regurgitation(MR) was the most common defect in rheumatic heart disease , atrial septal defect is the most common congenital lesion seen.64% of women remained NYHA class I throughout pregnancy. Heart failure developed in 2 patients whose NYHA changed from I/II to III /IV .18 women underwent corrective procedures prior or during pregnancy had good outcome. The maternal mortality was 2%.The incidence of preterm labor was 8%. Majority of the women delivered by spontaneous vaginal delivery 18(36%) while 16(32%) had caesarean section ,14(28%) had instrumental vaginal delivery , 2(4%) had vaginal delivery after induction .

Conclusion: Cardiac disease is an important cause of maternal morbidity and mortality. Patients with NYHA class I/II had a better maternal outcome than those with NYHA class III/IV. Surgical correction of the cardiac lesion prior to pregnancy was associated with better pregnancy outcome.

Introduction:-

In developing countries like India,Cardiac diseases complicate 2% of pregnancies and contribute to about 1/5th of all the maternal deaths in India.[1] Pregnancy and the peripartum period are associated with important cardio circulatory changes that can lead to marked deterioration in the women with cardiac disease.[2]Cardiac disease in pregnancy is broadly divided into congenital and acquired.[3]In the Western world,with Congenital heart disease being most common cardiac disease in pregnancy of 75-82%, with decreasing incidence of rheumatic heart disease which is acquired group of cardiac disease ,Rheumatic valvular heart disease which is the most common cause in developing countries ,compromising 56%-89% of all cardiovascular diseases in pregnancy and other being Cardiomyopathies and ischemic heart disease (IHD)[4,5] .

Corresponding Author:- Dr. Sowmya M.

In developing countries, a large number of women become pregnant prior of seeking therapeutic intervention for cardiac lesions and many of them are only diagnosed with heart disease during pregnancy.[6] Detailed assessment of patient throughout pregnancy may lead to initial discovery of heart disease. If diagnosed early, and managed properly with multidisciplinary persective, collaboration of a team of experienced obstetricians, cardiologist, anaesthetist, pediatrician and nurse, it results in successful outcome for mother and child in majority of cases.[7] In women with normal reserve, Hemodynamic changes of normal pregnancy are well tolerated. However, decompensation occurs in compromised heart, with resultant increase in maternal morbidity and mortality. It is natural to expect that fetus will also be compromised in these mothers as fetal health depends upon adequate and continuous supply of well oxygenated maternal. [8]

A retrospective analysis of patients with cardiac disease in pregnancy was carried out from Medical records of 50 women with heart disease who delivered at >/= 28 weeks of gestation from March 2018 to February 2022 at Department of Obstetrics and Gynecology ,Basaweshwara Hospital ,attached to MahadevappaRampure Medical college ,Kalaburgi, which is a tertiary care teaching hospital in North Karnataka ,South India. The aim of this study was to evaluate women with heart disease complicating pregnancy, and identify (1) the etiology of heart disease complicating pregnancy; (2) antepartum, intrapartum and postpartum course of these women.

Materials And Methods:-

The medical records of 50 women who were admitted with heart disease and who delivered at >/= 28 weeks of gestation from March 2018 to February 2022 at Department of Obstetrics and Gynecology ,Basaweshwara Hospital ,attached to MahadevappaRampure Medical college ,Kalaburgi were identified as having a cardiac disorder complicating pregnancy.

These women were managed in the cardio obstetric clinic, under the care of an obstetrician and a cardiologist. They underwent thorough clinical examination, ECG and echocardiography. The demographic parameters of these women, such as the age, parity, socioeconomic status and occupation were noted.

Their clinical history, such as NYHA class at booking, gestational age at first visit, history of cardiac complications before pregnancy, cardiac medications and anticoagulation, prior history of cardiac surgery/interventions and nature of the cardiac lesion was recorded.

The details of the antenatal period, labor and delivery, postnatal course and complications were retrieved. The immediate perinatal outcome was also documented. Statistical analysis have been done using the SPSS software

Results:-

The total number of women who delivered at our institution between March 2018 to Febrauary 2022 was 3000.Of these 50 were diagnosed with cardiac disorders,giving prevalence of 1 %. There were 6(12%) with congenital heart disease and 36(72%) with rheumatic heart disease, other lesion were 8(16%).

The age of our patients ranged from 20yrs-39yrs,with the mean being 25.18 years. 32% of women were primigravida,68% were multigravidas.76% of the women were from rural background , 24% of the women were from urban background.56% of women belonged to lower class and 44% belonged to middle class.And the lower class women had more prevalence of rheumatic heart disease than middle class.20% of women were diagnosed with heart disease during pregnancy.The diagnosis was made either during routine clinical examination or suspicion due to symptoms such as shortness of breath,pedal edema.68% were NYHA class I/II when entered pregnancy ,64% of women remained NYHA class I/II through out pregnancy ,but 4% progresses to NYHA III/IV due to pregnancy or other precipitating factors. 24(42%) women required prophylaxis against spontaneous bacterial endocarditis,4(8%) women required anti coagulants, 22(44%) women required antifailure medications.

Table I shows the various conservative and surgical procedures which patient had undergone before or during pregnancy. 18 women underwent corrective procedures, tolerated pregnancy well

Table I:- Corrective Procedure :

Procedures done	No.
Per cutaneous transluminal coronary angioplasty(PTCA)	4

BallonValvuloplasty	2
Mitral Valve Replacement	1
Mitral Valve Repair	3
Atrial septal defect (ASD) Closure	2
VSD Closure	1
Both ASD and VSD Closure	1
BallonVulvuloplasty aortic	1
Pulmonary Valvulotomy	1
Tricuspid Valve Repair	2

32% of the women were primigravida ,68% of the women were multigravidas.92% delivered at term.The incidence of preterm labour was 8%.36% went into spontaneous labour , 4 % were induced and later went into labour ,28% had operative vaginal delivery requiring ventouse , for shortening of II stage of labour , 32% had Cesarean section , mainly for obstetric indications most common indication being Fetal distress (12%),previous LSCS(8%),CPD (4%),Oligohydrominos(4%), NRFHR(2%) and low lying placenta (2%).Sub arachnoid block was given in majority of patients 94%.General anesthesia was used only in 6% .Various obstetrical and medical co morbidities were observed as listed in Table 2 .

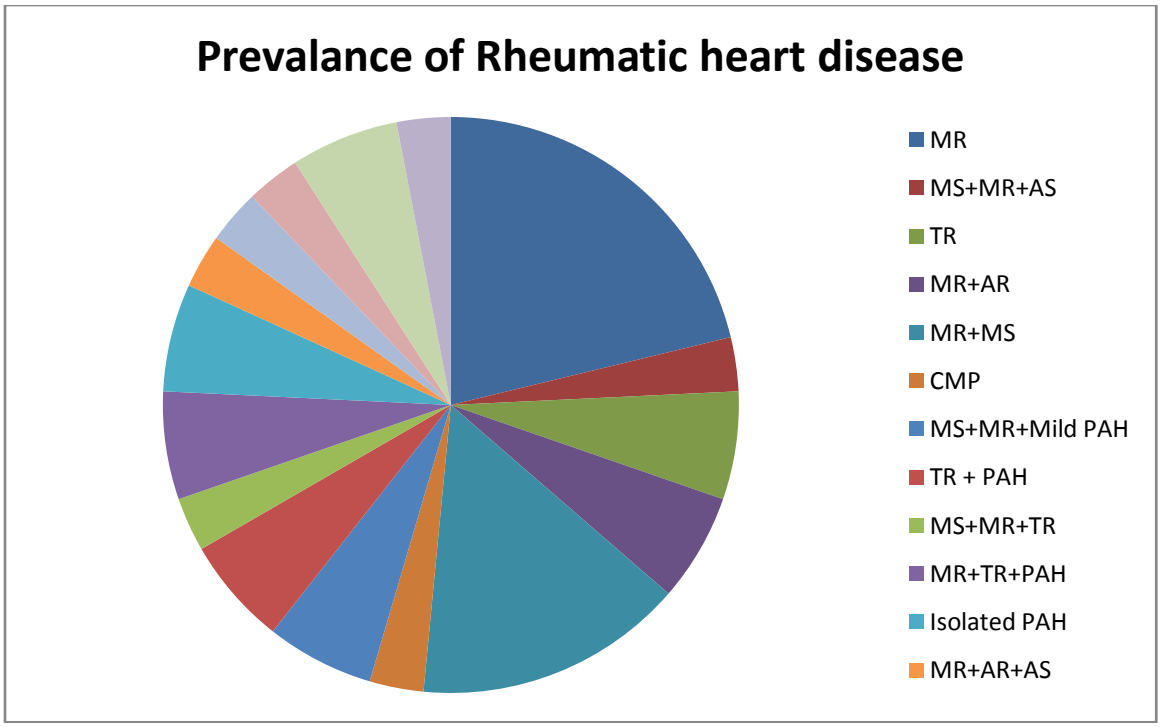
Table II:- Obstetrical and Medical Co morbidities.

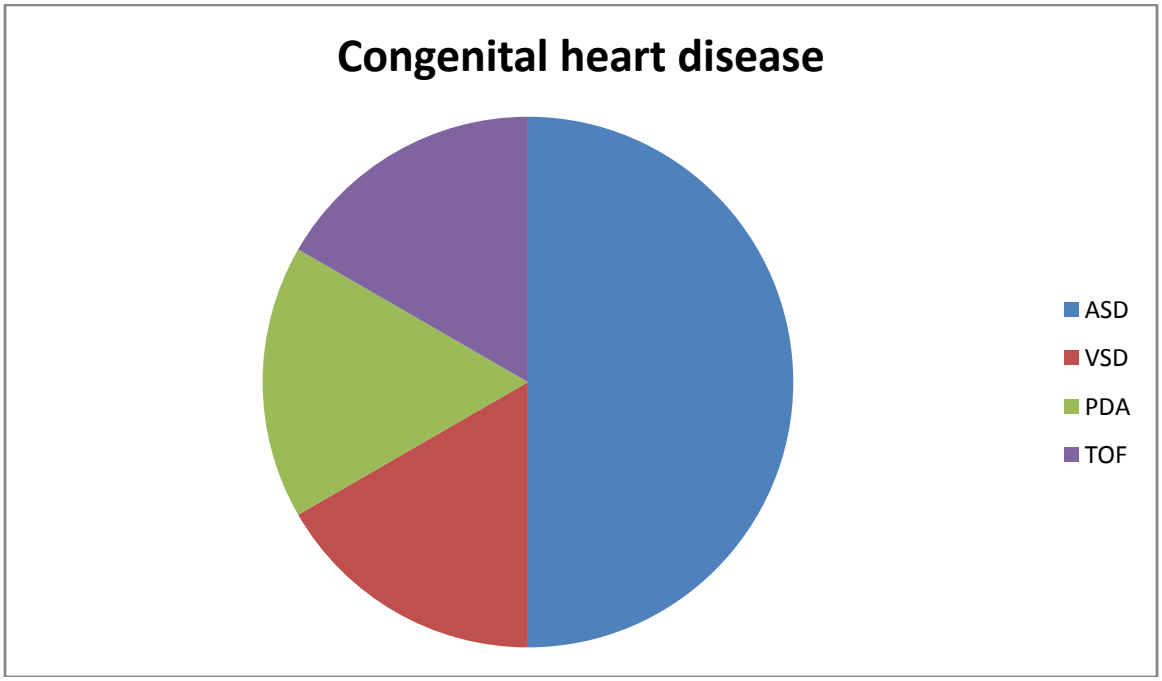
Obstetrical and Medical Co morbidities	No.
IUD	2
Pre Eclampsia	4
Eclampsia	1
Gestational HTN	6
Hypothyroidism	4
Anemia	4
PPROM	1
Threatened Pre term labor	2
Preterm labor	4
HELLP Syndrome	2

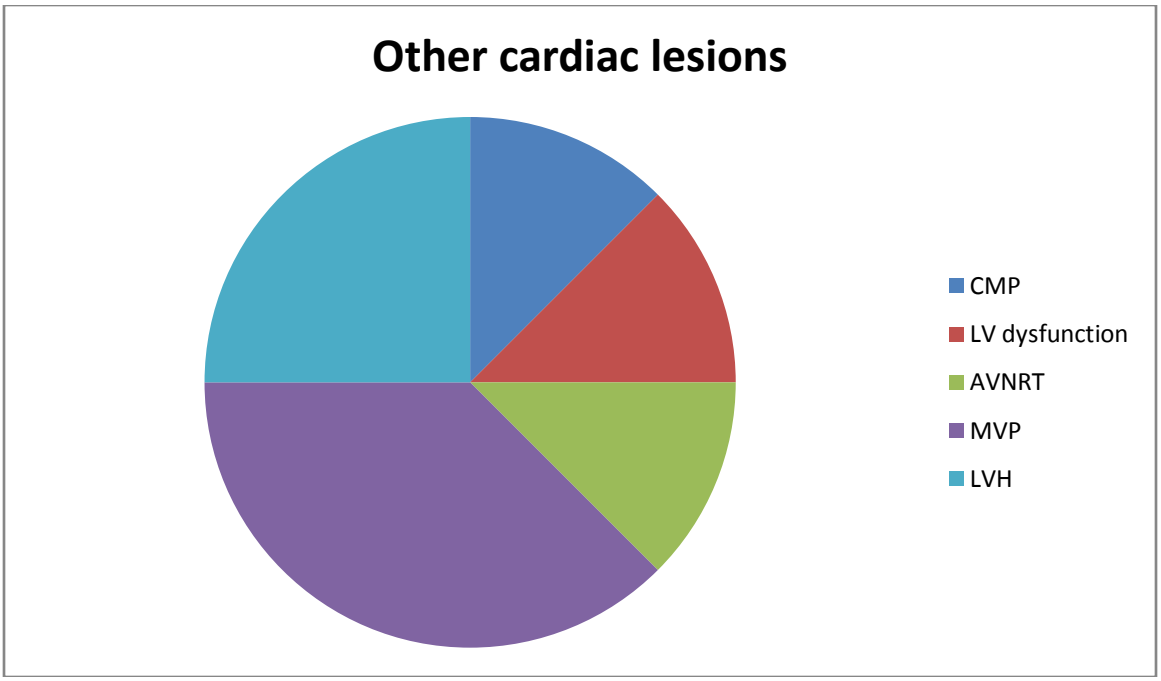
Although the maternal mortality was 2%,near miss events were high in the patients who required intensive care unit and ventilator support.

Table III:- Post partum Complications.

Post partum Complications	No.
ICU care	20
Ventilator	1
Mortality	1
Blood transfusion(Anemia)	4
TIA	0


Prevalance of Rheumatic heart disease
MR
MS+MR+AS
TR
MR+AR
MR+MS
CMP
MS+MR+Mild PAH
TR + PAH
MS+MR+TR
MR+TR+PAH
Isolated PAH
MR+AR+AS


Congenital heart disease
ASD
VSD
PDA
TOF



Discussion:-

Cardiac disease is a major complicating factor in pregnancy. Rheumatic heart disease continues to be a major problem in the developing world, whereas in the developed countries, congenital heart problems are more often encountered during pregnancy. In our study, the prevalence of heart disease in pregnancy was 2%; There were 6(12%) with congenital heart disease and 36(72%) with rheumatic heart disease, other lesion was 8(16%). The ratio of rheumatic to congenital heart disease was 6:1. Various earlier studies in India have reported ratios ranging from 3.2:1[9] to 8.3:1.17[10] . Our study depicts a decrease in incidence of rheumatic heart disease complicating pregnancy, which is the result of improved awareness and access to healthcare.

In patients with rheumatic heart disease, the mitral valve was the most commonly involved. Isolated mitral valve lesions; regurgitation were seen in 54% of our subjects. This was similar to the observations of Sheela et al.[11]

Among patients with congenital heart disease, septal defects were the most common. Atrial septal defect was seen in 50% of the women with congenital heart lesions. However, complications like shunt reversal and pulmonary hypertension were not commonly seen. The outcome of pregnancy was checked by the maternal heart function in the first trimester of pregnancy. NYHA class III and IV strongly forecasts an adverse maternal outcome. There were 1 maternal deaths (2%) encountered in our study.Severe Pulmonary hypertension leading to death due to complex physiological changes occurring during pregnancy and compromised right ventricular function and abnormal vasculature in these patients, Postpartum ICU admissions were needed in 20 women who had a poor functional status. Sawhney et al reported a maternal mortality rate of 2% in women with cardiac disease. They have studied 486 women with heart disease over a period of 13 years. Ten deaths were seen, of which 8 women (80%) were NYHA class III or IV.[12] 18(36%) women underwent corrective procedures prior or during pregnancy had good outcome , either surgical or minimally invasive, prior to or during pregnancy. The most commonly done procedure being Per cutaneous transluminal coronary angioplasty(PTCA). The European task force on the Management of Cardiovascular Diseases in Pregnancy also recommends surgical correction of the valve defect in rheumatic heart disease prior to pregnancy.[13] However, the longer time interval between valvotomy and pregnancy, more chance of cardiac failure. In developed countries, most patients with congenital heart disease undergo surgical correction in childhood. However, in developing countries, a significant number of patients are diagnosed with congenital heart disease for the first time during pregnancy. These women require careful conservative management, followed by surgery 8 -12 weeks post delivery. Several studies conducted showed that conservative cardiac surgery is safe in pregnancy, especially in the second and early third trimester. The most commonly done surgery during pregnancy has been percutaneous balloon commissurotomy.[14-16]

An adverse cardiac event was most likely to occur during labor and in the immediate post partum period. The most common cardiac complications are congestive heart failure and arrhythmias.[17,18]

They usually respond well to medical therapy. Advanced NYHA functional class and prior history of heart failure are the most important risk factors for an adverse cardiac event.Hence delivery was best carried out at a tertiary center with intensive care facilities and under the joint supervision of an obstetrician and cardiologist. [19]

Antibiotic prophylaxis against infective endocarditis was recommended in patients with moderate to severe valve lesions, and in those with significant shunts. [20]In patients who underwent vaginal delivery, instrumental delivery with ventouse preferred, in order to prevent maternal strain and exhaustion.In our study, the rate of instrumental delivery was 28%, as majority of the patients had a short second stage of labor, and delivered without assistance.32% had Cesarean section , mainly for obstetric indications most common indication being Fetal distress (12%),previous LSCS(8%),CPD (4%),Oligohydrominos(4%), NRFHR(2%) and low lying placenta (2%).Sub arachnoid block was given in majority of patients 94%.General anesthesia was used only in 6% . An adverse cardiac event was most likely to occur during labor and in the immediate post partum period. The most common cardiac complications are congestive heart failure and arrhythmias. They usually respond well to medical therapy. Advanced NYHA functional class and prior history of heart failure are the most important risk factors for an adverse cardiac event.Hence delivery was best carried out at a tertiary center ,where both experienced cardiologist and obstetrician is present.

Regional anesthesia such as epidural or spinal was safe in cardiac patients presenting for caesarean section. Spinal anesthesia was safely used in 94% of patients who underwent LSCS. Other studies have reported caesarean sections with cardiac disease under spinal anesthesia with a success rate of 99%.[21]

So, it is important to educate patients and create awareness that surgical correction of the cardiac condition, and optimization of cardiac status prior to pregnancy will help to achieve a good maternal outcome.

Conclusion:-

Major cardiovascular changes are seen during pregnancy, labor, and delivery and the postpartum period. It is essential to distinguish physiological changes of pregnancy from those of a worsening cardiac condition. It is important for the physician to be familiar with the treatment of commonly encountered cardiac diseases during pregnancy.

A multidisciplinary approach with obstetric care at a center equipped to handle high risk patients, specialized cardiology assessment and follow-up is recommemded as Cardiac disease is an important cause of maternal and perinatal morbidity and mortality. Patients with NYHA class I/II had a better maternal outcome than those with NYHA class III/IV. Surgical correction of the cardiac lesion before the pregnancy was associated with better pregnancy outcome.

Funding:
There was no financial support from any specific grant from funding agencies in the public,commercial,or not –for-profit sectors for this study.

Declarations
Conflict of Interest :
All authors declare they have no conflict of interest.

Ethical Approval :
This is retrospective study involving collection of data and hence there were no direct risk to participants.Study has been approved by the Hospital ethical committee.

References:-

1.Weiss BM, von SegesserLK,AlonE,SeifertB,TuriaMI.Outcome of cardiovascular surgery and pregnancy.A systemic review of the period 1984-1996.Am J Obstet Gynecol.1998 179: 1643-1653

2. Hsuth WA, Luetscher JA, Carlson EJ, Grislis G, Fraze E, et al. Changes in active and inactive renin throughout pregnancy. J ClinEndocrinolMetab 1982;54:1010-6.
3. Bhatla N, Lal S, Behera G, Kriplani A, Mittal S, Agarwal N et al. Cardiac disease in pregnancy. Int J Gynecol Obstet. 2003;82(2):153-9.
4. Stagngl V SchadJ,GossingG.BorgesA,etal.Maternal heart disease and pregnancy outcome: a single centre experience .Eur J Heart Fail.2008;10:855-860.
5.Siu SC,SermerM,ColmanJM.et al .Prospective multicentre study of pregnancy outcomes in women with Heart disease .Circulation 2001:104:515-521
6. Sawhney H, Aggarwal N, Suri V, Vasishta K, Sharma Y, Grover A. Maternal and perinatal outcome in rheumatic heart disease. Int J Gynecol Obstet. 2003;80:9-14.
7. Trinidad D, Cox RA. Heart diseases during pregnancy. P R Health Sci J. 2006;25:259-65.
8. Arafeh JM, Baird SM. Cardiac disease in pregnancy. Crit Care Nurs Q. 2006;29:35-52.
9. Doshi HU, Oza HV, Tekani H, Modi K. Cardiac disease in pregnancy--maternal and perinatal outcome. J Indian Med Assoc 2010;5:108:278-80.
10. Bagde ND et al. Int J ReprodContraceptObstet Gynecol. 2013 Mar;2(1):52-7.
11.C .N. Sheela et al., Int J Pharm Biomed Res 2011, 2(4),261-5
12 . Sawhney H, Suri V, Vasishta K, et al: Pregnancy and congenital heart ddisease-maternal and fetal outcome
13. Doshi HU, Oza HV, Tekani H, Modi K. Cardiac disease in pregnancy--maternal and perinatal outcome. J Indian Med Assoc 2010;5:108:278-80
14. Katz M, Pinko A, Lurio S, et al: Outcome of pregnancy in 110patients with organic heart disease. J Reprod Med 31343,1986.
15. Rachdi R, Hajjami R, Fekih MA, et al: Caract6ristiques de la grossesse et de I'accouche- ment chez la femme cardiaque. Rev Fr Gyn6col Obst6t 87427;1992.
16. Sachs BP, Brown DAJ, DriscollSG,et al: Hemorrhage, infection, toxemia, and cardiac disease, 1954-85: Causes for their declining role in maternal mortality. Am J Public Health 78671,1988.
17. Siu SC, Sermer M, Colman JM, Alvarez AN, Mercier LA, Morton BC, Kells CM, Bergin ML, Kiess MC, Marcotte F, Taylor DA, Gordon EP, Spears JC, Tam JW, Amankwah KS, Smallhorn JF, Farine D, Sorensen S. Prospective multicenter study of pregnancy outcomes in women with heart disease. Circulation. 2001; 104:515– 21.
18. Avila WS, Rossi EG, Ramires JA, Grinberg M, Bortolotto MR, Zugaib M, da Luz PL. Pregnancy in patients with heart disease: experience with 1,000 cases. ClinCardiol. 2003;26:135–42
19. Zeldis SM. Dyspnea during pregnancy: Distinguishing cardiac from pulmonary causes. Clin Chest Med 13:567, 1992.
20. De Swiet M: Maternal mortality from heart disease in pregnancy. Br Heart J 69:524, 1993.
21. Dresner M, Pinder A. Anaesthesia for caesarean section in women with complex cardiac disease: 34 cases using the Braun Spinocath spinal catheter. Int J ObstetAnesth. 2009; 18:131–6.