



Prevalence of Mitral Valve Disease in Pregnancy and its Effects on Maternal-Fetal Outcomes

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Abstract

Objective: Heart diseases are among the most prevalent diseases that endanger the life of both mother and fetus and cause complications for them. Rheumatic mitral valve is the most prevalent organic involvement in pregnant women with mitral valve disease in Southeast Asia. Mitral valve disease is a serious and common problem for pregnant women. Despite medical and surgical advances in treatment of heart diseases, it is still the fourth cause of mortality in pregnant women. Accordingly, the purpose of this study was to assess the prevalence of mitral valve disease in pregnancy and its effects on maternal-fetal outcomes.

Material and Methods: This cross-sectional study was conducted on pregnant women with heart problems who were selected through convenience sampling. Data were analyzed in SPSS version 17.0.

Results: Findings showed that heart valve problems were the most frequent medical history of pregnant women. Among the subjects, the most prevalent heart disease was related to Mitral Stenosis (MS) (39.6%) and mitral valve prolapse (MVP) (22.8%). The most frequent causes of hospitalization were high blood pressure (43.2%) and chest pain (38.2%). The mean age of participants was 25±83 years.

Conclusion: Heart diseases during pregnancy are highly risky, but their progress and complications for mother and fetus can be avoided by constant prevention and treatment before and during pregnancy.

Keywords: Pregnancy, Heart disease, Mitral valve stenosis

Introduction

Pregnancy is the time of change, hope, waiting and worry for women and their families. This period is a natural and physiological phenomenon, but if accompanied by risk factors, it could lead to mother's disability or even maternal and fetal mortality (1). Pregnancy with heart disease is considered high-risk pregnancy; although the incidence of heart disease during pregnancy has decreased over the last 25 years, it is still the fourth cause of mortality among pregnant women (2). Even in the ideal condition, pregnancy would be a stressful period for a mother and if accompanied by existing medical problems or pregnancy complications, the stress and anxiety would escalate (3). Rheumatic mitral valve is the most prevalent organic involvement in pregnant women with mitral valve disease in Southeast Asia (4) and the most prevalent cause of heart valve mitral seen in 5% to 10% of the population (5,6). Mitral valve prolapse (MVP) is a condition in which one or both valve flaps bulge upward during left atrial systole. Common clinical symptoms of this syndrome are due to the involvement of one or more parts of mitral valve,

chordae tendineae, papillary muscle and immune ring; in terms of gender prevalence, women are affected 2 times higher than men (7). Mitral valve disease is a serious and prevalent problem in pregnant women (8). In a research it was reported that the prevalence of the disease is 8 in 1000 in Iran (9). Framingham reported the prevalence of 2.4% while Hepner argued that the actual estimate of MVP is much less than the previous reports (10). Despite these results, a research has shown that 15 million Americans have this disorder (11). More than 60 000 people in England and 60 000 people in the United States go through mitral valve replacement surgery each year (12). According to international statistics, 1% to 5% of women of reproductive age may have a heart disease and some women of reproductive age have prosthetic heart valves instead of damaged mitral, aortic or tricuspid valve (13). This disease remains without any symptoms for a long time in most of the patients and is diagnosed in the second and third decades of life (14,15).

Due to recent advances in cardiovascular surgeries, gynecologists now deal with a broader range of pregnant

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women with heart problems than previous decades (16). Pregnancy in women with heart valve diseases is accompanied by higher rates of maternal mortality and unfavorable fetal outcomes; as such, timely diagnosis and treatment of heart valve diseases during pregnancy are highly necessary (17). Therefore, given the importance of the issue and high prevalence of heart valve diseases in third world countries and in order to achieve better and more effective pregnancy outcomes in patients with valve-related complications, the present study was performed to assess the prevalence of mitral valve disease in pregnancy and its effects on maternal-fetal outcomes.

Material and Methods

This cross-sectional study was conducted on 120 pregnant women attended Madani Heart hospital, Tabriz, Iran from October 2015 to September 2017. Subjects were selected by convenience sampling. Data were collected through a 2-part researcher-made questionnaire. The first part included demographic information and the second part was related to heart and heart valve diseases. The data were analyzed using SPSS Version 17.0.

Results

During the research period, 120 pregnant women were identified, of whom 72 (86.4%) lived in urban areas and 48 (57.6%) lives in rural areas. The mean age of participants was 25 ± 83 years. Thirty-nine (46.8%) participants were illiterate, 43 (51.6%) had attained only primary education, 19 (22.8%) had high school diploma, 11 (13.2%) had bachelor’s degree and 8 (9.6%) had master’s degree. Seventy-eight (93.6%) participants were housewife and 42 (50.4%) participants were civil servants (Table 1). The most frequent causes of hospitalization were high blood pressure (43.2%) and chest pain (38.2%) and the least frequent causes were related to eclampsia and preeclampsia (1.2%) (Table 2). Heart valve problems were the most frequent medical history of pregnant women (Figure 1). The most prevalent heart disease was related to mitral stenosis (MS) (39.6%) and MVP (22.8%). Nineteen (28.8%) participants had undergone mitral valve replacement surgery, 9 (10.8%) had undergone aortic valve replacement and 10 (22%) had undergone aortic and mitral valve replacement surgery (Table 3). Sixty-

two (74.4%) participants had history of abortion and 33 (39.6%) had history of spontaneous abortion (Table 4). Sixty-two participants had natural childbirth and 48 (57.6%) had C-section (Table 5). Forty-six (55.2%) had no history of hospitalization and 5 (6%) had 4 hospitalizations (Table 6). Thirty-five (42%) participants had high blood pressure risk factor and 3 (3.6%) participants had smoking risk factor (Figure 2).

Discussion

Rheumatic heart diseases are the most common cause of valve diseases among Iranian pregnant women and the most common cause of heart complications in pregnant women is congenital heart defects (18). Rheumatic MS is the most prevalent valve anomaly in pregnant women that may be accompanied by pulmonary stenosis, edema and atrial fibrillation during and after pregnancy (19). In the present study, MS was the most frequent (39.6%) heart disease. Shahgheibi and Naghshbandi reported MS (22%) as the most common disease in pregnant women (20). Dadgar and Porjavad found that the most common cause of cardiovascular diseases was rheumatic heart disease (96.8%) (21). In a research it was shown that moderate to severe MS has a noticeable effect on fetal outcomes

Table 2. Frequency Distribution of the Reason for Hospitalization in Pregnant Women Studied

Variable	No. (%)
Hypertension	36 (43.2)
Chest pain	33 (38.2)
Tachycardia	13 (15.6)
Dyspnea	8 (9.6)
Cough and edema	6 (7.2)
Fatigue	5 (6)
Cyanosis and headache	4 (4.8)
Sweating	4 (4.8)
Vertigo	3 (3.6)
Syncope	2 (2.4)
Electrophysiology study	2 (2.4)
Diabetes mellitus	2 (2.4)
Pre-eclampsia	1 (1.2)
Eclampsia	1 (1.2)

Table 1. Demographic Data of the Studied Population

Variable	No. (%)	
Education	Illiterate	39 (46.8)
	Under high school diploma	43 (51.6)
	Diploma	19 (22.8)
	Bachelor degree	11 (13.2)
	Master degree	8 (9.6)
Living place	Cities	72 (86.4)
	Rural areas	48 (57.6)
Occupation	Housewife	78 (93.6)
	Employee	42 (50.4)

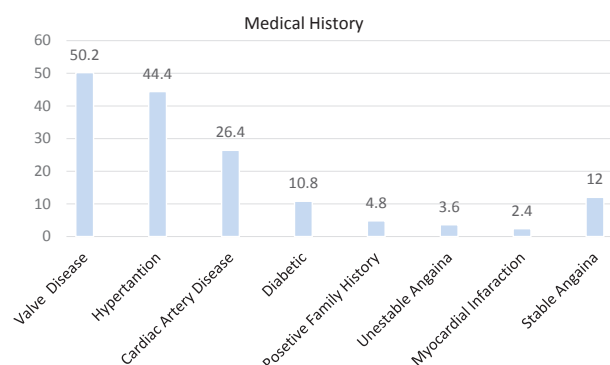


Figure 1. Frequency Distribution of Medical History in Pregnant Women Studied (Data are presented as percentage).

Table 3. Frequency Distribution of Heart Diseases in Pregnant Women Studied

Variable	No. (%)
Mitral stenosis	33 (39.6)
Mitral surgery	24 (28.8)
Mitral prolapse	19 (22.8)
Mitral regurgitation	13 (15.6)
Mitral and aorta surgery	10 (12)
Aorta surgery	9 (10.8)
Aorta regurgitation	3 (3.6)
Cardiomyopathy	3 (3.6)
Unstable angina	2 (2.4)
Tetralogy Fallot	2 (2.4)
Sinus tachycardia	1 (1.2)
Myocardial infraction	1 (1.2)

Table 4. Frequency Distribution of Embryonic Outcomes in Pregnant Women Studied

Variable	No. (%)
Abortion	62 (74.4)
Spontaneous abortion	33 (39.6)
Live fetus	20 (24)
Dead fetus	5 (6)

Table 5. Frequency Distribution of Delivery type in Pregnant Women Studied

Variable	No. (%)
Natural vaginal delivery	62 (74.4)
Cesarean delivery	48 (57.6)
Abortion therapy	10 (12)

and may lead to fetal mortality in women with MS and it accounts for 30% of fetal mortality in pregnancies (22). A study in India reported that premature birth, infant weight loss and Apgar score of less than 8 were very high in patients with valve diseases (48.3%) (23). Studies also show that mortality rate in pregnant women with the minimal symptoms of heart disease is around 1% while it may increase up to 15.5% in pregnant women with

Table 6. Frequency Distribution of Pregnancy History in Pregnant Women Studied

Variable	No. (%)
No history	46 (55.2)
Once	32 (38.4)
Twice	27 (32.4)
3 times	10 (12)
4 Times and more	5 (6)

severe symptoms (24). In a study done in Canada, the rate of neonatal complications in newborns of mothers with heart diseases was 18% while it was 7% in newborns of healthy mothers (25). Fetal mortality was 9.7% in a related study (26). In a study by Majoko et al, fetal outcomes had occurred in 73.3% of pregnant women (27). In a review study performed on 2000 pregnant women, neonatal outcomes due to heart diseases had occurred in 11% of women (28).

In the present study, 74.4% of pregnant women had a history of abortion and 39.6% had a history of spontaneous abortion. Other study reported that 50% of pregnancies led to abortion and 26.98% led to spontaneous abortion (29). Most of the patients with heart diseases are capable of natural childbirth, but many still believe that because of the pressure imposed on heart these women are not capable of natural childbirth. If a woman has a congenital rheumatic heart disease, conduction and heart muscle disorders, she can go through natural birth as she has gone through pregnancy; this is the case with 90% of mothers with heart disease (30). In our study, 74.4% of the pregnant women had natural childbirth. Shahgheibi and Naghshbandi also reported that 64.4% of the pregnant women had natural childbirth (20).

In the present study, the most frequent causes of hospitalization were high blood pressure, chest pain, palpitations and dyspnea. Dadgar and Porjavad reported the most common clinical symptom as dyspnea which is not consistent with our findings (21). The most frequent risk factors in this study were related to high blood

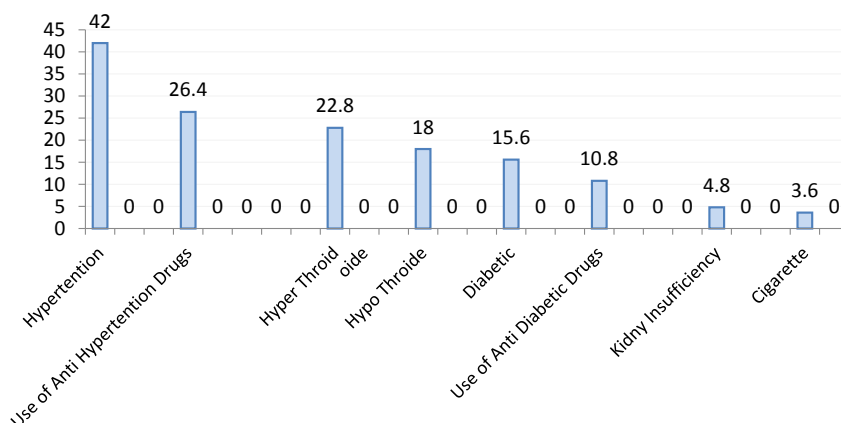


Figure 2. Frequency Distribution of Risk Factors in Pregnant Women Studied (Data are presented as percentage).

pressure and history of using blood pressure medications. Moreover, in women with a medical history, 50.4% had heart valve problems, 44.4% had high blood pressure and 26.4% had heart failure. In a study by Earing and Webb, blood pressure disorders were the most frequent risk factors in pregnancy with heart diseases (14.6%) (31).

Rheumatic involvement of valve is still the most prevalent heart disease in pregnant women in 75% of the cases happening as MS (32). Since the symptoms of heart valve disease might first appear during pregnancy, the best time to treat women with heart valve disease is before pregnancy and affected women should be regularly examined by specialists during pregnancy (33) because for some women, especially those at risk and with poor heart functioning, pregnancy is a serious threat leading to premature death. Therefore, pre-pregnancy counseling is necessary for all women especially those who have a heart disease.

Conclusion

Pregnancy in women with congenital heart diseases can endanger both mother and fetus and in severe cases may lead to premature maternal and fetal death. Therefore, women with valve disease require follow-up during pregnancy, delivery and after delivery in order to prevent unwanted complications in mother and fetus. In addition, teaching families to follow principles of family planning and avoid frequent pregnancies especially in women with heart valve disease, frequent examinations to identify risk factors, timely control of complications and preventing unintended pregnancy are recommended.

Conflict of Interests

Authors declare that there is no conflict of interest.

Ethical Issues

The local research ethics committee approved the study.

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