

## Complications of Mitral Stenosis in Pregnancy

**Berina Divanovic\***University Clinical Center of Sarajevo,  
Pakistan**\*Corresponding author:** Berina Divanovic

✉ berinadivanovic@hotmail.com

University Clinical Center of Sarajevo,  
Pakistan.**Tel:** +387 33 297-000

### Abstract

Mitral valve stenosis occurs when mitral valve opening is narrowed. Therefore blood flow is reduced, and the volume and pressure of blood in left atrium increases. As the result, the left atrium enlarges and beats in irregular pattern. In pregnancy mitral stenosis can contribute to maternal, neonatal and fetal complications. Therefore aim of this work is to present complications of mitral stenosis in pregnancy.

**Keywords:** Mitral stenosis; Pregnancy; Complications; Management

**Received:** December 18, 2017, **Accepted:** December 24, 2017, **Published:** December 31, 2017

**Citation:** Divanovic B (2017) Complications of Mitral Stenosis in Pregnancy: Review. Cardiovasc Investig. Vol.1 No.1:4

### Introduction

Mitral valve is located between two chambers, left atrium and ventricle. Through mitral valve blood is pumped from the left atrium to the left ventricle. Health mitral valve enables normal blood flow through chambers. Mitral valve stenosis occurs when mitral valve opening is narrowed. Therefore blood flow is reduced, and the volume and pressure of blood in left atrium increases. As the result, the left atrium enlarges and beats in irregular pattern. Because of the reduced blood flow, the blood clots can be formed in inside the chamber. If blood clot becomes embolus, it may block an artery, causing a stroke or other damage. Mitral stenosis is usually consequence of rheumatic fever, or infants are born with this condition. Symptoms are usually minimal, because mitral stenosis develops slowly over time. The most common symptoms are: shortness of breath, fatigue, swollen feet or legs, heart palpitations, dizziness or fainting, coughing up blood, chest discomfort or chest pain [1,2].

Cardiovascular changes in pregnancy can contribute to maternal, fetal and neonatal complications. Pregnancy in women with mitral stenosis requires precise planning in order to avoid possible complications, which can be fatal. For the best outcome, multidisciplinary approach is necessary during pregnancy. Also antenatal management is very important in order to avoid cardiac decompensating [3].

### Diagnosis

The main diagnostic imaging method for determining mitral stenosis is echocardiography. While echocardiography provides information about the area of mitral valve, size and function of

left atrium and ventricle, and presence of thrombus, Doppler examination provides information about complexity of the stenosis. Transoesophageal echocardiography is used when valve cannot be assessed with transthoracic echocardiography. Also this method is useful to determine presence of intracardiac thrombi before a surgical intervention [4,5].

### Management of Mitral Stenosis

One of the greatest challenges in mitral stenosis is adequate management and therapy, and patients with moderate or severe mitral stenosis should be counselled against pregnancy. Main goal of management is to slow the heart rate. Pregnancy brings risks and complications for patient with mitral stenosis. Fetus is also affected, and there is risk for premature birth and intrauterine growth retardation. Drugs for mitral stenosis are not highly recommended in pregnancy. Therapy is symptomatic, activity should be restricted.  $\beta$ -1 selective blockers are used, and diuretic can be used if symptoms persist. Women with moderate or severe mitral stenosis, large left atrium, low cardiac output or congestive heart failure have high thrombo-embolic risk. Therefore in therapy are used anticoagulation drugs. Women class III or IV of New York Heart Association class should only be considered for operation during pregnancy. It is usually performed after 20 gestation week.

Delivery of child should be vaginal in patients with mild, or moderate and severe mitral stenosis without pulmonary hypertension, while Cesarean section is considered in patients with moderate and severe mitral stenosis class III and IV or have pulmonary hypertension [6,7].

## Complications

Complications as pulmonary edema and arrhythmias occurred in 35% of the pregnancies, while incidence of the other maternal cardiac complications correlates with the severity of the mitral stenosis [3].

In pregnancy heart rate is increased, consequently left atrial and pulmonary pressures are increased. During the second or third trimester, in pregnant women with mitral valve stenosis can occur cardiac decompensation and pulmonary edema, while the risk of maternal death is greatest during labour or during the immediate post-partum period. The autotransfusion from the uterus can flood the central circulation, that can lead to severe pulmonary edema. The risk of pulmonary edema continues for several days after delivery, because autotransfusion of blood can last for 24-72 h after delivery [8].

Mortality rate vary, where for class I and II is <1%, while for class III and IV they range between 5 and 15%. Patient's symptoms during pregnancy are increased by one New York Heart Association class [9].

The worst outcome in pregnant patients with mitral stenosis is miscarriage, and it was reported in study conducted by Siu et al. Also mitral stenosis was present together with the principal lesions of congenital aortic stenosis and coarctation. Pulmonary hypertension can develop in pregnancy, as a result of mitral stenosis [10]. Increased maternal morbidity was also reported in study conducted by Hameed et al. where most of the patients from class I patients advanced during pregnancy to class II, while patients from class II advanced to class III or IV. Also there was a higher incidence of congestive heart failure and arrhythmias in

patients with mitral stenosis. Despite high incidence of maternal morbidity, no mortality was reported [11].

In patients with mild to moderate mitral stenosis during pregnancy was reported increase of left atrium diameter, and significant decrease of left atrium diameter after delivery. However change in cardiac output was not observed, while after delivery it significantly decreased. Ejection fraction did not change significantly during pregnancy and after delivery [12].

Maternal deaths are rare in developed countries in North America and Europe, and no maternal deaths were reported, based on four large studies of pregnant women with mitral stenosis [3,10-13]. In South American study conducted by Avila et al. from 54 women with moderate to severe mitral stenosis, eight maternal deaths occurred as a result of heart failure. In a study conducted by al Kasab et al. in 50 women with mitral stenosis maternal mortality was high 32% [14,15]. Also in sub-Saharan Africa were reported maternal deaths in pregnant women with mitral stenosis. Most of the women with mitral stenosis had pulmonary oedema [16].

## Conclusion

In pregnant patients with mitral stenosis heart failure occurred often and 35% of these patients had pulmonary hypertension. Women with abnormalities causing pulmonary hypertension, such as mitral stenosis, went into heart failure before 30 week gestation [17]. Mitral stenosis also affect fetus, adverse fetal outcomes associated with mitral stenosis include preterm delivery, intrauterine growth retardation, low birth weight or neonatal death [18]. Women with mitral stenosis before planning their pregnancy should be counselled about possible complications and outcomes.

## References

- 1 Nishimura RA, Otto CM, Bonow RO, Carabello BA, Erwin JP, et al. (2014) AHA/ACC guideline for the management of patients with valvular heart disease: Executive summary. *J Am Coll Cardiol* 63: 2438-88.
- 2 Di Mauro M, Gallina S, D'Amico MA, Izzicupo P, Lanuti P, et al. (2013) Functional mitral regurgitation. *Int J Cardiol* 163: 242-248.
- 3 Silversides CK, Colman JM, Sermer M, Siu SC (2003) Cardiac risk in pregnant women with rheumatic mitral stenosis. *Am J Cardiol* 91: 1382-1385.
- 4 Zeng X, Tan TC, Dudzinski DM, Hung J (2014) Echocardiography of the mitral valve. *Prog Cardiovasc Dis* 57: 55-73.
- 5 Wunderlich NC, Beigel R, Siegel RJ (2013) Management of mitral stenosis using 2D and 3D echo-doppler imaging. *JACC Cardiovasc Imaging* 6: 1191-1205.
- 6 Elkayam U, Bitar F (2005) Valvular heart disease and pregnancy. *J Am Coll Cardiol* 46: 223-230.
- 7 Endorsed by the European Society of Gynecology (ESG), Regitz-Zagrosek V, Blomstrom Lundqvist C, Borghi C, Cifkova R, et al. (2011) ESC Guidelines on the management of cardiovascular diseases during pregnancy: The task force on the management of cardiovascular diseases during pregnancy of the European Society of Cardiology (ESC). *Eur Heart J* 32: 3147-3197.
- 8 Mann DL, Zipes DP, Libby P, Bonow RO, Braunwald E (2015) Braunwald's heart disease: A textbook of cardiovascular medicine (10th edn.). Elsevier/Saunders, Philadelphia.
- 9 Kannan M, Vijayanand G (2010) Mitral stenosis and pregnancy: Current concepts in anaesthetic practice. *Indian J Anaesth* 54: 439.
- 10 Sm SCS, Sermer M, Harrison DA, Grigoriadis E, Liu G, et al. (1997) Risk and predictors for pregnancy-related complications in women with heart disease. *Circulation* 96: 2789-2794.
- 11 Hameed A, Karaalp IS, Tummala PP, Wani OR, Canetti M, et al. (2001) The effect of valvular heart disease on maternal and fetal outcome of pregnancy. *J Am Coll Cardiol* 37: 893-899.
- 12 Leśniak-Sobelga A, Tracz W, Kostkiewicz M, Podolec P, Pasowicz M (2004) Clinical and echocardiographic assessment of pregnant women with valvular heart diseases—maternal and fetal outcome. *Int J Cardiol* 94: 15-23.
- 13 Madazli R, Şal V, Çift T, Guralp O, Goymen A (2010) Pregnancy outcomes in women with heart disease. *Arch Gynecol Obstet* 281: 29-34.

- 14 Avila WS, Rossi EG, Ramires JAF, Grinberg M, Bortolotto MRL, et al. (2003) Pregnancy in patients with heart disease: Experience with 1,000 cases. *Clin Cardiol* 26: 135-142.
- 15 Al Kasab SM, Sabag T, Al Zaibag M, Awaad M, Al Bitar I, et al. (1990)  $\beta$ -Adrenergic receptor blockade in the management of pregnant women with mitral stenosis. *Am J Obstet Gynecol* 163: 37-40.
- 16 Diao M, Kane A, Ndiaye MB, Mbaye A, Bodian M, et al. (2011) Pregnancy in women with heart disease in sub-Saharan Africa. *Arch Cardiovasc Dis* 104: 370-374.
- 17 Ruys TPE, Roos-Hesselink JW, Hall R, Subirana-Domènech MT, Grando-Ting J, et al. (2014) Heart failure in pregnant women with cardiac disease: data from the ROPAC. *Heart* 100: 231-238.
- 18 Siu SC (2002) Adverse neonatal and cardiac outcomes are more common in pregnant women with cardiac disease. *Circulation* 105: 2179-2184.