

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20221297>

Case Series

Cardiac disease and pregnancy: a case series of 19 patients

El Hassan El Ghali*, Jihane Meziyane, Soukaina Aouragh,
Hafsa Taheri, Hanane Saadi, Ahmed Mimouni

Department of Gynaecology and Obstetrics, Mohammed VI University Hospital, Oujda, Morocco

Received: 07 January 2022

Accepted: 06 April 2022

***Correspondence:**

Dr. El Hassan El Ghali,

E-mail dr.elghali2016@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

In industrialized countries, cardiac disease is a major cause of maternal mortality. The cardiac pathology is further made worse by the significant decrease in the heart function. Our work is a case series of 19 patients who have been admitted to the gynaecology-obstetrics department for the occurrence of pregnancy in the context of cardiac pathology. We report our results, along with a discussion and a review of literature. Cardiac disease is a major cause of maternal mortality in industrialized countries. Management of cardiac diseased pregnant women should be multidisciplinary.

Keywords: Cardiac disease, Pregnancy, Multidisciplinary management

INTRODUCTION

Cardiac disease negatively affects the pregnancy, and the cardiac function is significantly decrease because of physiological changes of pregnancy.¹

Cardiac disease is a major cause of maternal mortality in industrialized countries. In United States, approximately 4% of pregnant women are affected by cardiac disease.^{2,3}

Among cardiac diseases in pregnant women, congenital ones are the most prevalent, predisposing to a risk of cardiac arrest.⁴

In addition, signs and symptoms experienced during a normal pregnancy are similar to those of cardiac disease, resulting in a confusing clinical picture.

In our work, we present a series of 19 cases of pregnancy in the context of heart disease, along with a discussion about effects of pregnancy on cardiac function, diagnostic difficulties and challenges of obstetric management.

CASE SERIES

In this work, we report a series of 19 cases of pregnant women who had history of cardiopathies, or in whom a

diagnosis of heart disease has been made during or after pregnancy. Patients' data collected from the gynecology-obstetrics department and from the cardiology department in a period of 7 years extending from 2014 to 2020. The ages of patients range from 22 to 40 years old, with an average of 32.6 years old. All cases of our series have been admitted to gynecology-obstetrics department for different indications: giving birth in 42% of cases, therapeutic termination of pregnancy in 15.7%, labor induction in 15.7%, heart disease related symptoms in 21% and intra utero growth restriction in 5.6%. 26.3% of the cases were uniparous, 47.4% were biparous, 21% were multiparous and 5.3% nulliparous. In our series, 17 (89.5%) of the patients have already given birth, with 29.4% of them having a history of abortion, 17.6% had a history of stillborn and 53% with no particular history. Concerning our patient's personal history, 5 patients (26.3%) had history of repeated sore throat episodes, 5.3% had history of renal lithiasis and 10.5% had a history of hypercholesterolemia. In our series, 1 patient was known to have Ebstein disease diagnosed 2 years before actual pregnancy, 1 patient was known to have a familial hypertrophic cardiomyopathy and one patient was known to have a junctional tachycardia. We also recorded 4 patients (21%) who had H/O valvuloplasty, 1 patient (5.3%) had surgical repair of an interventricular defect.

Table 1: Summary table.

Patients	Age (Years)	Parity	Known H/O cardiac disease	Circumstances of diagnosis	Cardiac disease	Indication for admission	Labor at admission	Blood test data	Termination of pregnancy	Type of delivery
1	22	Uniparous	Yes	Symptoms	Valvulopathy	Giving birth	Yes	-	No	Vaginal delivery
2	31	Biparous	Yes	Symptoms	Valvulopathy	Giving birth	Yes	Anemia	No	Vaginal delivery
3	35	Multiparous	Yes	Symptoms	Valvulopathy	Giving birth	Yes	thrombopenia	No	Vaginal delivery
4	40	Biparous	Yes	Systematic screening	Valvulopathy	Therapeutic termination	No	Anemia thrombopenia	Yes	-
5	34	Biparous	No	Symptoms	Supraventricular tachycardia	Giving birth	No	-	No	Vaginal delivery
6	30	Biparous	Yes	Symptoms	Valvulopathy	Giving birth	Yes	Anemia	No	Vaginal delivery
7	31	Multiparous	Yes	Symptoms	Valvulopathy	Labor induction	No	Anemia	No	Caesarean section
8	29	Biparous	Yes	Symptoms	Valvulopathy	Giving birth	No	-	No	Vaginal delivery
9	34	Nulliparous	No	Symptoms	Peripartum cardiopathy	Giving birth	No	Anemia	No	Vaginal delivery
10	27	Uniparous	Yes	Systematic screening	Interventricular defect	Giving birth	Yes	Thrombopenia	No	Vaginal delivery
11	28	Uniparous	Yes	Symptoms	Valvulopathy	Therapeutic termination	No	-	Yes	-
12	34	Biparous	Yes	Symptoms	Valvulopathy	Labor induction	No	-	No	Vaginal delivery
13	37	Biparous	Yes	Symptoms	Valvulopathy	Therapeutic termination of pregnancy	No	-	Yes	-
14	31	Uniparous	No	Systematic screening	Ebstein disease	Labor induction	No	Anemia thrombopenia	No	Caesarean section
15	34	Biparous	Yes	Symptoms	Familial hypertrophic cardiomyopathy	Symptoms	No	Thrombopenia	No	Vaginal delivery
16	43	Multiparous	No	Symptoms	Valvulopathy	symptoms	No	anemia	No	Vaginal delivery
17	30	Uniparous	Yes	Systematic screening	junctional tachycardia	Intra utero growth restriction	No	leukocyturia	No	Vaginal delivery
18	42	Biparous	Yes	Symptoms	Valvulopathy	symptoms	No	-	No	Vaginal delivery
19	28	Multiparous	No	Symptoms	Valvulopathy	symptoms	No	-	No	Vaginal delivery

One patient had a cardiac valve replacement and another a double valvular replacement (mitral and aortic).

Heart disease nature varied from one patient to another in our series. We recorded 10 cases (52.6%) of valvulopathies, one case of peripartum cardiopathy, one case of interventricular defect, one case of supraventricular tachycardia, one case of Ebstein disease, one case of familial hypertrophic cardiomyopathy and one case of junctional tachycardia. These heart diseases were diagnosed prior to pregnancy in 14 cases (73.7%), during pregnancy in 4 cases (21.1%) and after pregnancy in 1 case (5.3%). The cardiopathy was revealed in the majority of cases by symptoms (Dyspnea being the most frequent one) in 15 cases (78.9%). The majority of patients who presented with symptomatic heart disease presented dyspnea, scored NYHA 4.

At admission, only 5 patients (26.3%) were in labor. The blood test data showed microcytic anemia in 37.37% of cases, thrombopenia in 26.3% of cases and leukocyturia in one case (5.3%).

On the therapeutic level, the specific treatment for the cardiopathy depended on its type and therapeutic termination of pregnancy was indicated in 3 cases (15.8%). For the rest of our series cases, the patients have given birth through vaginal delivery in 14 cases (73.7%) and through cesarian section in 2 cases (10.5%).

DISCUSSION

Among the many changes that occur during pregnancy, those with worse impact on cardiac disease include decrease in systemic vascular resistance, increase in intravascular volume, variation in cardiac output and hypercoagulability.⁸ Other changes include an increase in heart rate and in stroke volume.⁵

The intravascular volume increases progressively during pregnancy and this could be particularly problematic in cases of valvular disease, such as mitral or aortic stenosis.⁸ In these cases there may be a failure in maintaining a sufficient cardiac output.

The physiological drop in SVR during pregnancy may lead to various conditions depending on the nature of heart disease.⁶ It may lead to decompensation in cases of cardiac shunt or in lesions with consistent pressure to maintain cardiac output.⁶ The effect of this drop in SVR in pregnant women with a significant valve impairment can induce a decrease in the cardiac output.⁶ In patients with left to-right cardiac shunt, drop in SVR may lead to the Eisenmenger syndrome.

The hypercoagulable state of pregnancy increases risk of venous thromboemboli. This is particularly problematic in patients with mechanical heart valves, thus requiring therapeutic anticoagulation with low-molecular weight heparin or warfarin throughout gestation.⁶

Because of physiological variations in the cardiac output during pregnancy, decompensation can occur in patients with myocardial dysfunction or cardiac lesions that cannot accommodate the increase in circulating volume.⁷

Since physiological changes during pregnancy may cause symptoms similar to those observed in heart disease, it is important to pay attention to symptoms and signs that are observed in the second instance. These signs include: Cardiac signs: Heart rate >100 bpm, 4th heart sound, harsh systolic murmur, diastolic murmur, chest pain, pulmonary signs: Pleural effusion, pulmonary edema, important shortness of breath, orthopnea, nocturnal cough, and/or paroxysmal dyspnea, heart disease can be either congenital or acquired (eg, coronary artery disease, cardiomyopathy) cardiac disease.

The 7% to 8% of case of pregnancy with congenital cardiac disease develop complications. These include cardiogenic pulmonary edema and dysrhythmias.⁸

Heart condition like endocarditis, coronary artery disease, pulmonary hypertension, dysrhythmias, cardiomyopathy predispose to highest risk of maternal mortality.^{9,10}

A lower risk of complications is observed in ventricular septal defects, in simple atrial septal defects and in pulmonary stenosis.

Several complications have been reported in pregnant women with cardiac disease. These include gestational hypertension and preeclampsia.

The risk of cardiogenic pulmonary edema, dysrhythmias, and thromboembolism persists till 8 weeks of postpartum.

Neonatal complications include prematurity, small-for-gestational-age status and neonatal death, with the later been estimated to 2% in women with cardiac disease.¹¹

Evaluation of risk of complications in pregnant women can be achieved by using several methods NYHA classification is most important tools to assess risk. Higher NYHA classification is associated with a greater risk.¹²

Many score systems have been established to assess the risk, among which the modified WHO score is the most accurate predictor of pregnancy risk available.¹³⁻¹⁵

A management plan for pregnancy, delivery and postpartum is essential when a high-risk status exists. A cardiologist, a maternal-fetal medicine specialist, or an adult congenital heart disease, and an anesthesiologist should all be implicated.

In women with cardiomyopathy, a regional anesthesia is particularly beneficial since it improves cardiac output.¹⁶

Women with Eisenmenger syndrome have a risk of intracardiac shunt reversing when there is further decrease in SVR. They are not candidates for regional anesthesia.¹⁶

As mentioned, changes in clotting factors increase risk of thromboembolism.¹⁷ His risk is further increased when other factors, such as obesity and smoking also present.¹⁷

A prophylactic anticoagulation therapy is systematic in pregnant women at admission.¹⁷

Vaginal and cesarean birth are considered to be associated with low risk of bacteremia, explain thus that an antibiotic prophylaxis is not recommended.^{18,19}

However, pregnant women with prosthetic cardiac valve or surgically constructed palliative shunts are prone to a prophylactic antibiotic therapy.^{18,19}

Vaginal birth (with cesarean section when an obstetric indication exists) is generally accepted in most cases of congenital or acquired cardiac disease.

However, conditions such as ascending aorta dilation (>45 mm), symptomatic severe aortic stenosis, and severe heart failure could be indications for cesarean delivery.^{9,20}

CONCLUSION

Our work is a case series of 19 patients who have been admitted to the gynaecology-obstetrics department for the occurrence of pregnancy in the context of cardiac pathology. Cardiac disease is a major cause of maternal mortality in industrialized countries. Management of cardiac diseased pregnant women should be multidisciplinary.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. Cornette J, Ruys TPE, Rossi A. Hemodynamic adaptation to pregnancy in women with structural heart disease. *Int J Cardiol.* 2013;168(2):825-31.
2. Berg CJ, Atrash HK, Koonin LM, Tucker M. Pregnancy-related mortality in the United States, 1987-1990. *Bstet ynecol.* 996;88(2):161-7.
3. Berg CJ, Chang J, Callaghan WM, Whitehead SJ. Pregnancy-related mortality in the United States, 1991-1997. *Bstet ynecol.* 2003;101(2):289-96.
4. Roos-Hasselink JW, Duvekot JJ, Thomas SA. Pregnancy in high-risk cardiac conditions. *Heart.* 2009;95(8):680-6.
5. Greutmann M, Pieper PG. Pregnancy in women with congenital heart disease. *Heart J.* 015;36(37):2491-9.
6. Foley MR, Rokey R, Belfort MA. Cardiac disease. In: Belfort MA, Saade GR, Foley MR, Phelan JP, Dildy GA, eds. *Critical Care Obstetrics.* 5th ed. West Sussex, England: Wiley-Blackwell. 2010:122-4.
7. Norwitz ER, Robinson JN. Pregnancy-induced physiologic alterations. In: Belfort MA, Saade GR, Foley MR, Phelan JP, Dildy GA, eds. *Critical Care Obstetrics.* 5th ed. West Sussex, England: Wiley-Blackwell. 2010:30-52.
8. Drenthen W, Boersma E, Balci A. ZAHARA Investigators. Predictors of pregnancy complications in women with congenital heart disease. *Eur Heart.* 2010;31(17):2124-32.
9. Dye TD, Gordon H, Held B, Tolliver NJ, Holmes AP. Retrospective maternal mortality case ascertainment in West Virginia, 1985 to 1989. *M J Obstet gynecol.* 992;167(1):72-6.
10. De Swiet M. Maternal mortality from heart disease in pregnancy. *Br Heart J.* 1993;69(6):524.
11. Siu SC, Colman JM, Sorensen S. Adverse neonatal and cardiac outcomes are more common in pregnant women with cardiac disease. *Circulation.* 2002;105(18):179-2184.
12. Hsieh TT, Chen KC, Soong JH. Outcome of pregnancy in patients with organic heart disease in Taiwan. *Asia Oceania J Obstet gynaecol.* 1993;19(1):21-7.
13. Balci A, Sollie-Szarynska KM, van der Bijl AG. ZAHARA-II investigators. Prospective validation and assessment of cardiovascular and offspring risk models for pregnant women with congenital heart disease. *Heart.* 2014;100(17):1373-81.
14. Pijuan-Domènech A, Galian L, Goya M. Cardiac complications during pregnancy are better predicted with the modified WHO risk score. *Int J Cardiol.* 2015;195:149-54.
15. Fu Q, Lin J. Predictive accuracy of three clinical risk assessment systems for cardiac complications among Chinese pregnant women with congenital heart disease. *Int J Gynaecol Obstet.* 2016;134(2):140-4.
16. Gandhi M, Martin SR. Cardiac disease in pregnancy. In: Foley MR, Strong TH, Garite TJ, eds. *Obstetric Intensive Care Manual.* 5th ed. New York, NY: McGraw-Hill Education. 2018;115-35.
17. American College of Obstetricians and Gynecologists. Thromboembolism in pregnancy: ACOG Practice Bulletin No.196. *Obstet Gynecol.* 2018;132(1):e1-17.
18. Wilson W, Taubert KA, Gewitz M. Prevention of infective endocarditis: guidelines from the American Heart Association: a guideline from the American Heart Association Rheumatic Fever, Endocarditis, and Kawasaki Disease Committee, Council on Cardiovascular Disease in the Young, and the Council on Clinical Cardiology, Council on Cardiovascular Surgery and Anesthesia, and the Quality of Care and Outcomes Research Interdisciplinary Working Group. *Circulation.* 2007;116:1736-5.

Cite this article as: El Ghali EH, Meziyane J, Aouragh S, Taheri H, Saadi H, Mimouni A. Cardiac disease and pregnancy: a case series of 19 patients. *Int J Reprod Contracept Obstet Gynecol* 2022;11:1574-7.