INTERNATIONAL JOURNAL OF WOMEN'S HEALTH AND REPRODUCTION SCIENCES
http://www.ijwhr.net
doi: 10.15296/ijwhr.2013.03

Previous Heart Disease Complications And Hypertension In Pregnancy

Shahin Imani [1], Razieh Parizad [2*], Elham Porshahbaz [2], Roghayeh Fakhry [2], Nayer Pishnamaz [2]

Article History:
Received March 2013
Accepted April 2013
Available online May 2013

Keywords:
Hypertension
Cardiovascular diseases,
Pregnancy,
Complication

Corresponding Author:
Razieh Parizad, Cardiovascular Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
Tel: +989143134453
Email: r_parizad2003@yahoo.com

Abstract

Objectives: Hypertensive disorders in pregnancy with incidence of 3/7% are one of the most severe complications. Cardiovascular diseases are apparent in 2% of the pregnancies. Physiologic changes during pregnancy intensify the underlying disorders and the severity of this problem. Researches indicate that pregnant women with heart disease greatly confront unfavorable maternal and fetal outcomes with increased risk of abortion, intra uterine fetal death, preterm labor and intra uterine growth retardation. This study aim was to magnify the outcomes of pregnancy accompaniment with cardiovascular diseases and hypertension.

Materials and Methods: This is a retrospective descriptive study in which patient records of 2500 pregnant women referring to Alzahra hospital from 2006 to 2008 were assessed. Data was gatherated by medical files and analyzed by SPSS soft ware.

Results: In this study incidence of moderate Aorta Stenosis (AS) was about 45.5 % (10cases), Mitral valvuloplasty (MVP) was about 22/73% (5cases) and Mitral stenosis (MS) was 18/18% (4 cases); two patient with MR(mitral regurgitation)+MS had underwent valvuloplasty. 72/7% (16) of the mothers were hospitalized due to hypertension, 9/1% due to tachycardia and dyspnea and 18/2% showed mixed form of theses complains. They were using hydralazine and methyldopa as anti hypertensive drugs. Only 10% of the patients had history of anticoagulant using during pregnancy. We found only one patient with pulmonary stenosis (PS) in these patients.

Conclusion: Women with hypertension and previous heart disease showed many serious complications and high fetal mortality during pregnancy. Proper and on time care giving and support during pregnancy is dependent on the accurate diagnosis of the heart disease; any health problem should be seriously noted.

1. Cardiovascular Research Center,Tabriz University of Medical Sciences, Tabriz, Iran
2. Shahind Madani Heart Hospital, Tabriz university of Medical Sciences, Tabriz, Iran

Introduction:

Blood pressure drops in early gestation and it is usually 10mm Hg lower the baseline by the second trimester (1). This is induced by reduction in the peripheral resistance due to systemic vasodilatation and creation of a low resistance circuit in the gravid uterus. The mechanism of the vasodilatation is not clearly understood. Decreased vascular response to the pressure effects of angiotensin II but not epinephrine is a major factor (2). Hypertension in pregnancy is defined as a rise in blood pressure at least 30 mm Hg of the systolic or 15 mm Hg of the diastolic blood pressure above pre-gestation baseline. If previous blood pressure is unknown, a blood pressure level of 140/90 or above after the 20th week of gestation is considered abnormal. The U.S. joint National Committee for the Prevention, Detection, Evaluation and Treatment of High Blood Pressure (3) and the International Society for the Study of Hypertension in Pregnancy (4) Korotokoff Phase V (disappearance of the sound) for determining the diastolic blood pressure. while most of the European physicians use phase IV (muffling of the sound). Hypertensive disorders in pregnancy with incidence of 3/7% is one of the most severe complications (5) which pose a great clinical importance because of being related with maternal and fetal mortality (6). Five types of hypertensive disorders may occur during pregnancy: Gestational hypertension, preeclampsia, eclampsia, super imposed preeclampsia and chronic hypertension (1, 4, 7). Annually 50000 of pregnant women are sentenced to death all over the world (5).Cardiovascular disease are apparent in 2% of the pregnancies (1, 6, 9). Physiologic changes during pregnancy intensifies intensify the underlying disorders and adds to the severity of this problem. Researches indicate that pregnant women with significant heart disease confront unfavorable maternal and fetal outcomes (6,9) with increased risk of abortion, intra uterine fetal death, preterm labor and intra uterine growth retardation; on the other hand, fetal death up to 20-40% and 25-50% of maternal mortality are results of severe and persistent conditions comparing to low maternal mortality rate of 1-5% in less distressful cases (10,11); Besides, result of a research guided by American specialists' clinic verified adverse effect of maternal cardiovascular instability on fetal outcomes in which a higher incidence of preterm labor, low birth weigh and intrauterine growth restriction (IUGR) were detected (12).It is obvious that women with cardiovascular disease and hypertension will spend a stressful pregnancy whereas it is difficult to precisely anticipate the scope of the peril which highly necessitates accurate and continuous pregnancy care; this study aim to magnify the outcomes of pregnancy accompaniment with significant cardiovascular diseases and hypertension.

Material & Methods:

This is a retrospective descriptive study in which patient records of 2500 pregnant women referring to Alzahra hospital from 2006 to 2008 were assessed. 22 cases of pregnant patients with hypertension and previous cardiovascular diseases whom cardiologists visited them and confined their heart diseases according to the echocardiography enrolled to the study. Our scales were presence of hypertension according to the medical examination , biochemistry and echocardiography. Inclusion criteria are as below:

1.History of Blood pressure or current blood pressure ≥140/90 mm Hg after 20 gestation week and proteinuria ≥ 300 mg /24 hour or ≥1+ dipstick

2.Previous or pregnancy onset cardiovascular disease verified by a cardiologist.

3.History of hospitalization in high risk pregnancy ward.

Previous underlying disorders, chronic blood pressure, diabetes, nephropathy, collagen vascular disease and hyperthyroidism were considered as exclusion criteria (13).

Checklists were filled for all the cases which included demographic data in the first part and were accompanied with pregnancy changes and difficulties during labor; the third part was about neonatal characteristics. If there was any doubt about the information, a call contact was used. SPSS version 17.0 (SPSS, Chicago, IL, USA) was used for statistical analysis and P-value$<$0.05 was considered significant statistically. Continuous variables with normal distribution were presented as mean $\pm$ SD.

Results:

Mean of the maternal age was about 27/28 $\pm$3.20 years with minimum and maximum range of 20 and 38 years old respectively. Gravidity was different form 2 to 6 among the participants and parity was about 0-3. The average gestational age was 31/20$\pm$2/18 weeks with minimum and maximum age of 28 and 38 respectively. Cesarean delivery was done for 16 of the pregnancies as the result of fetal bradycardia (36/4%), placental abruption (9/1%) and abnormal bleeding (9/1%). Normal vaginal delivery had a percentage of about 27/3 .Mean of birth weight was 1520/10 $\pm$110/40. Most of the neonates had apgar score of about 7 or less who needed primary resuscitation.

In this study incidence of moderate Aorta Stenosis (AS) was about %45.5 (10 cases), MPV about 22/73% (5cases) and moderate Mitral stenosis 18/18% (4 cases); two patients with MR+MS had underwent valvuloplasty. 72/7% (16) of the mothers were hospitalized due to hypertension, 9/1% for tachycardia and dyspnea. Through call contact it was revealed that any woman was not awarded of the threats of their illness during pregnancy.

45/5% (10) of the neonates were male while there were 12 female neonates (54/4%). There were just two still births (both of them were male/ cesarean delivery) with birth weight of 800 grams and one of them with diaphragmatocele and the other one with omphalocele. There were 4 cases (36/4%) of Hyaline Membrane Disease (HMD), 2 cases of undescended testicle and diaphragmatocele, and 2 cases were burnt with foot defects. Most women needed to receive medical therapy in addition to limit of physical activity. The most frequently used drugs for manage of the heart rate were β-blockers. These have been proved to be effective in controlling the heart rate and thereby reducing the risk of pulmonary edema (14-15).In our study most of patients used β-blockers and anti androgenic drugs for hypertension treatment.

According to the results 8 patients (36.4%) had a history of chronic heart failure and 14 patients (63.6%) had valvular diseases. In this study according to the medical records and asking via phone call, any woman had not received adequate training and enough information about their pregnancy outcome from health services and their doctors Unfortunately.

Discussion:

Normal pregnancy related with adaptive cardiovascular changes. Pregnant women with cardiac diseases may be powerless to tolerate these changes even with optimal medical therapy, and life-threatening complications can happen. Commissurotomy or valve replacement during pregnancy is very high-risk trial both for mother and fetus. Percutaneous valvuloplasty is a valid alternative to cardiac surgery. Pregnancy in patients with MVP is contriversial and many experts in this area committed to these patients not be pregnant, but there is evidences that these patients had a successful pregnancy with special medical treatment (16,17). According to the texts and articles, contraindications to pregnancy include severe pulmonary hypertension or Eisenmenger's syndrome, cardiomyopathy with New York Heart Association (NYHA) Class III or IV symptoms, history of peripartum cardiomyopathy, severe uncorrected valvular stenosis, unrepaired cyanotic congenital heart disease, and

Marfan syndrome with an abnormal aorta (18).Women with aortic mild or moderate mitral stenosis or history of previous heart surgery are able to tolerate pregnancy with regular treatment and accurate prenatal care (19). It is difficult for a pregnant woman to tolerate severe form of MS and AS, abortion therapy is usually suggested (13, 14, 20). A healthy woman without any cardiovascular disability will arise the risk of coronary heart disease about 2 times and Ischemic heart disease about 1/5 times when her pregnancy is complicated with hypertension (21) obviously it will be more dominant in the presence of cardiovascular disorders (1). Normal vaginal delivery (NVD) is the best choice for pregnant women with cardiovascular disease; caesarean sections were mainly due to fetal distress diagnosed by abnormal fetal heart rate patterns (22). High cardiovascular changes may occur during labor and delivery (both method). Less amount of bleeding during NVD comparing to cesarean delivery changes it into the preferred delivery method. In this study, cesarean delivery was more common that may be related to insufficient placental perfusion (11, 12, 20). In this study the most common heart diseases along with pregnancy and hypertension was moderate AS, besides MPV was in the second rank and moderate MS+MR and moderate MVP+MR were both the third. Heart failure, hypertension, and tachycardia were the three essential complications during pregnancy which were similar to the results of Nagshbandi and his co-workers study in Sanandaj, 2004 (17). Another study in America (2000) showed a high incidence of MVP during pregnancies attacked by preeclampsia in which tachycardia was prominent and cases had been treated by propranolol; these patient may also experience high stress, tremor and chest pain (13).In our study we found only one person with sever preeclampsia with ejection fraction <40 %. We had one pregnancy with pulmonary stenosis which leads to a live birth with HMD who died after five days. Mean of birth weight was 1790/62 $\pm$310/24 which approves the direct relation among heart disease; preeclampsia, intra uterine growth retardation (IUGR) and low birth weigh (LBW) which is compatible with increased peripheral resistance and atherosclerosis in theses population (23). In Canada results of a research indicated that neonatal morbidity and mortality was 18% in pregnancies with heart disease comparing to 7% in normal pregnancies; besides, birth weight was about 700grs lower in the first group (22).Results of recent study are vital representatives of pregnancy complications which leads to preterm labor, low birth weight, still birth, low apgar score and fetal brady cardia in pregnancies having two major effecting factor (6,24). However, to establish these facts require to be done a cohort study by considering the maternal outcomes after delivery to highlight latter maternal disabilities.

Considering the underlying risk factors of heart disease and early detection of confounding conditions will play a great role in controlling the onset and reducing the mortality of these patients during pregnancy; giving a clear insight of pregnancy outcomes to women with heart disease and improving their knowledge by regular consultation and training classes will have a great role in controlling morality and future morbidity .Cardiac risk factors such as prior cardiac events, prior arrhythmia, NYHA III or IV or cyanosis, valvular and outflow tract obstruction ,myocardial dysfunction ,congestive heart failure ,congenital heart defect and maternal risk factors advanced maternal age, lifestyle choices medical history underlying conditions ,chronic conditions, such as diabetes, high blood pressure and epilepsy, increase pregnancy risks. A blood condition, such as anemia, an infection or an underlying mental health condition also can increase pregnancy risks (24, 25). It seems it is necessary for cardiovascular screening of all women in reproductive age due to the high maternal and fetal mortality and morbidity. International American heart institute suggests that any women with even a slight heart disease should obey a special life style to combat the disorder which can come true by sufficient and

regular training, support and health improvement programs; there are a series of health advices to help this group as below:

1-It is better for pregnant mothers with heart disease and high risk of hypertension to use calcium, Vitamin C and Aspirin from their second trimester of pregnancy as a mean of reducing maternal and fetal disabilities.

2-It is better to have valvuloplasty in cases with valve stenosis before pregnancy.

3-Balloon valvuloplasty is recommended for sever valve disease during pregnancy to prevent more unwanted outcomes.

4-Mothers with mild and severe MS and AS should be regularly monitored for fetal and maternal well being (12, 13).

5-Checking blood pressure, avoiding hyper lipemia, taking Folic Acids and Vitamin B6, and brisk walk 3-5 times a week, prescribing antioxidants (Vita E, C,etc) and stopping cigarette use are series of preventive programs (1, 26).

Conflict of interest statement:

We declare that we have no conflict of interest.

Acknowledgments:

Great thanks to Mrs Afsari and Mrs Tavana head of medical records units in Alzahra and Emam Reza Hospital who help us in data collection.

References:

1.Newstead J, von Dadelszen P, Magee LA. Preeclampsia and future cardiovascular risk. Expert Rev Cardiovasc Ther. 2007; 5(2): 283-94.

2.MacGillivray, I. Epidemiology and overview of hypertension in pregnancy. In Gynaecology Forum 2000; 1(4), 3-5.

3.Malberg H, Bauernschmitt R, Voss A, Walther T, Faber R, Stepan H, Wessel N. Analysis of cardiovascular oscillations: a new approach to the early prediction of pre-eclampsia. Chaos. An Interdisciplinary Journal of Nonlinear Science, 2007; 17(1): 015113-015113.

4.Pipkin FB.Risk factor for preeclampsia. N Engl J Med 2001; 344(12):925-6.

5.Cantwell R, Clutton-Brock T, Cooper G, Dawson A, Drife J, Garrod D et al. Saving Mothers' Lives: Reviewing maternal deaths to make motherhood safer: 2006-2008. The Eighth Report of the Confidential Enquiries into Maternal Deaths in the United Kingdom. BJOG: an international journal of obstetrics and gynaecology 2011; 118(11): 1402-3

6.Anderson CM. Preeclampsia: exposing future cardiovascular risk in mothers and their children. J Obstet Gynecol Neonatal Nurs. 2007; 36(1): 3-8.

7.Poole JH. Hypertension disorder in pregnancy. In : Lowdermilk DL.:Perry Se.:Bpbak IM. Maternity and womens Health cares: From Mosby.Phiadelphia: USA,816-7,2000.

8.Liouyd C.:Lewis VM. Hypertension disorder of pregnancy. In:Bennette VR.;Brown LK.Mylse Textbook for midwifes :From Churchill Livingston.Edinburgh:UK.318-21,1999.

9.Scott R. Disaia G and Harmond B. Danforth's obstetrics and gynecology.10 th ed, New York Williams and wilkins , 1999:336-32.

10.Manten GT, Sikkema MJ, Voorbij HA, Visser GH, Bruinse HW, Franx A. Risk factors for cardiovascular disease in women with a history of pregnancy complicated by preeclampsia or intrauterine growth restriction. Hypertens Pregnancy. 2007; 26(1): 39-50.

11.Cuningham F, Gantfamd leveno J. Williams obstetrics. 22 St ed, New York: Mc Graw.Hill 2001: 1181-1203.

12.Alicia D and rado E. study of pregnancy risk to women with near valve disease.J of Cadiology 2002; 62: 17-24.

13.Conde Agudelo A , belizan JM: Risk Factors for pre eclampsia in a large cohort of Latin American and Carribean women Br J obstet Gynaecol 2000; 107(1): 75-83.

14.Al Kasab SM, Sabag T, Al Zaibag M et al. β-adrenergic receptor blockade in management of pregnant patients with mitral stenosis. Am J Obstet Gynecol 1990; 163(1): 37-40

15.Cruickshank JM. Beta blockers in hypertension .Lancet. 2010; 376(9739): 415.

16. Ramondo A, Barchitta A, Budano L, Lupia M, Chioin R, Mitral valvuloplasty in pregnancy: a report of 4 Cases. Giornale italiano di cardiologia 1998; 28(8): 873-877.

17.Naghsh Bandi M, Shah Gheibi Sh,The prevalence of cardiovascular disease and its effect on pregnancy outcome in pregnant women,Scientific Journal of Kurdistan University of Medical Sciences 2003; 8(29): 33-40 .

18.Sermer, M., Harrison, D. A., Grigoriadis, E., Liu, G., Sorensen, S., Smallhorn, J. et al Risk and predictors for pregnancy-related complications in women with heart disease. Circulation 1997; 96(9): 2789-2794.

19.Yaghoubi A and et al, Pregnancy and Bioprosthetic Valve Survival: Concerns About Birth Defects J Cardiovasc Thorac Res 2009; 1 (1): 23- 27.

20.Evangelico d, Curitiba R and Curitibap. Catheter cadio vascular intervention, American J of cardiology 2002; 62:17-24.

21.Baumwell S, Karumanchi SA. Pre-eclampsia: clinical manifestations and molecular mechanisms. Nephron Clin Pract. 2007;106(2):72-81.

22.John F. Setaro, Teresa Caulin-Glaser.Medical Complications During Pregnancy (Sixth Edition), Chapter 6 Pregnancy and Cardiovascular Disease 2004; 103-129.

23.Belmin j. Prevention of cardiovascular disease in elderly. Press Med 2000; 24:1234

24.Siu SC, Sermer M, Colman JM, Alvarez AN, Mercier LA, Morton BC. Prospective multicenter study of pregnancy outcomes in women with heart disease. Circulation. 2001; 104(5) 515-521.

25. Dwyer BK, Taylor L, Fuller A, Brummel C, Lyell DJ. Percutaneous transluminal angioplasty and stent placement during pregnancy. Obstet Gynecol. 2005; 106(5 pt 2): 1162-1164.

26.von Dadelszen P, Menzies J, Gilgoff S, Xie F, Douglas MJ, Sawchuck D, Magee LA. Evidence-based management for preeclampsia. Front Biosci. 2007; 12(5): 2876-89.