OUT COMES OF PRENANCY IN LIBYAN PATIENTS WITH VALVULAR HEART DISEASES

Tripoli Medical Centre Tripoli/Libya 2014-2018

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Introduction:

Heart disease in pregnancy has an incidence of 0.2%-0.4%, and is the most frequent cause of maternal death in developed countries [1,2],Cardiac disease in the pregnant patient can present challenges in cardiovascular and maternal-fetal management.Since pregnancy carries dramatic physiologic changes upon the cardiovascular system even in normal women,these changes (Tab 1) begin in the first 5 to 8 weeks of gestation and peak late in the second trimester. Blood volume increases 40% to 50% during normal pregnancy also cardiac output rises 30% to 50% above baseline, peaking at the end of the second trimester and reaching a plateau until delivery. In cardiac patients the decompensation often coincides with this peak. Pregnancy is a hypercoagulable status in which pregnant women are susceptible to arterial thromboembolism 3 to 4 times more likely to have, and 4 to5 times more likely to have venous thromboembolism as compared with non-pregnant women.Hypercoagulable status increases the incidence of mechanical valve thrombosis from 7 to 23%,half of these cases are Mitral valve cases[3].With the increasing the number of patients with prosthetic valves, there aremore pregnant ladies with prosthetic valves , in spite of the fact that asymptomatic ladies with prosthetic valves tolerate the pregnancy [4,]however, the complications due to the use of anticoagulant treatment during pregnancy make the use of biological valves is superior than the mechanical one [3,5]In the developing countries, rheumatic heart disease (RHD) is the most common cardiac disease in pregnantwomen, and the most important cause of maternal death[6,7].Moderate to severe mitral valve stenosis cases in particular is a high-risk[8], in 2007 ESC launched an internationalRegistry On Pregnancy and Cardiac Disease (ROPAC) [9,10], which showed significant difference between developed and developing countries. It

showed that valvular heart disease (VHD) is more common in developing countries, congenital heart disease is more common in developed countries. Moreover, the mortality rate is higher in developing countries among maternal and fetal[10]. Thesedifferences reflect the level of medical care in developedand developing countries. In developed countries, optimalcare and preconception counseling were available in allcenters, but few whereas

women in developing countries who hadheart disease were assessed and appropriately counseledbefore conception[10,11]This study is the first kind of national study in Libya , it explain the cardiac experience with the management of pregnant ladies with VHD aiming to know our limits, mistakes in this field .

Hemodynamic Parameter	Change During Normal Pregnancy	Change During Labor and Delivery	Change During Postpartum
Blood volume	↑ 40%-50%	↑	↓ (autodiuresis)
Heart rate	↑ 10-15 beats/min	↑	↓
Cardiac output	↑ 30%-50%	↑ Additional 50%	↓
Blood pressure	↓ 10mmHg	↑	↓
Stroke volume	↑ First and second trimesters; ↓ third trimester	↑ (300-500mL per contraction)	↓
Systemic vascular resistance	↓	↑	↓

Table 1: Normal Hemodynamic Changes During Pregnancy

Method:

Retrospective analysis of medical records of 35 pregnant patients (aged between 25 and 45 years old) withvalvular heart disease, they were followed up throughout their pregnancy up to their delivery ,with focus on the medical condition of the mothers , in both valve clinic and anticoagulants clinics at Tripoli Medical Center (Tertiary referred center in the capital Tripoli), both clinics are specialized

clinics established on 2012 following up and managing patients with VHD & patients with mechanical prosthetic valves, and both are referral place for patients from Tripoli and outside Tripoli.Data was collected in a predesigned data case sheet from the records of registered patientsbetween the beginning of year 2014 and March 2018. All patients included in the analysis hadhistory (age, parity, cardiac diagnosis, previous interventions, medication, diabetes mellitus, hypertension, obstetric history)and physical examination findings documented in the chart. Routine investigation performed including 12 lead ECG, full Trans-thoracic 2–dimensional echocardiography examination, performed by the same operator using Vivid 7 GE machine using all available modalities (M–mode, two-dimensional{2D}, and Doppler). The echocardiography protocol is based on the recommendations and the guidelines of the American Society of Echocardiography[27].14.2% of patients in addition to transthoracic echocardiography (TTE) had also Trans-esophageal echocardiography (TEE) for further assessment when the clinical indications arise. The severity of the valve lesions classified according to the European Society of Cardiology (ESC)guidelines[28]. A maternal cardiac event was defined as cardiac death, new onsetarrhythmia requiringtreatment, heart failure, thromboembolic event, endocarditis,hospitalization, or a cardiac intervention. The collected data coded, and SPSS software version 21 used for the analysis, mean SD, frequency and percentages used to describe the data.

Result:

35 Libyan pregnant ladies with non congenital valvular heart diseases followed in our clinic. All the cases wereRheumatic heart disease(RHD)cases; most of the cases (74.3%) were from outside the capital. The youngest patient was aged 25yrs old, and the oldest 45years old. 57.1% of the patients were in the 4th decade. Seven patients (20%) had prosthetic mechanical valve replacements. Most of the patients (77.1%) started thefollow up with us during their 2ndtrimester. Regarding the presentingsymptom, 68.6% of patients were asymptomatic, 20% presented had dyspnea, and 5.7% had palpitation and dyspnea.None of the patients haddiabetes mellitus (DM),systemic arterial hypertension (HPT),or anemia. Regarding the type of valves lesion detected in this series mild mitral regurgitation(MR) had the highest percentage(34.3%), followed

by mild aortic regurgitation (AR)(28.6%). 8.6% hadsevieremitral stenosis (MS) and 2.9% had severeaortic stenosis (AS).34 patients (97.14%) had normalejection fraction (EF)(> 50 %), and only one patient had EF range in between40-49% (2.8% of patients). 54.3% of patient did not need any medical treatment during their pregnancy, while 37.1% were on medical treatment (Diuretic , B-blocker, Aspirin), and 8.6% underwent mitral valvoplastydue to severe mitral stenosis (MS), and the procedure done in their 2nd trimester. One patient (2.8%) developed infective endocarditis,four patients (11.42%) had developed heart failure, three of them (75%) had severe mitral stenosis (MS) and one patient had Moderate mitral stenosis (MS). One patient had acute valve thrombosis. None of the including patients had new onset of arrhythmia. 21 patients (60.1%) delivered by normal vaginal delivery, Cesarean Section(C/S)performed for 9 patients (25.7%), and dilation and curettage (D&C) done to 3 patients (8.5%) because of spontaneous abortion. All the aborted patients had mechanical valves.After delivery, 57.1% of patients were followed up without medical treatment, 31.4% put on medical treatment, and valve replacement surgeryadvised for 8.6%. We lost two patients (5.7%), both were from outside Tripoli,one had mitral valve replacement (MVR) died in her 3rd trimester due to acute valve thrombosis,and the second case was died in her 2nd trimester due to infective endocarditis (IE)& septic shock. All of our patients who delivered had normal babies, andstill on regular fellow up in both valve and anticoagulant clinics.

Character	*Frequency*	*Percent*
Address		
Tripoli	9	25.7
Outside Tripoli	26	74.3
Age		
25-29	7	20.0
30-35	13	37.1
36-40	7	20.0
41-45	8	22.9
Trimester		
First	0	0.0
Second	34	97.1
Third	1	2.9

Table (2) distribution of Libyan pregnant ladies with VHD by personal character

Character	Frequency	Percent
Main complain		
Dyspnea	7	20.0
Palpitation	2	5.7
General fatigue	2	5.7
Asymptomatic		68.6
	24	
EF		
40-49%	1	2.8
≥50%	34	97.14
Valve affected		
Aortic	18	51.4
Mitral	22	62.8
Pulmonary	1	2.9
Advice during pregnancy		
Valvoplasty	3	8.6
Medical treatment	13	37.1
Follow up without medical treatment	19	54.3
Advice after pregnancy		
Follow up without medical treatment	19	54.3
Follow up with medical treatment	11	31.4
Surgery	3	8.6

Table(3) distribution of Libyan pregnant ladies with VHD by cardiac data:

Character	Frequency	Percentage
Heart failure	**4**	**11.42**
Arrhythmia	**0**	**0**
Thromboembolism	**1**	**2.8**
Infective endocarditis	**1**	**2.8**

Table (4) distribution of pregnant ladies with VHD by cardiac complication

Character	Frequency	Percentage
Normal vaginal delivery	**21**	**60.1**
Cesarean section	**9**	**25.7**
Abortion	**3**	**8.5**
Death	**2**	**5.7**

Table (5) distribution of pregnant ladies with VHD by outcomes of pregnancy

Discussion:

Unfortunately in Libya we had no previous studies interested in the cardiac disease among pregnant ladies, but during this study which is the first study held in Libya, we found that all the cases were Rheumatic heart disease (RHD),and these finding matched that in other developing countries in which Rheumatic heart disease(RHD)caused 72% of all heart diseases in pregnancy, and it is amajor non-obstetric cause of maternal death [10,12,13,14] . In Saudi Arabia RHD was responsible for 75.9% of all pregnant cardiac cases[15], and in Egypt it represented 66.7% of the cases[16], unlike that in western countries, where the congenital heart diseases represent the most common cause of heart disease in pregnant ladies [22,23]Most cases of maternal death during pregnancy in the UK caused by myocardial disease, pulmonary hypertension and myocardial infarction, and those due to valvular disease was rare, and mostly due to infective endocarditis[24]. Because of the predominance of degenerative valvular disease in western countries, there is a dramatic decrease in the prevalence of severe heart valve disease in young women [25],

Inour study we found that predominant valve was mitral valve, and this result was seen in Senegal, where the RHD accounts for 94% of the cases and mitral valve was the dominant valve lesion [26], unlikewhat had been seen in Brady K. result, who illustrated that mitral stenosis is the most common RHD lesion in pregnancy in developing countries.17. Mitralregurgitation was the predominant valve lesion in our study (34% of the cases), most of our patientswere from outside the capital and this shows the lack of cardiac coverage for the pregnant ladies in those areas (rural).

11.42 % of our patients had heart failure and this figure is near that observed in India, where Koregol et al found that 10.9% of the pregnant ladies developed pulmonary edema during pregnancy [18]whereas itis higher than that in Egypt,

where only 4.9% of the cases developed heart failure[16]

Only one case (2.8%) developed valve thrombosis, while in Egypt the ratio was 0.8%[16]. and 2.2% as shown in Stangl et al study [19]

In our study there is no cases with arrhythmia and this result disagree with that seenbyKoregol et al[18]where the ratio of arrhythmia was 2.7% , and 0.8% in Egypt[16] .

Infective endocarditis in our study was 2.8%. In disagreement with our results Stanglet al[19]andEgypt which showed that the ratio of infective endocarditis was 0.0%[16], While Avila et al.[20] found that the incidence was 0.5%. , and lower than that seen in India where the ratio was 4.5% as Koregol et al[18]

Our maternal mortality rate was 5.7%, which was higher than studies from Egypt which was 3.3% [16], India which was 3.6 % [18]and in study done by Stangl et al whichwas 1.1% [19]

60.1% of our patients were delivered by normal vaginal delivery and 25.7% by cesarean section, while in Egypt it was 54.5% of cases were delivered vaginally[16], while 45.5% were delivered by C/S 26.5% [16]. In India 72.8% delivered vaginally, while 27.2 % delivered by CS [18]. Avila et al[20] reported that 65% delivered vaginally and 35% by CS. The results collected by the Eurobservational Research Program 2010 found vaginal delivery represented 54%, and cesarean46% [21]

Conclusion:

Lack of the medical education of the pregnant patients with VHD, deficiency of primary health care units in periphery, and miscommunication and miscooperationbetween cardiologist and obstetrician, lead to a large numbers of complications, abortionfor instant.

Recommendation:

preconceptioncounseling, early regular follow up with cardiologist and full cooperation between cardiologist &obstetrician are needed for improving the outcomes of the patients of VHD intheir pregnancy.

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