

Evaluation of Valvular Heart Outcomes and Its Impact on Iraqi Women and the Newborn Fetus

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Abstract: *Background:* Numerous unfavorable obstetric outcomes have been connected to valvular heart disease when combined with the considerable hemodynamic changes of pregnancy. *Aim:* This paper was objective to evaluate of valvular heart outcomes and its impact on Iraqi women and the newborn fetus. *Patients and methods:* The databases were organized from different hospitals in Iraq between 16th March 2021 to 18th April 2022. This study was encouraged to evaluate of valvular heart outcomes and its impact on Iraqi women and the newborn fetus. In the methodology of the study, this study was interested as a cross-sectional study into identifying of women and newborn fetus under the ages of 25-40 years for 80 patients. This study was divided into two groups which are the Mechanical group (40) and the Bioprosthetic group (40). This paper was analysed the databases outcomes by the SPSS program. *Results and discussion:* We compared the maternal and fetal results of pregnancy with mechanical vs. bioprosthetic heart valves utilizing a nationally representative sample of patients who had previously undergone valve replacement. MHVs were present in almost 60% of those who had prosthetic limbs. Patients with any kind of prosthesis had nearly 15 times the probability of developing MACE compared to the general pregnant population, as well as longer hospital stays and higher healthcare expenses. Even after adjusting for baseline variables, the probability for MACE and any other adverse maternal event remained equal between those with MHVs and BHVs. Both valve types had a comparable risk of prenatal problems, such as congenital abnormalities and stillbirth. Several of these conclusions need for more elaboration. *Conclusion:* Our study found no big difference between the mechanical group and the bioprosthetic group, where mechanical group complications were higher than the bioprosthetic group in maternal and fetal outcomes. The disadvantages result of analyses 95 CI were related to mechanical more than bioprosthetic.

Keywords: Maternal and newborn fetus outcomes; Bioprosthetic group; and Mechanical group.

INTRODUCTION

Numerous unfavorable obstetric outcomes have been connected to valvular heart disease when combined with the considerable hemodynamic changes of pregnancy (Siu, S.C., 2001; Drenthen, W., *et al.*, 2010; Roos-Hesselink, J.W. *et al.*, 2013; Canobbio, M.M. *et al.*, 2013). Preconception valve replacement is advised for persons of reproductive age who have symptoms of valvular heart disease. Currently, replacement valves can be mechanical or bioprosthetic (usually made from bovine or porcine tissue), each having certain benefits and disadvantages. Bioprosthetic valves don't need long-term anticoagulation, but young patients' faster structural degeneration makes an early reoperation necessary.

For patients under 65 (American College of Obstetricians, 2019; Otto, C. M. *et al.*, 2020; Chiang, Y. P. *et al.*, 2014; MacIsaac, S. *et al.*, 2019), the more resilient mechanical valves are now advised because to their potential long-term mortality advantage over bioprosthetic valves. However, mechanical valves must be treated with

lifelong anticoagulation using vitamin K antagonists due to a higher risk of thrombosis, which raises questions regarding bleeding and teratogenicity during pregnancy (Goldstone, A. B. *et al.*, 2017; Hung, L., & Rahimtoola, S. H. 2003; Elkayam, U. and Bitar, F. 2005; Hameed, A. *et al.*, 2001; Batra, J. *et al.*, 2018; Van Hagen, I. M. *et al.*, 2015).

Given these factors, it's crucial to choose prosthetic heart valves wisely, especially for women of childbearing age who are thinking about getting pregnant. There is currently no agreement on the best valve option that will reduce danger to both the mother along with the fetus. Recent studies have demonstrated that compared to mechanical valves; bioprosthetic valves represent a lower risk of thrombosis, hemorrhage, and overall maternal and fetal mortality. Large-scale data are still unavailable, and the breadth of the investigations that are now accessible is small (NIS Description of Data Elements, 2019;

Kuklina, E. V. et al., 2008; Lima, F. V. et al., 2015; Thomas, E. et al., 2017).

To our knowledge, the most comprehensive series on this subject to date only looks at a cohort of 417 people. To describe this connection, the current cross-sectional study was conducted among pregnant inpatients throughout the United States. We predicted that previous valve replacement, especially with mechanical valves, would result in longer hospital stays, higher expenses, and more difficulties for both the mother and the fetus (Garovic, V. D. et al., 2020; Theilen, L. H. et al., 2016). This paper was objective to evaluate of valvular heart outcomes and its impact on Iraqi women and the newborn fetus.

PATIENTS AND METHODS

The databases were organized from different hospitals in Iraq between 16th March 2021 to 18th April 2022. This study was encouraged to evaluate of valvular heart outcomes and its impact on Iraqi women and the newborn fetus. In the methodology of the study, this study was interested as a cross-sectional study into identifying of women and newborn fetus under the ages of 25-40 years for 80 patients. This study was divided into two groups which are the Mechanical group (40) and the Bioprosthetic group (40). This paper was analysed the databases outcomes by the SPSS program.

To follow up of methodology, this study was showed clinical, demographic characteristics of valvular heart outcomes for Iraqi women patients for ages between 25-40 years for 80 patients. Moreover, this study was identified of clinical characteristics comorbidities of valvular heart outcomes for Iraqi women patients where these parameters included Chronic diabetes, Chronic hypertension, Obesity, Chronic pulmonary disease, Coagulopathy, Rheumatoid arthritis, Anemia,

RESULTS

Table 1: Clinical, demographic characteristics of valvular heart outcomes for Iraqi women patients.

N	V	80
	Mi	0
M		32.5000
SEM		.51864
Me		32.5000
Mo		25.00 ^a
SD		4.63886
Var		21.519
Ra		15.00
Min		25.00
Max		40.00
S		2600.00

Liver disease, renal disease, and Hypothyroidism which these parameters were figure out in Figure 1. Also, this study was identified of heart diseases for valvular heart outcomes for Iraqi women patients, which are chest pain, fatigue, persistent cough, Rapid heart rate, and severe shortness of breath. Where these parameters can be found in Table 2. In addition, this study was determined of operative types of pregnancy, which include Cesarean birth, Multiple gestation, and Elective admission, where these types can be expression in Figure 2.

To further of outcomes, our study was Organizing of Maternal complications outcomes in comparison of the Mechanical group and Bioprosthetic group, which get on Gestational diabetes, Hypertensive disease of pregnancy, Preterm premature rupture of membranes, Placental abruption, Chorioamnionitis, Respiratory complications, Blood transfusion, and Acute kidney injury where these complications were defined in Figure 3. Moreover, this study was also Organizing of fetal complications outcomes in comparison between the Mechanical group and the Bioprosthetic group, which was determined into Congenital anomalies, Poor fetal growth, Preterm birth, and Stillbirth, which these results have been identified in Figure 4.

This paper was determined into Maternal Outcomes in comparison between the Mechanical group and Bioprosthetic group, which include BMI <30 and >30, haemorrhage which have antepartum haemorrhage and postpartum haemorrhage, also, Length of stay, d which can be shown in Table 3. Finally, this paper has found with analysis factors of multivariate logistic regression of aOR (95% CI) affecting for women and the newborn fetus, which can be determined in Table 4.

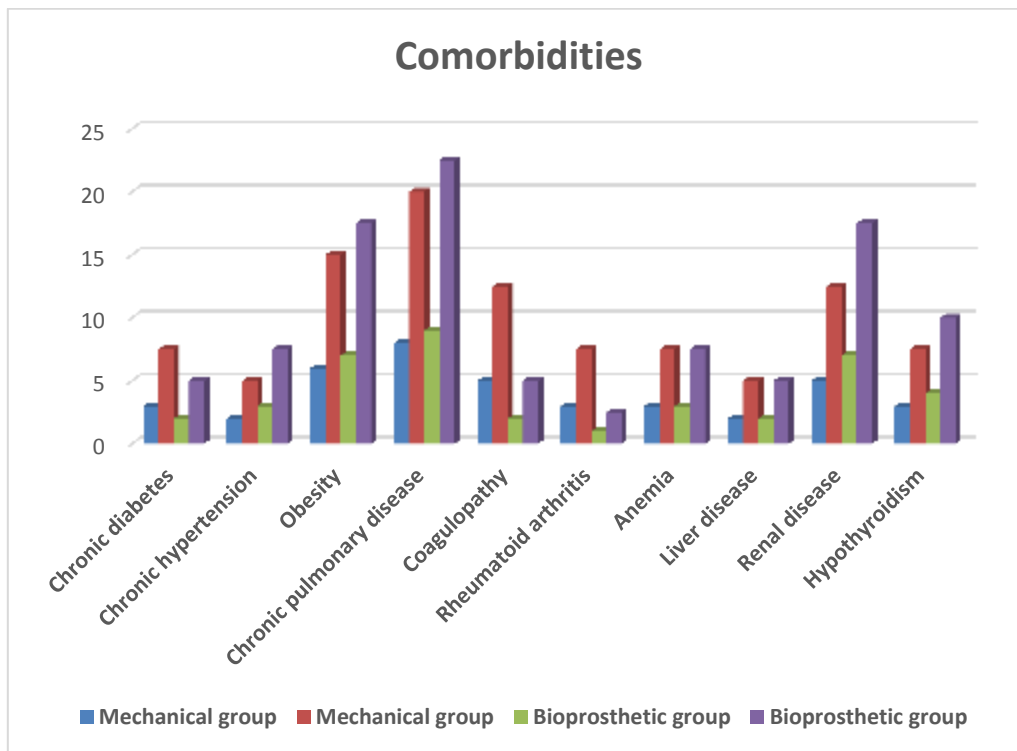


Figure 1: Identify of clinical characteristics and comorbidities of valvular heart outcomes for Iraqi women patients.

Table 2: Identification of heart diseases for valvular heart outcomes for Iraqi women patients.

		<i>F, 80</i>	<i>P (%)</i>	<i>VP (%)</i>	<i>CP (%)</i>
<i>V</i>	<i>Chest pain</i>	24	30.0	30.0	30.0
	<i>Fatigue</i>	10	12.5	12.5	42.5
	<i>Persistent cough</i>	11	13.8	13.8	56.3
	<i>Rapid heart rate</i>	17	21.3	21.3	77.5
	<i>Severe shortness of breath</i>	18	22.5	22.5	100.0
<i>T</i>		80	100.0	100.0	

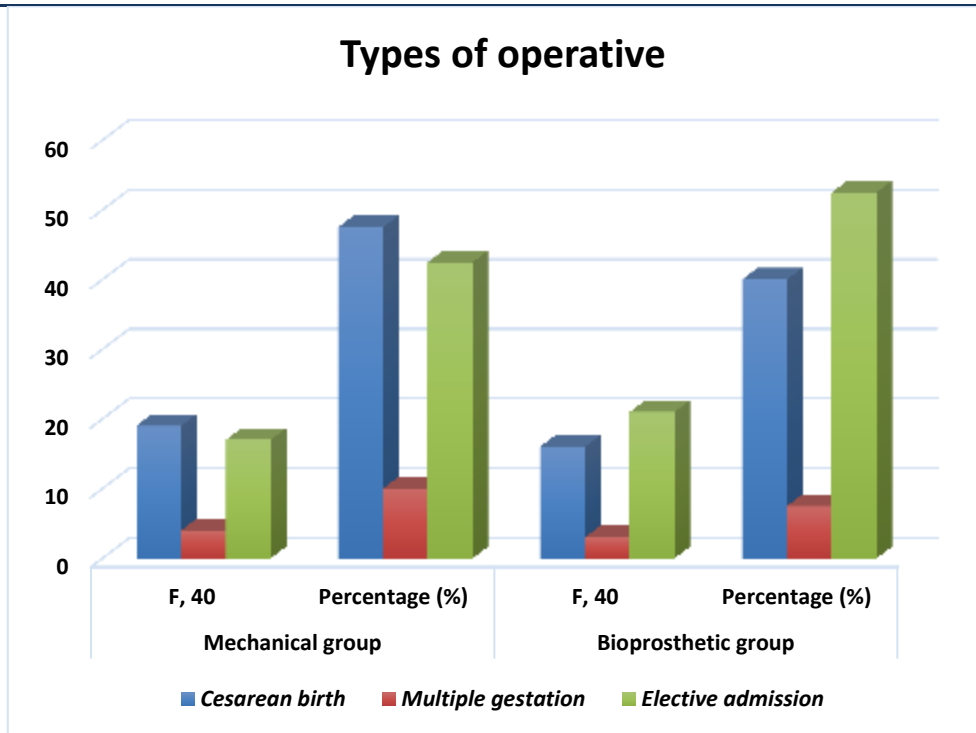


Figure 2: Determination of operative types of pregnancy.

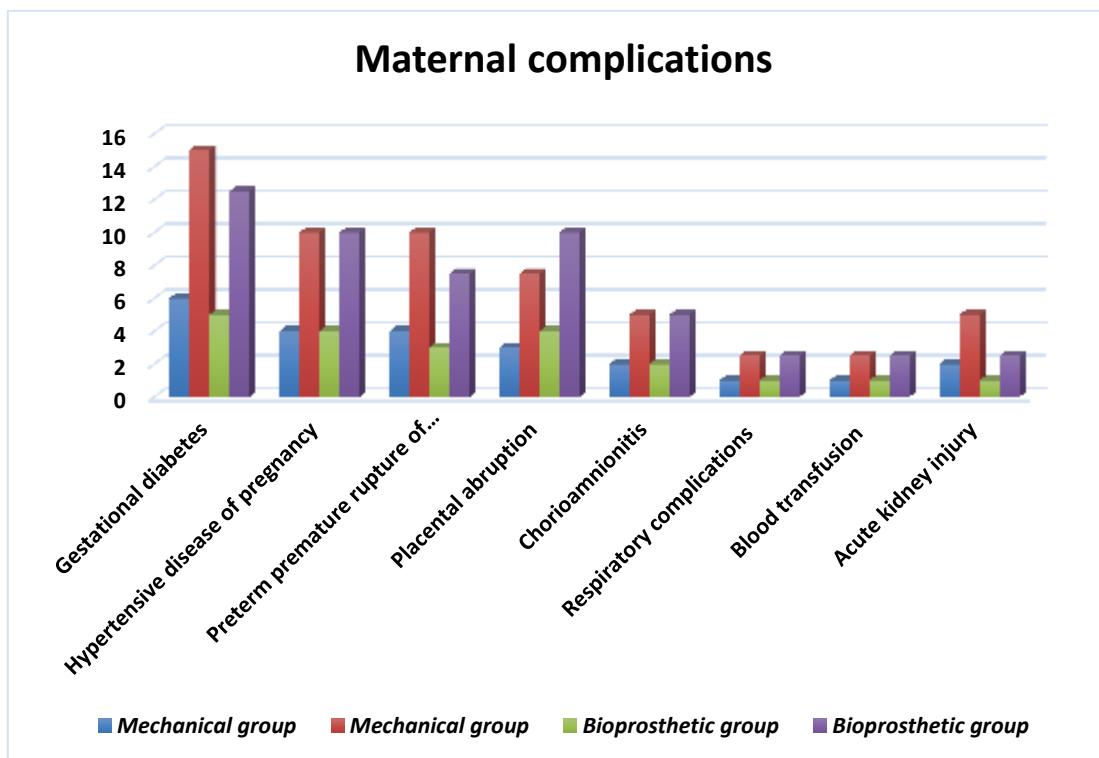


Figure 3: Organizing of Maternal complications outcomes in comparison between the Mechanical group and the Bioprosthetic group.

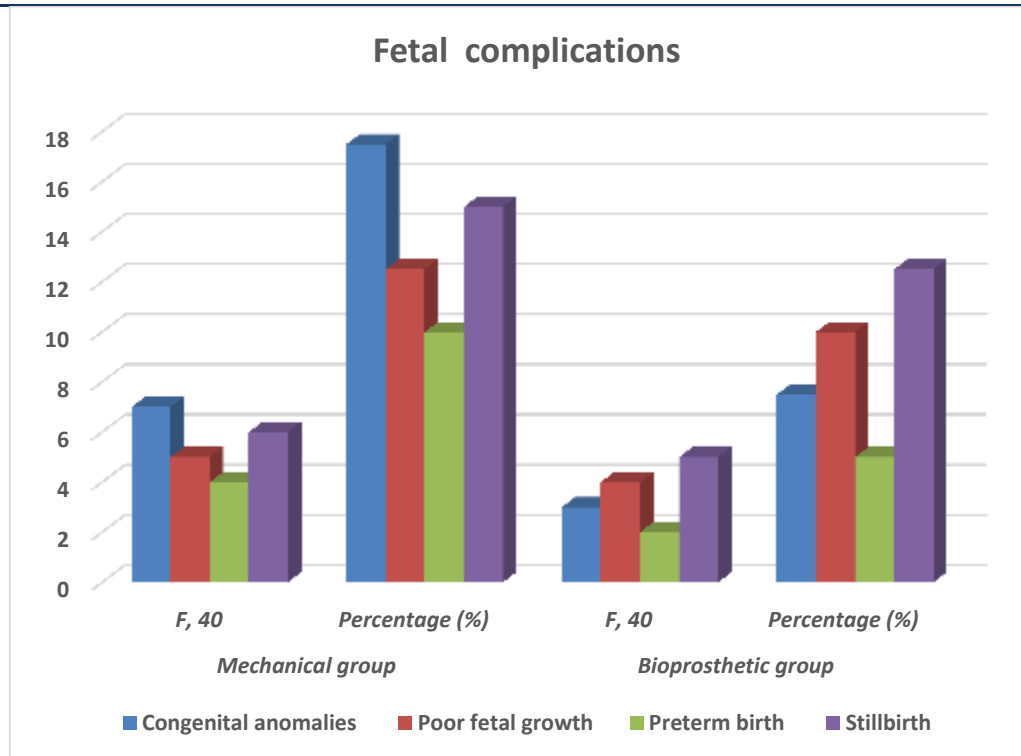


Figure 4: Organizing of fetal complications outcomes in comparison between the Mechanical group and the Bioprosthentic group.

Table 3: Maternal Outcomes in comparison between the Mechanical group and Bioprosthentic group.

Outcomes	Mechanical group, 40	Bioprosthentic group, 40	P-value
BMI			
<30	14 (35%)	18 (45%)	0.03124
>30	26 (65%)	22 (55%)	0.0334
haemorrhage			
Antepartum haemorrhage	21(52.5%)	28 (70%)	0.0265
post-partum haemorrhage	19 (47.5%)	12 (30%)	0.0237
Length of stay, d	4.3 ± 1.24	3.5 ± 0.76	0.0358

Table 4: Analysis factors of multivariate logistic regression of aOR (95% CI) affecting for women and the newborn fetus.

Parameters	Mechanical group, 40	Bioprosthentic group, 40	P-value
Age	4.6 (2.33-8.54)	1.42 (0.42-4.18)	0.0351
Symptoms			
Chest pain	6.77 (4.8-9.64)	5.81 (4.73-7.19)	0.447
Rapid heart rate	4.58 (3.62-7.11)	2.647 (0.66-4.57)	0.024
Severe shortness of breath	5.57 (2.36-8.89)	3.76 (1.643-6.821)	0.0426
Comorbidities			
Chronic diabetes	2.64 (1.68-5.33)	1.93 (0.33-6.63)	0.0377
Chronic hypertension	3.85 (1.54-6.814)	2.44 (1.32-4.717)	0.0364
Obesity	5.64 (2.74-8.90)	3.62 (0.87-6.53)	0.03681
Chronic pulmonary disease	3.72 (1.635-5.78)	4.61 (2.55-7.84)	0.0352
Complications			
Gestational diabetes	9.46 (7.5-15.61)	15.144 (12.66-20.45)	0.0225
Hypertensive disease of pregnancy	11.46 (9.64-21.65)	16.35 (10.774-24.82)	0.0413
Congenital anomalies	5.82 (3.67-8.45)	5.358 (4.58-8.35)	0.03684
Poor fetal growth	6.83 (1.43-8.66)	7.89 (4.46-14.73)	0.0315
Stillbirth	8.47 (5.48-11.675)	5.722 (3.94-10.35)	0.0362

DISCUSSION

We compared the maternal and fetal results of pregnancy with mechanical vs. bioprosthetic heart valves utilizing a nationally representative sample of patients who had previously undergone valve replacement. MHVs were present in almost 60% of those who had prosthetic limbs. Patients with any kind of prosthesis had nearly 15 times the probability of developing MACE compared to the general pregnant population, as well as longer hospital stays and higher healthcare expenses. Even after adjusting for baseline variables, the probability for MACE and any other adverse maternal event remained equal between those with MHVs and BHVs. Both valve types had a comparable risk of prenatal problems, such as congenital abnormalities and stillbirth. Several of these conclusions need for more elaboration (Medical Expenditure Panel Survey, 2022: Livingston, E. H. *et al.*, 2009).

The likelihood of negative maternal outcomes, such as MACE and ante/postpartum haemorrhage, did not significantly differ between patients with MHVs and BHVs, which is an interesting finding. Although earlier research suggested that BHVs may reduce the incidence of bleeding and valve thrombosis in expectant women, these studies are now out of date and have a small sample size, and lack generalizability. Our study is better equipped to account for variation between institutions and patient categories thanks to the use of a nationwide cohort and pragmatic sampling of NIS. Although long-term warfarin anticoagulation has typically been associated with MHV, current research has indicated a rising tendency of both MHV and BHV patients using direct-acting oral anticoagulants, suggesting that pregnant patients should proceed with caution when considering any anticoagulation regimen (Cuzick, J. A. 1985).

In addition, different adverse effects could be caused by more recent mechanical valve types that need less anticoagulant medication. For instance, compared to 2.5 for traditional bileaflet and tilting disc valves, the 2017 American College in Cardiology/American Heart Association recommendations recommend an international normalized ratio range of 1.5-2.0 for the On-X aortic valve. Contradictory advice is offered in two additional well-known guidelines from the European Society of Cardiology and the American College of Chest Physicians. The absence of standardized treatment is a major problem with the administration of prosthetic valves in pregnancy

[24]. To further comprehend and standardize anticoagulation, more research is required. The mechanical group's complications were greater than the bioprosthetic groups in terms of maternal and fetal outcomes, but our study did not find a significant difference in outcomes between the mechanical group versus the bioprosthetic group. The 95 CI results showed mechanical issues were more problematic than bioprosthetic ones.

CONCLUSION

Our study found no big difference between the mechanical group and the bioprosthetic group, where mechanical group complications were higher than the bioprosthetic group in maternal and fetal outcomes. The disadvantages result of analyses 95 CI were related to mechanical more than bioprosthetic.

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