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Research Article

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Kaplan-Meier Survival Curve and Assessment Result Health of Patients Treating Complicated Aortic Infective Endocarditis

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Abstract: Introduction: Infective endocarditis (IE) is a disease that develops because of infection located in the endocardium valves (most common), the ventricles and atria, the lining of the great blood vessels of the chest, vascular connections, or foreign bodies within the heart. **Objective:** This paper aims to evaluate the Kaplan-Meier survival curve and assessment results of the health of patients treating complicated aortic infective endocarditis. **Patients and methods:** This paper was shown as a cross-sectional study to evaluate the Kaplan-Meier survival curve and assessment results of the health of patients treating complicated aortic infective endocarditis. This data was examined by the Kaplan-Meier survival curve and assessment result health of patients treating complicated aortic infective endocarditis into 108 cases patients, which it covered all patients in different hospitals in Iraq in the range from 17th June 2021 to 27th August 2022. This study was analyzed all patients for both males and females, where the first group presented the males (58), and the second group was females (50), where the characteristics of demographic data were analyzed by the SPSS program. **Results and Discussion:** The relevance of decreasing the postoperative pacemaker rate is due to proper sizing and insertion procedure rather than the structural architecture of the bioprosthesis. Other authors have also emphasized this point. In the current research, patients with IE have been shown to have a greater requirement for a permanent pacemaker, particularly in situations of perivalvular development of the IE. In our cohort, over 55% of patients had a perivalvular expansion of the IE and significant preoperative rhythm abnormalities, which required the postoperative installation of a pacemaker. **Conclusion:** This paper was noticed that all men got more impacted than females, while females have more complicated than males, where the most two parameters have more complications were got high injured which are cerebrovascular stroke, and fulminant sepsis, whereas the females were complicated more than males. As well as the outcomes noticed that the results found arrhythmia based on the Kaplan-Meier survival curve.

Keywords: Infective endocarditis (IE); arrhythmia; Perceval size; and Kaplan-Meier survival curve.

INTRODUCTION

Infective endocarditis (IE) is a disease that develops because of infection located in the endocardium valves (most common), the ventricles and atria, the lining of the great blood vessels of the chest [Meco, M. *et al*., 2018; D'Onofrio, A. *et al*., 2020], vascular connections, or foreign bodies within the heart. In IE, the aortic or mitral valve is frequently affected, and the tricuspid valve is less frequent. In about 10% of cases, there is involvement of >1 valve. IE precedes bacteraemia in a time ranging from less than two weeks (in 80% of cases) to 2-5 months (in some patients with IE on prosthetic valves). [Zubarevich, A. *et al*., 2021]

Uncommon signs and symptoms predominate high fever with chills or prolonged low-grade fever with hyperhidrosis (the most common manifestation, which may be absent in the elderly and in cases of heart and kidney failure), malaise, weakness, arthralgia, myalgia, Shortness of breath, weight loss, headache, and nausea. In addition, symptoms may be related to the effect 1) from the left side of the heart; [Diab, M. *et al*., 2020 - Jufar, A.H. *et al*., 2021] murmurs from affected regurgitation of the valve (about 80% of patients), in very rare cases, large vegetations can cause functional mitral stenosis; Symptoms of heart failure. Pulmonary edema in patients without prior heart disease. Symptoms related to obstruction (often in S. aureus IE): CNS (30-40)%; hemiparesis, aphasia, behavioural changes in micro-embolization; [Chalmers, J. *et al*., 2014 - Habib, G. *et al*., 2015] rarely intracranial haemorrhage due to rupture of an inflammatory aneurysm) of the renal arteries, splenic artery, or mesenteric arteries which can present with manifestations of paralytic ileus → abdominal or retrograde pain; Coronary artery occlusion (rare) → chest pain; [Habib, G. *et al*., 2019] from the central artery of the retina → disturbances in vision, from the peripheral artery → pain; Peripheral vascular symptoms (cutaneous and hypodermic petechiae, Osler's nodules [painful red lesions, located mainly on the fingers and

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toes], Roth's spots [Durack, D.T. *et al*., 1994] [retinal effusions with pale centres], Janeway's lesion [painless haemorrhagic spots on the palms of the hands and on the soles of the feet);2] From the right side of the heart: manifestations of pneumonia and pulmonary embolism, such as cough and chest pain with characteristics of pleurisy (septic pulmonary embolism). Rare haemoptysis and shortness of breath. Tricuspid or pulmonary valve regurgitation murmur does not appear or appears late [Li, J.S. *et al*., 2000; d'Udekem, Y. *et al*., 1996]. This paper aims to evaluate the Kaplan-Meier survival curve and assessment results of the health of patients treating complicated aortic infective endocarditis.

PATIENTS AND METHODS

This paper was shown as a cross-sectional study to evaluate the Kaplan-Meier survival curve and assessment results in the health of patients treating complicated aortic infective endocarditis. This data was examined by the Kaplan-Meier survival curve and assessment result health of patients treating complicated aortic infective endocarditis into 108 cases patients, which it covered all patients in different hospitals in Iraq in the range from 17th June 2021 to 27th August 2022. This study was analyzed all patients for both males and females, where the first group presented the males (58), and the second group was females (50), where the characteristics of demographic data were analyzed by the SPSS program.

The demographic of statistical analysis of aortic infective endocarditis patients based on age, sex, BMI within > 26 and < 26, and smoking where the information was presented in Table 1, Table 2, Table 3, and Table 4. To follow-up, this data also interested to examine of aortic infective endocarditis patients' symptoms which have changing murmur, chills, fatigue, Features of congestive heart failure, fever, Poor appetite, sweats, Systemic embolization, Valvular dehiscence, and Weight loss which these details were found in Table 5. Furthermore, this data progressed to examine the aortic infective endocarditis patients' comorbidities, where these parameters were including Chronic lung disease, Diabetes mellitus, Dyslipidemia, Hypertension, Liver disease, Peripheral arterial disease, and Renal insufficiency, which these outcomes can be seen in Table 6.

To further of results, this data was presented clinical data of NYHA class for aortic infective endocarditis patients between females and males which have I-II, III-IV, History of stroke, Prior cardiac surgery, Coronary artery disease, Preoperative dialysis, Preoperative inotropic support, and Cardiogenic shock which these outcomes were clearly in Figure 1. Besides that, this paper was determined of microbiological characteristics for aortic infective endocarditis patients that progress into agalactiae, Gordonii, Mutans, Not-found, Pyogenes, Streptococcus, and Viridans in comparison between males and females where these results are found in Table 7.

In addition, this data was analyzed characteristics of staphylococcus and enterococcus outcomes for aortic infective endocarditis patients between females and males, where these details can be got in Figure 2 and Figure 3. Moreover, this paper was conducted with intraoperative characteristics, which include aortic regurgitation for aortic infective endocarditis patients in comparison with <2 and >2, which these results were got in Table 8. This study was estimated of an intraoperative peak of aortic regurgitation for aortic infective endocarditis patients into two parameters which are Cardiopulmonary by-pass time, minutes, and Aortic cross-clamp time, mm and Clinical outcomes of intraoperative aortic infective endocarditis patients and these outcomes were found into evaluations of echocardiographic data between males and females where these outcomes have found Figure 4, Figure 5, and Figure 6. Finally, this paper was determined into postoperative complications, which include fulminant sepsis, renal failure requiring dialysis, advanced heart failure, and cerebrovascular stroke, where the outcomes can be found in Table 9. This paper was determined the patients based on Perceval size, which are S, M, L, and XL, which it is presented in Figure 7, as well as the assessment of aortic infective endocarditis patients between females and males, where it assessed results of the health of patients in Kaplan-Meier survival curve, which this result can be seen in Figure 8.

RESULTS

Table 1: Statistical analysis of aortic infective endocarditis patients based on age

N	**Va**	108
	Mi	0
M		61.0556

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STME	1.05809
Me	62.0000
Mo	70.00
SD	10.99603
Var	120.913
Sk	-.189
SE	.233
Ra	40.00
Min	40.00
Max	80.00
S	6594.00

Table 2: Distributions of aortic infective endocarditis patients based on sex

		Freq	**Per (%)**	**VP (%)**	**CP (%)**
Val	Female	50	46.3	46.3	46.3
	Male	58	53.7	53.7	100.0
	To	108	100.0	100.0	

Table 3: Distributions of aortic infective endocarditis patients based on BMI

		Freq	**Per (%)**	**VP (%)**	**CP (%)**
V	<26	24	22.2	22.2	22.2
	>26	84	77.8	77.8	100.0
	T	108	100.0	100.0	

Table 4: Distributions of aortic infective endocarditis patients based on smoking

		Freq	**Per (%)**	**VP (%)**	**CP (%)**
V	No-smoker	63	58.3	58.3	58.3
	Smoker	45	41.7	41.7	100.0
	T	108	100.0	100.0	

Table 5: Examination of aortic infective endocarditis patients' symptoms

		Freq	**Per (%)**	**VP (%)**	**CP (%)**
V	changing murmur	3	2.8	2.8	2.8
	chills	16	14.8	14.8	17.6
	fatigue	7	6.5	6.5	24.1
	Features of congestive heart failure	12	11.1	11.1	35.2
	fever	17	15.7	15.7	50.9
	Poor appetite	15	13.9	13.9	64.8
	sweats	9	8.3	8.3	73.1
	Systemic embolization	9	8.3	8.3	81.5
	Valvular dehiscence	4	3.7	3.7	85.2
	Weight loss	16	14.8	14.8	100.0
	T	108	100.0	100.0	

Table 6: Examination of aortic infective endocarditis patients' comorbidities

		Freq	**Per (%)**	**VP (%)**	**CP (%)**
V	Chronic lung disease	12	11.1	11.1	11.1
	Diabetes mellitus	29	26.9	26.9	38.0
	Dyslipidaemia	9	8.3	8.3	46.3
	Hypertension	28	25.9	25.9	72.2
	Liver disease	12	11.1	11.1	83.3
	Peripheral arterial disease	11	10.2	10.2	93.5
	Renal insufficiency	7	6.5	6.5	100.0
	T	108	100.0	100.0	

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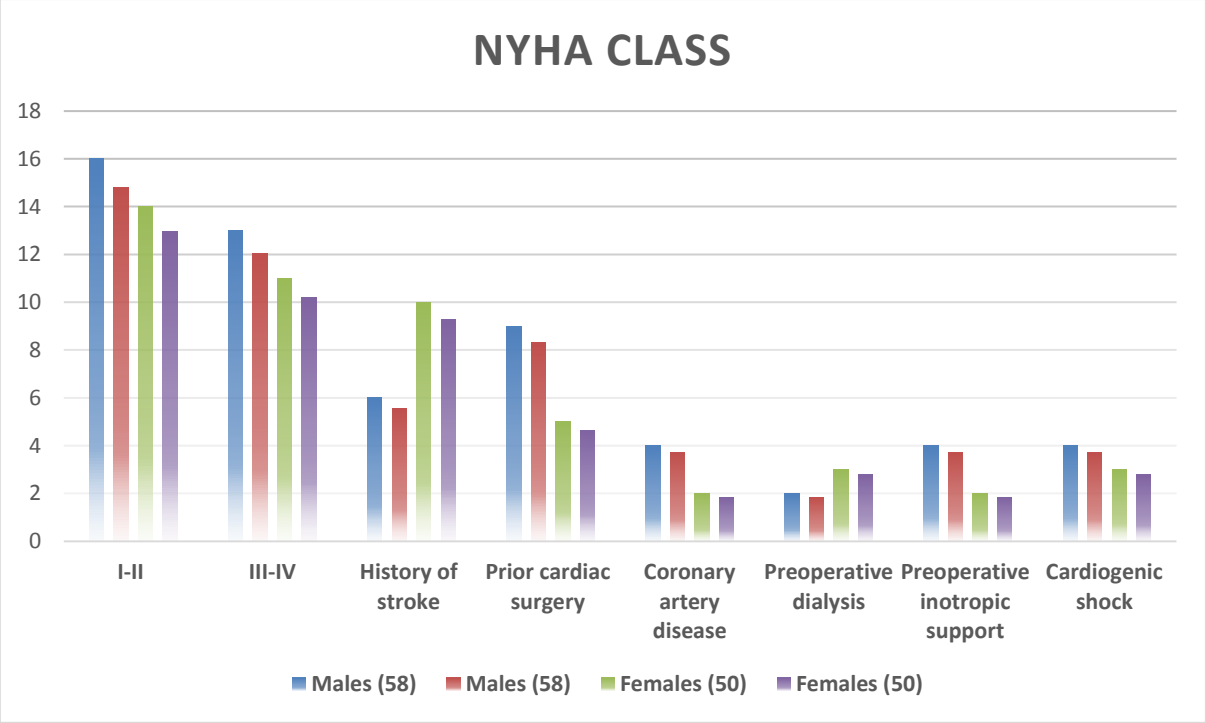

Figure 1: Clinical data of NYHA class for aortic infective endocarditis patients between females and males

Table 7: Determination of Microbiological characteristics for aortic infective endocarditis patients

		Freq	Per (%)	VP (%)	CP (%)
V	Agalactiae	4	3.7	3.7	3.7
	Gordonii	4	3.7	3.7	7.4
	Mutans	5	4.6	4.6	12.0
	Not-found	76	70.4	70.4	82.4
	Pyogenes	12	11.1	11.1	93.5
	Streptococcus	4	3.7	3.7	97.2
	Viridans	3	2.8	2.8	100.0
	T	108	100.0	100.0	

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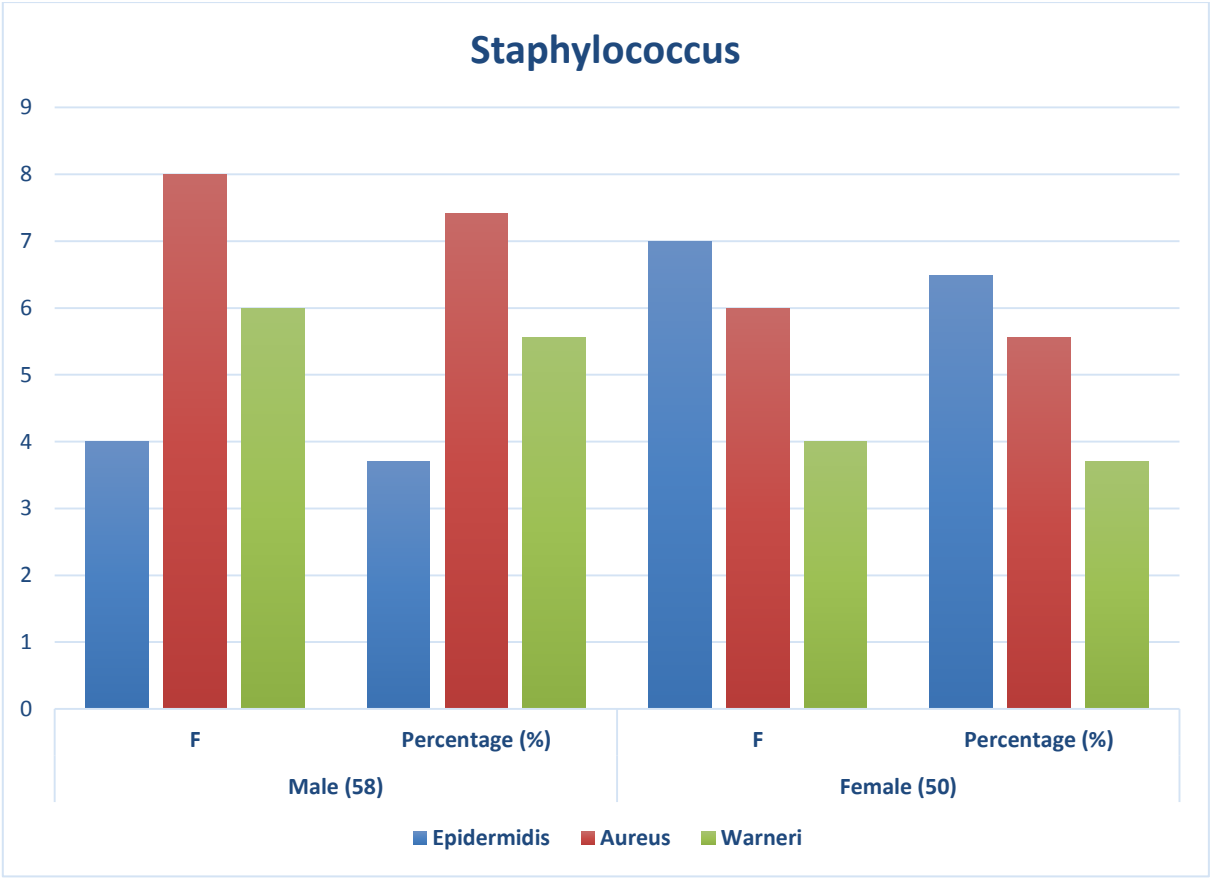

Figure 2: Characteristics of Staphylococcus outcomes for aortic infective endocarditis patients between females and males

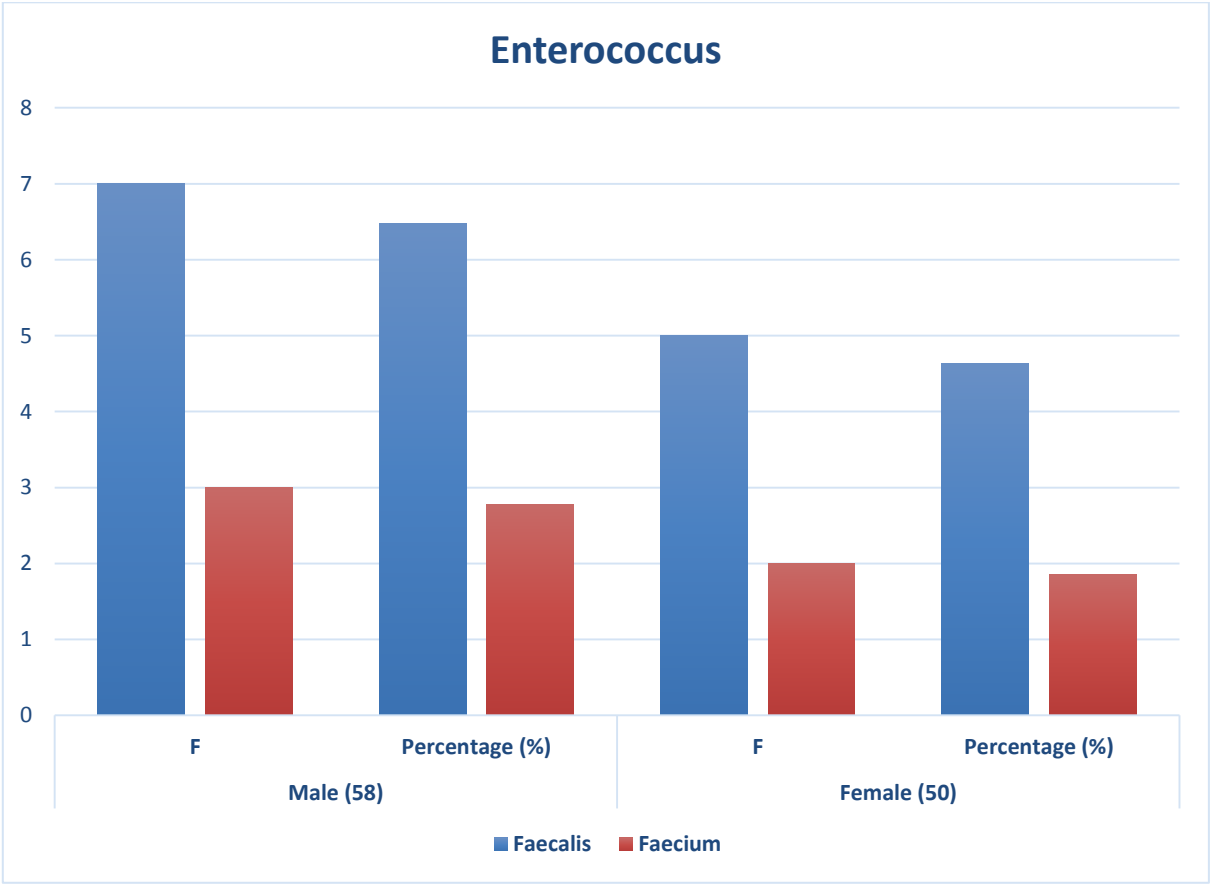

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Figure 3: Characteristics of Enterococcus outcomes for aortic infective endocarditis patients between females and males

Table 8: Conducting of intraoperative characteristics, which include aortic regurgitation for aortic infective endocarditis patients

		Freq	Per (%)	VP (%)	CP (%)
V	<2	23	21.3	21.3	21.3
	>2	43	39.8	39.8	61.1
	No	42	38.9	38.9	100.0
	T	108	100.0	100.0	

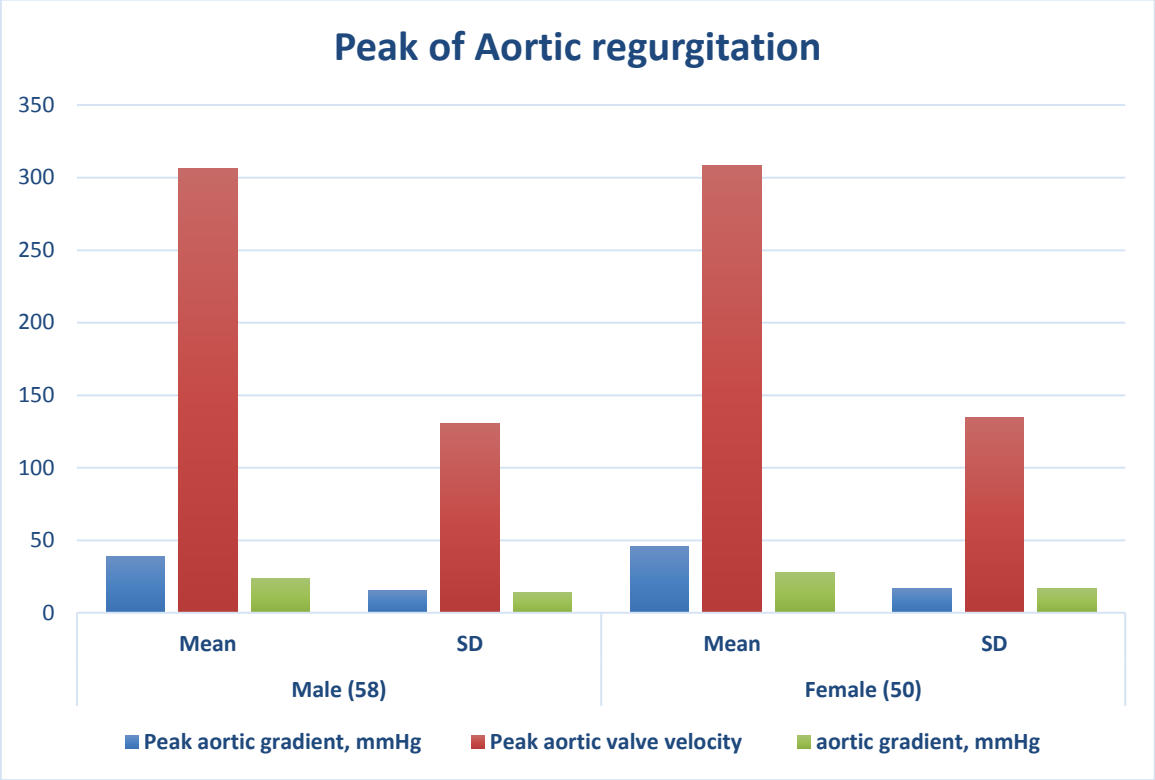

Figure 4: Estimations of the intraoperative peak of aortic regurgitation for aortic infective endocarditis patients

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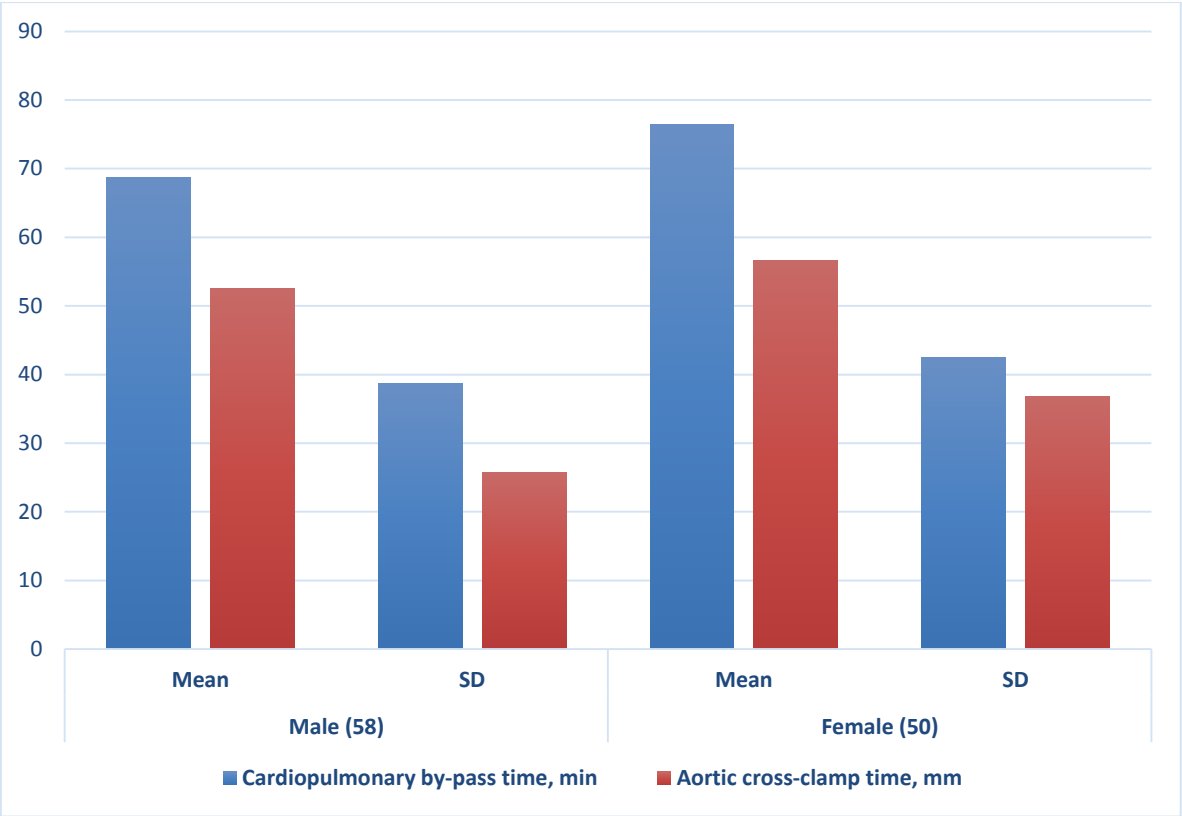
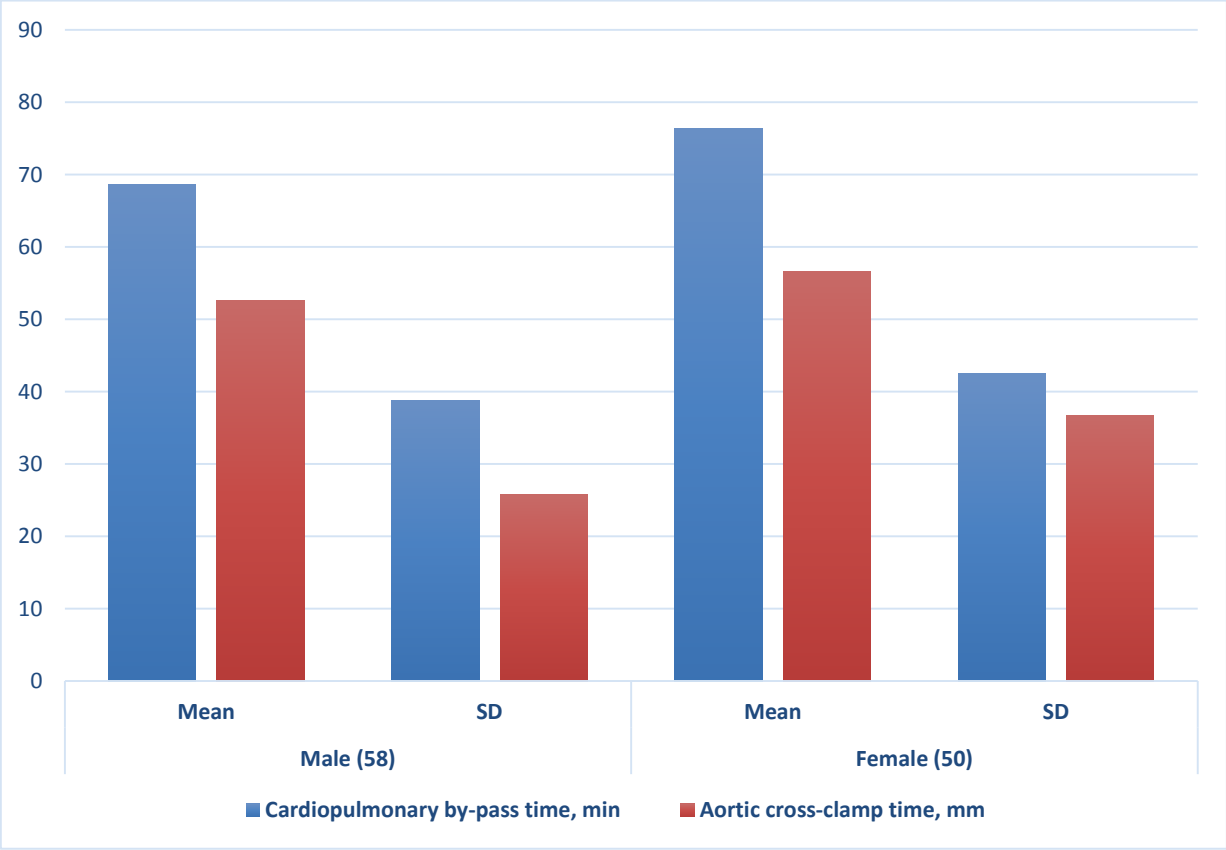


Figure 5: Clinical outcomes of intraoperative aortic infective endocarditis patients



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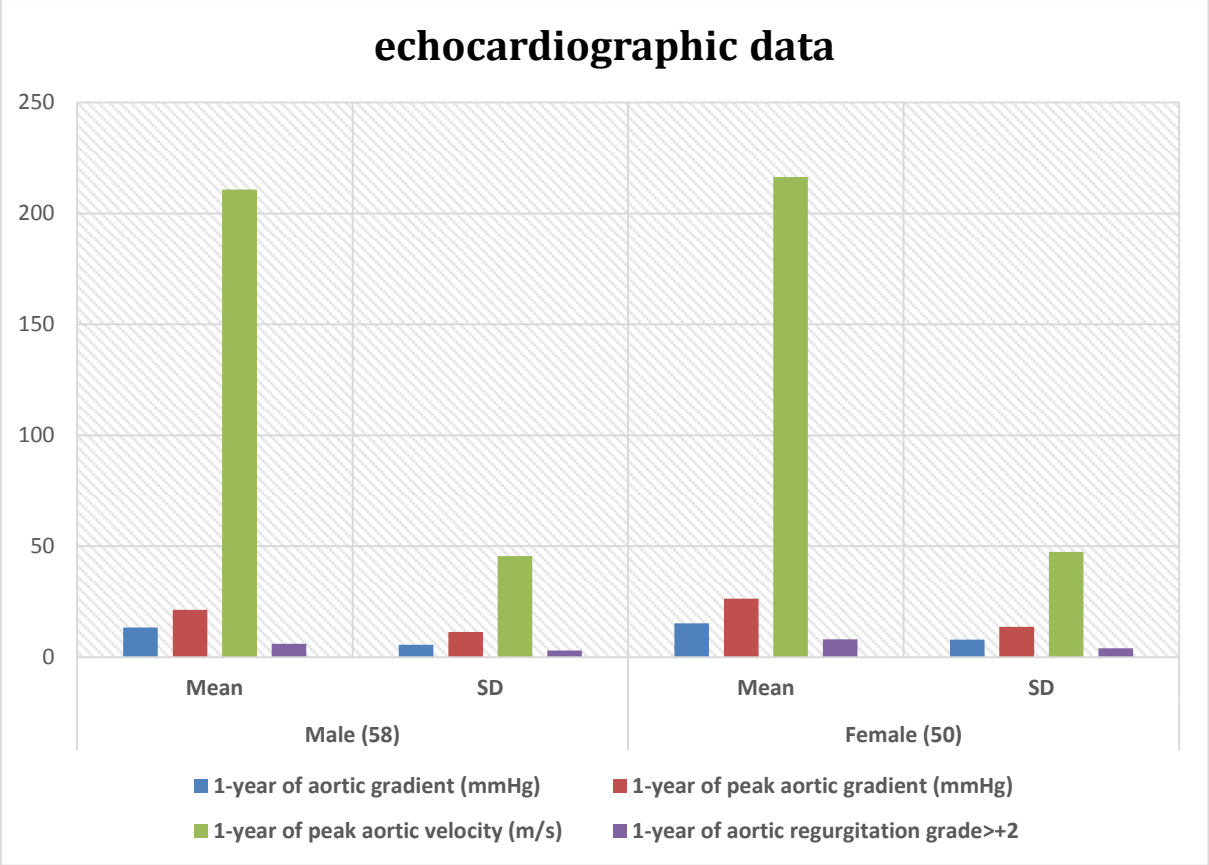

Figure 6: Evaluations of echocardiographic data between males and females.

Table 9: Postoperative complications

Complications							
Count							
		VAR00012					Total
		advanced heart failure	cerebrovascular stroke	fulminant sepsis	Not-found	renal failure requiring dialysis	
	Female	4	8	8	25	5	50
	Male	2	3	5	43	5	58
Total		6	11	13	68	10	108

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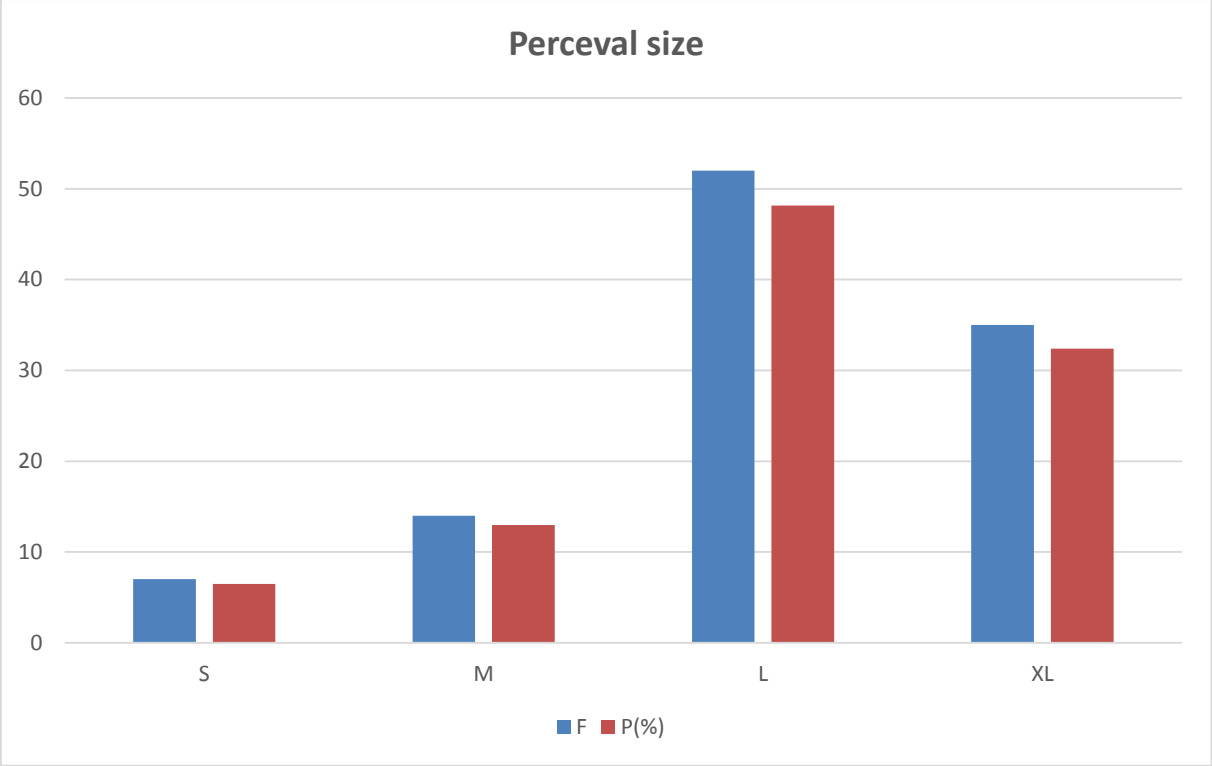

Figure 7: Distribution of patients based on Perceval size

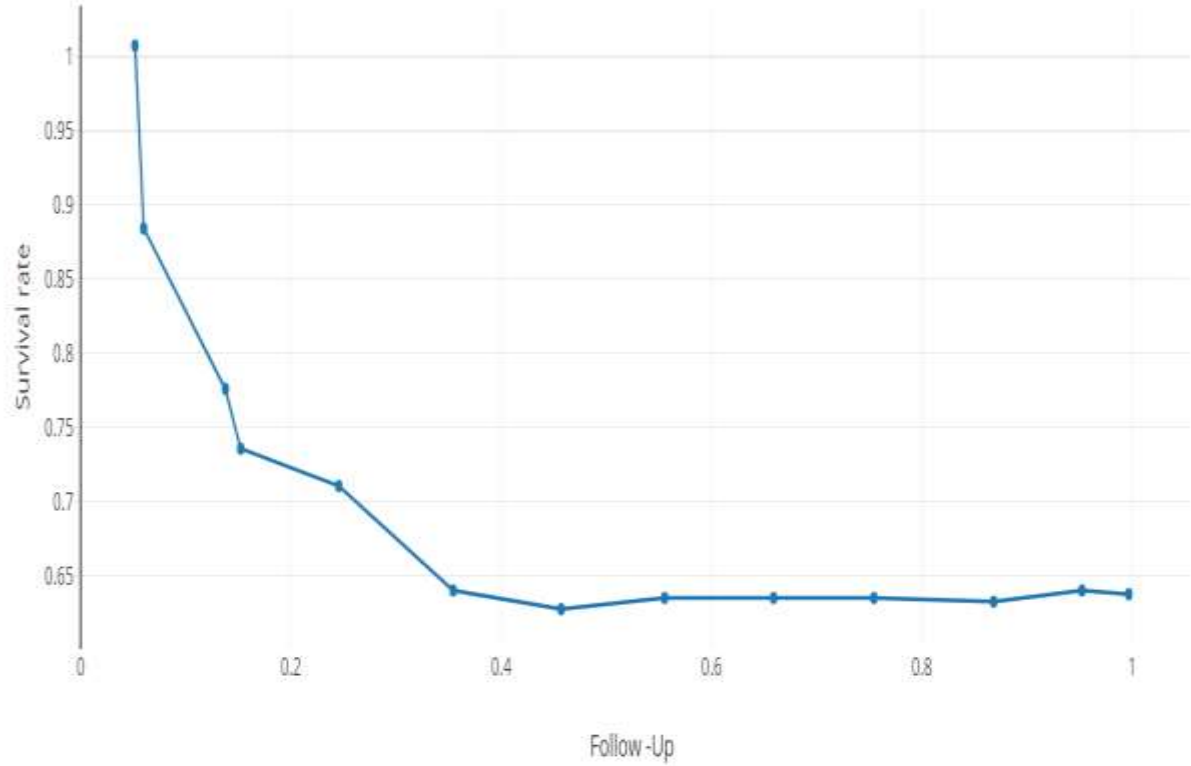

Figure 8: Assessment result health of patients in Kaplan-Meier survival curve

DISCUSSION

This paper was interested to analyses the result health of patients treating complicated aortic infective endocarditis, where it noticed the data the females were more got impacted more than males. Active IE is a systemic disorder that affects more than only the heart valves. Furthermore, half of the cases were reoperations, and more than 35% of the

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patients required surgery in addition to the SU-AVR. Even under this dreadful environment, our observed 30-day mortality was 10.2%, and our 1-year survival rate was more than 72%. Zubarevich, et al., [Yankah, A.C. *et al*., 2005] has presented a series of 13 patients who had SU-AVR for a complex aortic IE. The presence with IE following cardiac valve surgery corresponds with a heightened inflammatory response, as seen by greater plasma cytokine levels along with additional inflammatory mediators, and is even associated with an increase in in-hospital mortality.

Similarly, in the previously referenced work by Zubarevich et al., the researchers reported mean CPB and AXC times of 89.833.6 minutes and 59.127.8 minutes, respectively, for a series of 13 patients. Not only are many IE patients too unwell to tolerate long morbid surgeries, but they would also benefit the most from hemodynamically good postoperatively valvular function and a low risk of PVL. Another advantage associated with the Perceval futureless valve implantation procedure for the treatment of complex IE is that it avoids unnecessary aortic annular manipulation.

The absence of sutures with its expandable super-elastic stent allows for the anchoring for reconstruction patches and the elimination of unnecessary tractions on them, lowering the rate of PVL. Similarly, the Perceval valve features both an intra-annular and supra-annular sealing collar. This design helps to reduce PVL in IE, particularly if there is significant annular damage and tissue friability. Despite the fact that more than 60% of the patients in our research had an aortic root issue, there were no incidences of severe PVL throughout the follow-up. [Knosalla, C. *et al*., 2000]

The relevance of decreasing the postoperative pacemaker rate is due to proper sizing and insertion procedure rather than the structural architecture of the bioprosthesis. Other authors have also emphasized this point. In the current research, patients with IE have been shown to have a greater requirement for a permanent pacemaker, particularly in situations of perivalvular development of the IE. In our cohort, over 55% of patients had a perivalvular expansion of the IE and significant preoperative rhythm abnormalities, which required the postoperative installation of a pacemaker. [Wang, A. *et al*., 2018]

As a result, the 9.4% of postoperative pacemaker insertion may be explained better by preoperative rhythm abnormalities discovered as IE complications than by the Perceval valve implantation procedure. Limitations This research demonstrates the limits of any observational study. The key restriction is that the total number of patients recruited in this trial may be small, resulting in a lack of statistical ability to detect some clinically important outcomes. Furthermore, IE is a continuous range that includes anything from mild aortic valve dysfunction to substantial aortic root damage, as well as possible multivalvular involvement.

CONCLUSION

This paper was noticed that all men got more impacted than females, while females have more complicated than males, where the most two parameters have more complications were got high injured which are cerebrovascular stroke, and fulminant sepsis, where the females were complicated more than males. As well as the outcomes noticed that the results found arrhythmia based on the Kaplan-Meier survival curve.

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