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Original Research Article

Evaluation of the results of heart valve surgery in hospitalized drug addicts with infective endocarditis

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ABSTRACT

Introduction: Despite the importance that was assessed in this section, we found in our review that so far no study has evaluated the effectiveness of this type of surgery as well as the recurrence of endocarditis after surgery. Therefore, the aim of this study was to evaluate the effectiveness of heart valve surgery in injecting drug users with infectious endocarditis referred to Tabriz University Center (Shahid Madani Hospital) retrospectively and prospectively, in which patients in the period 2015 to 2020 as a group. Studies have been evaluated and reviewed. **Material and Methods:** This retrospective study was performed in the period from 2015 to 2020 with the participation of patients addicted to narcotics and endocarditis after heart surgery in Shahid Madani Hospital in Tabriz. The results of these patients were reported in this study. **Results:** 5 patients (26.3%) had recurrence of endocarditis after surgery and the overall mortality of patients was equal to 9 patients (47.4%). Of these patients, 4 patients (21.1%) died at the time of hospitalization, 8 patients (42.2%) died less than one year after surgery and 1 patient (2.5%) died one year after surgery. The lack of mortality in this plan was equal to 10 cases (52.6%). **Conclusion:** Considering the mortality and high probability of recurrence in injecting drug users with endocarditis, it can be concluded that surgery in this group of patients is associated with high risk and should be more careful in selecting patients requiring surgical treatment.

Keywords: heart valve surgery, endocarditis, drug addicts

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Introduction

Significant lesions in the urethra include a platelet, urea, oocytes, and O cells. In developed countries, the incidence of endocarditis is about 7 cases per 100,000 people per year and has remained constant from 1950 to 2000. The incidence of endocarditis among the elderly has increased significantly. Accordingly, and as stated, the presence of bacteria in the blood does not always lead to endocarditis, and also not all bacteria are able to cause endocarditis, and therefore identify the causes of endocarditis and the conditions that predispose the patient to this disease. It is very important[1]. The entry of bacteria or other microorganisms alone is not enough to cause endocarditis, and the human body needs to respond to these conditions to cause inflammation in the heart system, the body responds by sending immune cells and fibrin to trap the organism[2]. A group of cellular materials that have a set of organisms is called vegetation. Vegetations may interfere with one of the valve functions. Vegetations may also rupture and block one of the blood vessels in a vital organ, thus blocking the arteries as an embolus. Injecting drug users who use common or contaminated needles are also at higher risk for endocarditis. Accordingly, this group of patients is also very important in evaluating and evaluating the clinical condition[3]. Fever is in the 80s and 90s. Most people report other flu-like symptoms such as muscle aches, fatigue, night sweats, and loss of appetite. Symptoms of heart failure, such as shortness of breath and confusion, are sometimes the first signs of infectious endocarditis. There may also be changes in the skin and nails, such as red spots on the palms of the hands and feet, painful sores on the tips of the fingers and toes, or dark lines (fine bleeding) under the nails that look like wood chips. Infectious endocarditis may cause other complications such as anemia and hematuria. Studies have shown that in most injecting drug users [4], endocarditis is caused by *Staphylococcus aureus* (right endocarditis), which is more likely to involve the tricuspid valve. Injecting drug users are on the rise due to the increasing prevalence of new industrial narcotics. About 24 to 40% of hospital admissions are related to the side effects of drug use. Due to social poverty and lack of hygiene in injecting drug users and the use of contaminated syringes, the risk of infectious complications and transmission of infections is very high. Due to the high incidence of infectious complications such as skin ulcers and endocarditis, the hospitalization rate of these patients is high [5]. Accordingly, high costs of surgeries (such as valves, oxidizers, surgical team costs, and antibiotics) are incurred for these patients, and also due to frequent

hospitalizations and surgeries, the risk of medical personnel increasing to various infections increases; However, due to re-use of injectable substances, the risk of endocarditis recurrence and re-operation is high (30%). In addition, the mortality rate of addicts is generally higher in injecting individuals than other addicts. Also, maintenance and care after surgery puts a lot of money on the health care system for the hospital and its welfare. One of the main treatments available for injecting drug users with endocarditis is valve surgery. Based on the cases stated in this section, the importance of this category of assessments on patients with endocarditis, especially patients with addiction [6]. Despite the importance that was assessed in this section, we found in our review that so far no study has evaluated the effectiveness of this type of surgery as well as the recurrence of endocarditis after surgery[7]. Therefore, the aim of this study was to evaluate the effectiveness of heart valve surgery in injecting drug users with infectious endocarditis referred to Tabriz University Center (Shahid Madani Hospital) retrospectively and prospectively, in which patients in the period 2015 to 2020 as a group. Studies have been evaluated and reviewed.

Material and Methods

Study design: This evaluation is a retrospective and prospective cohort evaluation. Therefore, the evaluation period of this study is from the beginning of 2015 to 2020 and patients with endocarditis are evaluated in this time period. اند. The location of this evaluation is the Cardiac Surgery Center of Tabriz University of Medical Sciences (Shahid Madani). In order to perform this evaluation, 19 patients were considered as a study group. The method of determining the sample size in this evaluation was census. Based on this, the census of all injecting drug addicts with infective endocarditis who have undergone heart valve surgery in Tabriz University Center has been retrospectively and futurely concerned. By referring to the database of Shahid Madani Hospital, among the cases of heart valve surgery About 21 injecting drug patients with endocarditis were found, two of whom were not eligible for inclusion in the study due to lack of information about their exact condition or failure to answer the phone call, and were therefore excluded.

Inclusion and exclusion criteria: Heart surgery, endocarditis and drug addiction were the inclusion criteria in this study and mortality following surgery, addiction to several drugs and alcohol consumption were also exclusion criteria in this study.

Methodology: The subjects of this study included injecting drug addicts with endocarditis who underwent heart valve surgery at Shahid Madani Hospital in Tabriz from 2015 to 2020, and based on this information about them in the form of a checklist. Relevant, taken from the files in the hospital archives and from the patients themselves or their companions during a telephone call. In this evaluation, only one checklist evaluating the patients' condition was used and based on this, no other tools were used. The checklist evaluating the patients including age, gender, having or not having comorbidities, type Surgery (including aortic valve replacement, tricuspid, mitral, pulmonary), duration of surgery (hours), positive or negative blood culture, emergency or elective surgery, need for reoperation for any reason (including mediastinitis, drainage, Tamponade, functional disorders), duration of hospitalization (days), costs of surgery and hospitalization (USD), occurrence or non-occurrence of myocardial infarction after surgery, recurrence of the disease, and condition of death (No death, mortality at hospitalization, mortality less than one year after surgery, and mortality after one year of surgery). Based on this, the information obtained from this assessment evaluates the prognostic status of patients.

Data analysis: Data were described with the help of descriptive statistics indices in the form of frequency and mean±standard deviation in the form of appropriate tables and graphs. Chi-square test was used to examine the relationship between classified data and T-test and Mann-Whitney-U test were used for continuous data. Also, the normality of the data was checked by Kolmogorov-Smirnov test and in case of normal distribution of data, T test was used and for abnormal distribution, Mann-Whitney-U test was used. At the end and after statistical evaluations, P value less than 0.05 was considered statistically significant. Statistical analysis was performed using SPSS software.

Ethical considerations: This study was conducted after approval by the ethics committee of Tabriz University of Medical Sciences (NO: IR.TBZMED.REC.1400.675). Then the informed consent was completed by the participants and their information was used.

Results

In this evaluation, 19 injecting drug addicts with infective endocarditis were evaluated and evaluated. Demographic information evaluated in these patients included age and gender, which was evaluated in this group of patients., the mean and standard deviation of the age of patients evaluated in this study is 46.58 ± 12.85 years; In these patients, the minimum age was 26 years and the maximum age was 72 years. Also, in this table about the sex of patients can be seen that 17 cases (89.5%) of patients were male and the others, ie only 2 patients (10.5%) were female. Accordingly, the dominance of the male gender in this assessment is significant. In this study, comorbidities in the patients under study, especially the history of comorbid heart disease, have been evaluated as an effective factor in the prognosis of patients. 8 cases (42.2%) of the patients under study had disease and 11 cases (57.8%) remained without disease. Among patients with underlying disease, four had hepatitis C, one had hepatitis B, two had ESRD on dialysis, and one had diabetes. None of the patients or their companions mentioned a history of heart disease, one of the reasons for which could be the lack of diagnosis of heart disease in these patients due to poor social and economic status. As one of the risk factors for postoperative mortality, emergency or elective heart valve surgery in the studied patients, it was evaluated that 16 cases (84.2%) were emergency and only 3 cases (15.8%) They were elective. In the study of blood culture of patients under study, 6 cases (31.5%) were positive and 13 cases (68.5%) were negative and the most common microorganism in blood culture of patients was *Staphylococcus aureus* so that in 5 patients 6 patients who had positive blood culture were reported to have *Staphylococcus aureus* (83.3%) which was associated with *Staphylococcus epidermidis* in 3 patients. One of the variables studied in this study was the type of surgery in injecting drug addicts with endocarditis. As a result, information about which of the heart valves in each patient underwent surgery was evaluated. In 8 cases (42.1%) of the patients studied, tricuspid valve surgery was performed. 7 cases (36.8%) of the patients underwent aortic valve surgery. In 2 cases (10.5%) of patients, the mitral valve was operated and repaired. In 2 cases (10.5%) the remaining two valves were operated simultaneously. (In one patient the aortic and mitral valves and in the other patient, the aortic and tricuspid valves were operated on simultaneously). Another surgical-related variable that has been studied in this study is the duration of each surgery, which has been evaluated in terms of hours in all patients. The average duration of heart

valve surgery in injecting drug addicts with endocarditis under study is about 4.5 hours, with the shortest duration of surgery being about 2.5 hours and the longest duration being about 8.3 hours. These findings are reminiscent of the length of any surgery on this group of patients. Of the evaluated patients, 5 patients (26.3%) had recurrence of endocarditis after surgery and the overall mortality of patients was equal to 9 patients (47.4%). Of these patients, 4 patients (21.1%) died at the time of hospitalization, 8 patients (42.2%) died less than one year after surgery and 1 patient (2.5%) died one year after surgery. The lack of mortality in this plan was equal to 10 cases (52.6%). In the study of the effect of patients' age on mortality after surgery, we divided patients into two groups less than equal to 40 years and more than 40 years. 5 (55.5%) of the patients died in the age group less than equal to 40 years and the other 4 (45.5%) in the age group were more than 40 years. The rate can be due to the increased use of injecting drugs in younger people. On the other hand, 62% of people younger than the age of 40 died in this study; This is despite the fact that 36% of people over the age of 40 died during the study. Finally, in this study, the p value of the effect of age on patient mortality was 0.37 and non-significant.

Discussion

The main purpose of this study was to evaluate the results of heart valve surgery in injecting drug users with endocarditis, which is a major factor in the recurrence of the disease and mortality after surgery. In our evaluation, we observed that the overall patient mortality rate during the study was equal to 9 patients (47.4%). Of these patients, 4 patients (21.1%) died at the time of hospitalization, 8 patients (42.2%) died in less than a year and 1 patient (5.3%) died after one year of surgery. The results obtained in this study showed that the average total survival of patients studied in this study was 30.5 months. Out of 19 patients in our study, 4 patients (21.1%) had recurrences. Among the variables studied in this study, the duration of surgery had a significant relationship with the mortality rate of patients, so that with increasing the duration of surgery, the mortality rate in patients has increased [8, 14-16]. In our evaluation, we evaluated the prognosis of patients and observed that about half of the patients did not have a proper prognosis and died, so the overall mortality of patients in our evaluation was 47.4%. On the other hand, regarding the recurrence rate of endocarditis after surgery, we have observed that 21.1% of patients have recurrence of endocarditis after surgery. The results observed in other studies are discussed below [9, 17-19]. In a study conducted by patients on endocarditis and their surgical

results since 2020, Kazemzadeh et al., After evaluating 24 patients who underwent surgery, found that 7 people 29% of patients died after surgery, which is different from the mortality rate in our study. Also, the highest mortality rate in this group of patients was more than 40 years old, so that they stated that 50% of patients died at this age, which also does not correspond to the result observed in our evaluation. In our study, 55% of patients who died were less than 40 years of age. Regarding the recurrence of the disease in a study, 16.6% of patients had recurrence after surgery, which is lower than the recurrence rate in our study [10, 20-22]. This difference in results may be due to differences in studies because in our study the target group was selected from injecting drug users with endocarditis, but in this study, the study was performed on all patients with endocarditis and can show Gives more mortality and recurrence in injecting drug users with endocarditis as well as mortality at younger ages in this group [11, 23-25]. Another researcher in his study on injecting drug addicts with endocarditis stated that the mortality rate due to infective endocarditis in this group of patients was 55%, which was consistent with the results observed in our evaluation. Accordingly, the high mortality rate in this group of patients shows the importance of paying attention to these patients. In this study, a reference was made to the percentage of patients who underwent surgery to treat endocarditis and the specific mortality rate Has not been. They also stated that the recurrence rate of endocarditis after medical treatment in injecting drug users was 5%, which required further interventions based on the patients' condition. These results did not match the results observed in our evaluation. Other researchers in their assessment of cardiac patients with normal valvular endocarditis during the years 1995 to 1999 have stated that the mortality rate of patients is generally equal to 20% and in patients who underwent surgery equal to It has been with 18% [12, 26-28]. Accordingly, the results of our study were different from the results of their evaluation, and this difference is due to differences between the groups evaluated in the two studies, in that they evaluated heart patients with endocarditis. But we have evaluated patients with endocarditis in the field of injecting drug addiction who have undergone surgery. Researchers in their assessment from 2012 to 2020 on patients with endocarditis who underwent tricuspid valve surgery stated that the overall mortality rate of patients was 13.5%, based on the results observed in Their evaluation and the amount of mortality observed was lower than our evaluation. In our study, 50% of the patients who underwent tricuspid valve surgery died, and this difference is due to differences in the groups evaluated in the two studies, so that we in the evaluation of patients themselves We

have evaluated injecting drug use, which may have a worse prognosis than other patients with endocarditis of different etiologies, which has increased their mortality by up to 50% [13, 29-31].

Conclusion

Considering the mortality and high probability of recurrence in injecting drug users with endocarditis, it can be concluded that surgery in this group of patients is associated with high risk and should be more careful in selecting patients requiring surgical treatment. Each patient should decide on how to deal with the surgery, taking into account the benefits and harms of the surgery; Attention to the risk factors of patients such as comorbidities, especially renal failure, factors that can lead to prolongation of the duration of surgery, such as old age or involvement of several valves at the same time or concomitant heart disease, attention to the duration Prolonged hospitalization and high surgical costs of these patients and the possibility of transmitting bloodstream infections to medical personnel during surgical procedures. It should also be borne in mind that the reuse of injecting drugs, as well as the lack of proper support for these patients by the family and the inability to financially follow the heart condition after heart surgery and take the necessary drugs, can cause multiple complications and increase the risk of recurrence and mortality. These patients are cured. On the other hand, the indications for surgical treatment in these patients should be considered because the lack of surgical treatment or its delay if the patient needs it can also increase mortality and morbidity in these patients.

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