

FREQUENCY OF ATRIAL FIBRILLATION IN POST OPERATIVE CORONARY ARTERY BYPASS GRAFTING SURGERY

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All the authors contributed significantly to the research that resulted in the submitted manuscript.

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ABSTRACT

Objective: To determine frequency of atrial fibrillation (AF) in post operative coronary artery bypass grafting (CABG) surgery.

Methodology: This descriptive case series study was performed at Ch. Pervaiz Elahi Institute of Cardiology Multan. After approval from local ethical committee, 289 patients fulfilling the inclusion criteria selected from the patients who have undergone CABG surgery and were in intensive care unit of Chaudhary Pervaiz Elahi Institute of cardiology were included. They were observed during hospital stay for development of AF. Data was analyzed using SPSS Version 10. Descriptive statistics was used to calculate mean and standard deviation for age. Frequencies and percentages were calculated for final out come i.e atrial fibrillation. Effects modifiers like age and gender controlled by stratification and p-value of 0.05 was taken as statistically significant.

Results: In this study there were 289 patients who underwent CABG. The average age of patients was 52.27 ± 9.078 years. Males were 200 (69%) and 89 (31%) were female patients. 114 (39.44%) were within 51-60 years of age. During follow up atrial fibrillation was reported in 44 (15.2%) cases in which 42 were male and 02 were female patients. Frequency of atrial fibrillation was found 24 (54.54%) in patients of age group 61-65 years.

Conclusion: The frequency of AF following CABG was higher in male patients and it increases with age.

Key Words: Atrial Fibrillation, CABG

INTRODUCTION

Atrial fibrillation (AF) after coronary artery bypass surgery (CABG) is the most common sustained arrhythmia. Its pathophysiology is unclear, and its prevention and management remains sub optimal. New-onset postoperative coronary artery bypass grafting atrial fibrillation is significantly associated with increased long-term risk of mortality independent of patient preoperative severity.¹ Postoperative atrial fibrillation has been reported in 25-60% of patients depending on the type of cardiac surgery performed in international literature.² In one local study, frequency of atrial fibrillation was 6% post cardiac surgery.³ Elevated norepinephrine levels suggest that sympathetic activation may be important in the pathogenesis of atrial fibrillation after CABG, and this underlines the importance of β -adrenoceptor blockade as prophylaxis.⁴

Increasing age, male gender, hypertension, need for an intra operative intra-aortic balloon pump, postoperative pneumonia, ventilation for >24 hours, and return to the intensive care unit, are independent predictors of postoperative atrial fibrillation resulting in potentially higher risk of adverse outcomes. African Americans have a significantly reduced incidence of atrial fibrillation compared to European Americans after coronary artery bypass grafting.⁵ The incidence of postoperative atrial fibrillation is influenced by the technique of CABG with or without cardiopulmonary bypass. The prevalence of postoperative atrial fibrillation increase when CABG is combined with valve replacement.⁶

We conducted this study to know exact frequency of atrial fibrillation in post CABG patients in our local population.

METHODOLOGY

It is a descriptive case series study was performed at Ch. Pervaiz Elahi Institute of Cardiology Multan. The duration of study was 6 months. The sample was collected by non-probability purposive technique. All patients undergoing CABG either male or female of 30-65 years included in the study. Patients with history of; atrial fibrillation, valvular heart disease, chronic obstructive pulmonary disease, thyrotoxicosis, chronic alcoholism and severe left ventricular dysfunction i.e ejection fraction < 25% were excluded from the study.

Patients fulfilling the inclusion criteria were 289 selected from the patients who have undergone CABG surgery and are in intensive care unit of Chaudhary Pervaiz Elahi Institute of cardiology. Demographic information like name, age and gender taken. Atrial fibrillation assessed by observing hourly pulse chart, observing daily ECG of the patients for seven consecutive postoperative days while patient is admitted in ICU and by monitoring cardiac rhythm on cardiac monitors attached to the patients and final outcome measured at 7th

postoperative day. Data was analyzed using SPSS Version 10. Descriptive statistics used to calculate mean and standard deviation for age. Frequencies and percentages calculated for final out come i.e atrial fibrillation (yes, no). Effects modifiers like age and gender controlled by stratification and p-value of 0.05 taken as significant.

RESULTS

In this study there were 289 patients who underwent CABG. The average age of patients was 52.27 ± 9.078 years. There were 200 (69%) males and 89 (31%) were females. Frequency of atrial fibrillation was in 44 (15.2%) during follow up. Out of this 44 patients with AF, 42 (21.0%) were male and 2 (2.24%) were females. When stratification was done on age it was found that atrial fibrillation was present in 24 (54.54%) patients of age group 61-65 years, 16 (36.36%) patients in age group of 51-60 years, 4 (9.09%) patients in age group of 41-50 years while 0(0.00%) patients in age group of 30-40 years as shown in Table 1, while percentage of patients with atrial fibrillation according to age groups as shown in Table 2.

DISCUSSION

Postoperative atrial fibrillation (AF) is one of the most frequent complications of cardiac surgery. The mechanism of this arrhythmia is likely the reentry that may result from either a preexisting or developing electro-physiologic substrate after surgery. Postoperative AF is usually well-tolerated, but it may result in hemodynamic instability and subjective discomfort. Importantly, compared with patients remaining in sinus rhythm, patients developing postoperative AF are more likely to have other operative morbidity, including stroke, prolonged hospitalization, and increased hospital cost. In the setting of early hospital discharge after cardiac surgery, AF is the most common cause for hospital readmission.⁷ The identification of patients who are at higher risk for AF might allow for preventive strategies to be focused on the patients who are most likely to benefit from such therapy. Postoperative AF is more common in elderly patients and often develops in those patients who have co-morbidities that also predispose them to other complications and prolonged hospitalization. The prevention of postoperative AF should result in improved

Table 1: Stratification of Age Groups According to Atrial Fibrillation

Age Groups(years)	Frequency	Percentages
30-40	0	0.00%
41-50	4	9.09%
51-60	16	36.36%
60-65	24	54.54%

Table 2: Percentage of Patients with Atrial Fibrillation According to Age Group

Age Groups (years)	No. of patients	Atrial Fibrillation	
		n	%
30-40	30	00	00
41-50	79	04	5.06
51-60	114	16	14.03
61-65	66	24	36.36

patient outcomes and shorter hospital stays.⁸

Nearly 800,000 cardiac surgical procedures are performed annually in the United States.⁹ Despite the continued trends for patients undergoing these procedures to be of higher-risk and older than in the past, operative mortality remains low and has declined in some series on a risk-adjusted basis.¹⁰ In this setting, there is increasing attention being paid to peri-operative complications as an important source of patient morbidity and health-care resource utilization. Postoperative atrial fibrillation (AF) is one of the most frequent complications of cardiac surgery, and an important predictor of patient morbidity, prolonged hospitalization, and increased hospital cost.¹¹ Importantly, the frequency of this arrhythmia appears to be increasing, most likely due to increasing proportions of elderly cardiac surgical patients¹² As a result, this arrhythmia is the focus of intense investigative efforts as a means for improving patient outcomes.

The results of our study compared with other studies and observed that the frequency of postoperative AF is between 16% and 30%.¹³ It is seen that Absolute incidence rates for postoperative AF (and flutter) vary depending on many variables, including types of procedures, patient demographics, criteria for diagnosis, and methods of ECG monitoring. When diagnosed based on intermittently obtained 12-lead ECGs, for example, AF is reported in 11% of patients compared with an incidence of > 40% when Holter monitoring is employed.¹⁴ The clinical importance of symptomatic vs. asymptomatic episodes of AF is not known. In most contemporary series, the reported rates for postoperative AF range from > 30% for patients undergoing CABG surgery to nearly 60% for patients having combined CABG and mitral valve surgery.¹¹

In other studies the incidence of atrial fibrillation after cardiac surgery varies widely and ranges from 5% to 50%.¹⁵ The variations may be attributable to the intensity and duration of postoperative monitoring and to how atrial fibrillation was defined for the study. An incidence of 5% was reported in a sample of patients who were monitored for only 48 hours after CABG surgery.¹⁶ Kalman et al, used Holter monitoring for 80 hours and reported an overall incidence of atrial

fibrillation of 50%. However, only 36% of their patients had atrial fibrillation that required treatment.¹⁷

CONCLUSION

In conclusion, the frequency of AF following CABG is 15.2% with an overall frequency higher in male patients than female patients. Moreover, this study also concludes that the frequency of atrial fibrillation after coronary artery bypass grafting increases with age.

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