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ORIGINAL ARTICLE

Incidence and Clinical Implications of Postoperative Atrial Fibrillation in patients Undergoing On-Pump and Off-Pump Coronary Artery Bypass Grafting

UBAID ULLAH[1], AQEEL AHMAD[2], MUHAMMAD ALI RAFIQUE MIRZA[3], WASEEM REHMAN[4], MOHSIN MEHMOOD[5]
[1,4,5]Registrar, Department of Cardiothoracic surgery, Shaikh Zayed Hospital, Lahore
[2]Associate Professor, Department of Cardiothoracic Surgery, Shaikh Zayed Hospital, Lahore
[3]Professor, Department of Plastic and Reconstructive Surgery, Shaikh Zayed Hospital, Lahore
Correspondence to Dr. Ubaid Ullah, Registrar, Department of Cardiothoracic surgery, Shaikh Zayed Hospital, Lahore

ABSTRACT

Aim: Post-operative incidence and clinical implications of atrial fibrillation in patients having on-pump and off-pump CABG.
Place of Study: Department of Cardiovascular & Thoracic Surgery, Shaikh Zayed Hospital, Lahore.
Study Duration: 1 year
Design of Study: Quasi-experimental study
Methodology: 140 cases were selected. Non-probability purposive sampling technique was used.
Grouping: Group A (Off-pump) and Group B (On-pump).
Results: In group A, cases showed atrial fibrillation and in group B 23(32.9%) cases were noted. The incidence of postoperative atrial fibrillation was low in off-pump CABG as compare to on pump CABG.Clinical implications of postoperative AF such as, length of ICU & hospital stay, cerebrovascular events, wound infections and mortality of the cases are significantly reduced by using off-pump CABG.
Conclusion: Incidence of P/O atrial fibrillation is low in off-pump CABG as compare to on pump CABG
Keywords: Coronary Artery Bypass Graft (CABG), Atrial Fibrillation, on pump CABG.

INTRODUCTION

AF occurs in 10-40% of patients undergoing CABG[1]. This arises within 5 days of post-operative phase, mostly between 24 and 72 hours and in following first post-operative week[2]. One of the most common complication of cardiac surgery is AF. AF is a type of supraventricular tachyarrhythmia having uncontrolled atrial activation followed by mechanical dysfunctions[3].

The P/O atrial fibrillation causes four times increased risk of CVA as compared to cases of sinus rhythm[4]. Post-operative mortality is two times more in these patients[5].

METHODOLOGY

This quasi-experimental study was conducted in the Department of Cardiovascular & Thoracic Surgery, Shaikh Zayed Hospital, Lahore for a period of one year. Sampling technique used was non-probability purposive sampling. One hundred and forty cases with 70 in each group were enrolled. Patients of both genders with age ranges of 30-80 years coming for CABG were included. H/O AF, Valvular disease patients, emergency CABG patients, cardiac re-do cases were excluded. After approval from the ethical committee, 140 cases were selected and divided in two groups i.e. Group A with on-pump CABG and group B with off-pump CABG. Data was entered in SPSS version 23.

RESULTS

The detail of results is given in table 1. 140 cases with 70 in each group were enrolled.

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Table 1: Demographic characters and Postoperative outcomes

Demographic variables / Postop outcomes	Group A (off pump)	Group B (On pump)	P value
Gender			
Male	48 (68.6%)	38(54.3%)	P<0.05
Female	22 (31.4%)	32(45.7%)	
Mean age (years)	57.0 ± 7.5	57.2 ± 9.2	P>0.05
Mean hospital stay (days)	7.3 ± 1.1	8.9 ± 1.4	P<0.05
Mean ICU stay (Days)	3.4 ± 0.6	4.7 ± 1.3	P<0.05
Hypertension	66 (94.3%)	56 (80%)	P <0.05
DM	43 (61.4%)	55(78.6%)	P <0.05
Dyslipidemia	49 (60%)	36(51.4%)	P <0.05
Prolonged mechanical ventilation	8 (11.4%)	18(25.7%)	P<0.05
Smokers	37 (52.9%)	27(38.6%)	P<0.05
Stroke	0%	3 (4.3%)	P<0.05
Atrial Fibrillation	9 (12.9%)	23(32.9%)	P<0.05
Wound Infection	4 (5.7%)	9 (12.9%)	P<0.05

Statistical analysis: p<0.05 (significant), p>0.05 (non significant)

DISCUSSION

In this study, incidence of AF after CABG was 22.9% as a whole and it is in favor of one of the studies[7] In our study, incidence of atrial fibrillation in off pump cases was 12.9% and on pump cases was 32.9% in the on-pump group and difference was significant statistically (p<0.05). This study is in favor of the results of two other studies[8,12].

In one study, out of 939 subjects, on pump CABG was done in 556(59.21%) cases and off pump CABG in 383(40.79%). P/O AF occurred in 38 cases (9.9%) with off-pump and 93 cases (16.7%) with on-pump CABG groups

and difference was highly significant statistically (P<0.01)[11]. In this study, relationship of age >60 years with P/O AF was not established.

Regarding hospital stay, the development of atrial fibrillation post operatively in the on-pump CABG is associated with prolonged hospital stay in the ICU as compared to off-pump CABG. In one study, development of P/O AF prolonged hospital stay for 2-4 days[9].

Regarding mortality, cases of on pump CABG showed higher mortality rate who developed P/O AF when comparing with other group. This may be due to higher rates of infectious complications postoperatively. Our study is consistent with another study in which off pump CABG cases showed 13.4% AF postoperatively and on pump cases had 30.8% AF postoperatively (p<0.01)[6].

In this study, P/O AF was established as a significant predictor of stroke with p value <0.05. In this study, tight RCA lesion was associated with increased incidence of AF in on-pump CABG. This may be due to Ischemic insult caused by incomplete myocardial protection, incomplete myocardial revascularization and inappropriate positioning during off-pump CABG may result into post-operative atrial fibrillation.

In a study of Shroyer et al[10] regarding mortality with on-pump CABG between two studies, difference was comparable.

CONCLUSION

Postoperative atrial fibrillation very is in off-pump coronary artery bypass grafting (CABG) as compare to on pump CABG.

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