

Influence of Hypertension on Early outcome after Coronary Artery Bypass Surgery

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Abstract

Influence of hypertension on early outcome after coronary bypass surgery was studied during the period from January 2004 to December 2004, in the Department of cardiovascular surgery, National Institute of Cardiovascular Diseases, Dhaka, Bangladesh. Sixty patients undergoing conventional coronary artery bypass grafting in cardioplegic arrested heart were divided equally into two groups, 30 patients with hypertension (Group A) and 30 patients without hypertension (Group B). Study showed that in hypertensive group, 60.00% developed postoperative complications, whereas it is 13.30% of non-hypertensive group. Twenty percent of group A and none of the Group-B patients developed sternal wound infection. Leg infections were 39% and 13.3% in Group A and Group B respectively. Two patients from the Group A developed stroke during postoperative period, but none of the Group B patient had the same problem. Duration of average postoperative ventilation was 2.35 times greater in hypertensive patients than non-hypertensive patients. Mean postoperative hospital stay for Group A and Group B patients being 13.20 and 10.90 days respectively. The study showed that hypertensive patients were at higher risk of developing postoperative complications compared to patients without hypertension.

Keywords: Coronary Bypass, Hypertension, Outcome

Introduction

Coronary heart disease is the most common form of heart disease and the single most important cause of premature death in Europe, the Baltic States, Russia, North and South America, Australia and New Zealand.¹ Diseases of the coronary arteries are almost always due to atheroma and its complications particularly thrombosis. In 1975 the incidence of ischemic heart disease in Bangladesh was reported to be 3.3 per thousand and that in 1985 was 14 per thousand which indicates that the disease is increasing in our country.^{2,3}

Previous reports have suggested that hypertension has some deleterious effect after myocardial revascularizations. Candidates for coronary bypass surgery having a history of hypertension have increased 2 year mortality after the bypass procedure.⁴

To find out the influence of hypertension on early outcome after coronary bypass surgery, this study was conducted from January 2004 to December 2004, in the Department of cardiovascular surgery, National Institute of Cardiovascular Diseases (NICVD), Dhaka, Bangladesh.

Materials and Methods

Sixty patients undergoing conventional coronary artery bypass grafting (CABG) in cardioplegic arrested

heart were divided equally into two groups, 30 patients with hypertension (Group A) and 30 patients without hypertension (Group B), on the basis of the definition of hypertension of "Society of thoracic surgeons, National adult cardiac surgery database".⁵ Other major risk factors ischemic heart diseases (Hyperlipidemia, smoking, diabetes mellitus and family history of coronary artery disease) were matched between the groups.

All patients with clinical and angiographic evidence of coronary artery disease were included in the study regardless of age and gender.

Patients with Chronic Obstructive Airway Disease (COPD) and Valvular heart diseases were excluded from the study.

Detailed history of each patient under study was recorded, with special attention to the age, sex, risk factors for coronary artery disease (CAD) and co-morbidities for CABG. Important and relevant findings on thorough physical examinations and investigations were collected preoperatively and data during operative period, in the intensive care unit, in the ward and follow up in one month period after operation were recorded.

Results

In this study, we describe the complications of coronary artery bypass surgery (CABG).

Table-I
Sternal wound infection

Group	Sternal wound infection		Total patients	P-value
	Yes	No		
A (patients having hypertension)	06 (20.0%)	24 (80.0%)	30	0.01
B (patients having no hypertension)	00 (0.0%)	30 (0.0%)	30	

Table-I show that twenty percent of Group-A (patients having hypertension) patients developed Sternal wound infection after coronary bypass surgery, while none of the Group-B developed the same infection.

Table-II
Leg infection

Group	Leg infection		Total patients	P-value
	Yes	No		
A (patients having hypertension)	09 (30.0%)	21 (70.0%)	30	0.005
B (patients having no hypertension)	04 (13.3%)	26 (86.7%)	30	

Table-II show that thirty percent of the Group A patients were affected with leg infection after coronary bypass surgery, while only 13.3% of the Group B patients had the same infection.

Table-III
Stroke

Group	Stroke		Total patients	P-value
	Yes	No		
A (patients having hypertension)	02 (06.7%)	28 (93.3%)	30	0.246
B (patients having no hypertension)	00 (00.0%)	30 (100%)	30	

Table-III shows that two patients from the Group A developed stroke, but none of the Group B patient had the same problem; however, the difference was not clinically significant.

Table-IV
Post-operative complications

Group	Complications		Total patients	P-value
	Yes	No		
A (patients having hypertension)	18 (60.0%)	12 (40.0%)	30	0.001
B (patients having no hypertension)	4 (13.3%)	26 (86.7%)	30	

Table-IV shows that in patients having hypertension (Group A), 18 (60.0%) developed postoperative complications whereas 4 (13.3%) of patients having no hypertension (Group B) developed postoperative complications.

Table-V
Ventilation time

Group	Ventilation time		Total patients	P-value
	<24 hours	>24 hours		
A (patients having hypertension)	24 (80.0%)	06 (20.0%)	30	0.03
B (patients having no hypertension)	29 (96.7%)	01 (03.3%)	30	

Significant difference was observed between the group A and group B patient with respect to ventilation time. In Group A, 20% patients needed more than 24 hours ventilation whereas only one patient (3.3%) in Group B needed the same.

Regarding intensive care unit and hospital stay and mortality, no significant differences were observed between the two groups.

Discussion

Coronary artery bypass surgery (CABG) is a well established surgical procedure in Bangladesh. Patients with co-morbidity have greater risk of post-operative complications.

The present study did not find any significant association between demographic variables (age and sex) and postoperative complications

In this study it is shown that complications after CABG in hypertensive patients far outweighed that among normotensive patients. The influence of risk factors (like smoking, diabetes mellitus, hyperlipidemia, family history of CAD) on number of postoperative complications as compared between two groups did not show any significant relationship.

The risk of developing complications was four times greater in hypertensive patients.

As postoperative complications were compared between the groups, it was revealed that 20% of the cases(Group-A) developed sternal wound infection after CABG surgery, while none of the Group-B developed the same infection .Some 30% of the Group-A and 13.3% of the Group-B, had leg infection. In a study by Scott et al, hypertensive patients were found at significant risk of postoperative leg infections (OR = 5.44; 95% CI 2.32, 12.74) which bears consistency with findings of the present study. Their study also demonstrated that hypertensive patients remained at increased risk of leg infection despite adjustment for age, female gender, smoking diabetes, race, renal failure and family history of CAD.⁶

In the result section we have seen that two patients from the Group A developed stroke. Gupta et al identified stroke as a major complication of CABG and reported rates range from 0.4% to 13.8%. Recognized correlates were prior stroke, hypertension, increasing age and diabetes mellitus.⁷

Roach GW et al. carried out a prospective investigation of adverse cerebral outcomes after elective CABG surgery.⁸

In the present study prolonged ventilation time was also found to be associated with the Group A ($p < 0.05$). The likelihood of prolonged ventilation time for hypertensive patients was 6.5 times than their counterpart. The mean ventilation time for Group A and Group B were 19.47 ± 5.11 and 16.57 ± 4.64 hours respectively. The ICU stay did not differ between the cases and controls indicating that hypertension did not have any influence in prolonging the ICU stay. Total post-operative stay was higher in hypertensive patients. Two patients died in hypertensive group while only one died in normotensive group, although the difference was not found to be statistically significant.

Conclusions

Rational measures should be undertaken to contain the post-operative complications of CABG in hypertensive patients to minimal tolerable level. It is recommended to design strategies to improve outcome of CABG operation.

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