Original Article

Effect of Great Saphenous Vein Harvesting in Lower Limb Following Coronary Artery Bypass Grafting in Diabetic Patients

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Abstract

Background: *Coronary artery bypass graft Surgery is an established method of myocardial revascularization. Great saphenous vein is the conduit of choice for all cardiac surgeons.* ***Objective:*** *To compare the effect of great saphenous vein harvesting on lower limb such as swelling, pain, discharge with diabetic and non diabetic CABG patients in whom great saphenous vein was used as a conduit.* ***Materials and Methods:*** *It was a cross sectional study on 60 patients who underwent CABG during July 2003 to June 2005 in department of cardiovascular surgery, National Institute of Cardiovascular Diseases (NICVD).* ***Results:*** *The age in group A (Diabetic) ranged from 40-72 years in group B (Non Diabetic) the age range was 40-65 years. Myocardial infarction and Congestive cardiac failure were the predominant risk factors in both age groups. There was no motor or sensory disturbances post operatively. Some patients developed swelling, tenderness, paresthesia in both group but it was not statistically significant.* ***Conclusion:*** *Morbidity occurs in both diabetic and non diabetic patients with certain complications like numbness, paresthesia, swelling etc. at the harvesting site.*

Key words: *Coronary Artery Bypass Graft, Great Saphenous Vein.*

Date of received: *10.02.2020.*

Date of acceptance: *15.05.2020.*

KYAMC Journal.2020;11(2): 59-61.

DOI: https://doi.org/10.3329/kyamcj.v11i2.48415 .

Introduction

Coronary artery disease is now becoming one of the major causes of sudden death in third world countries like Bangladesh as the socio economic condition of the people improved a lot. It affects more than 13 million Americans today and has resulted in more than 573000 coronary artery bypass operations performed in USA in 1995.[1] Diabetes mellitus is a recognized risk factor for the development of coronary artery diseases and independent risk factor for mortality from myocardial infarction.[2] Diabetes is also a risk factor in association with myocardial revascularization procedure but according to recent studies CABG may be the treatment of choice in this group of patients.[3] Great saphenous vein has been the conduit of choice for a long period of time. In a study done by Utley[4] it was found that leg wound complications was 24.3% and in another study of Delaria[5] it was 1%. Leg swelling, cellulites, discharge, tingling and numbness are commonly found in harvested lower limb. But if diabetes can be controlled pre and post operatively, there is less wound infection, less hospital stay and cost of treatment.

Materials and Methods

It was a cross sectional study done in the department of cardiac surgery, National Institute of Cardiovascular Diseases (NICVD), Dhaka. The Study period was from July 2003 to June 2005 total 60 Patients were taken who were divided in to 2 groups, 30 Patients in each group.

1. Group A: Diabetic Patients Undergoing CABG with saphenous vein as conduit.

2. Group B: Non Diabetic Patients undergoing CABG with great saphenous vein as conduit.

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Selection of Patients:

a) Inclusion criteria was All elective CABG Patients with great saphenous vein as a conduit

b) Exclusion criteria were emergency CABG, Redo CABG, CABG associated with valvular heart disease, CABG associated with hepatic & renal insufficiency.

Results

Among the total 60 Patients only 1 Patient was female. (Table I)

Table I : Distribution of the study by sex

Sex	Study Subject Group A (n=30)	Group B (n=30)	Total (n=60)	Pvalue
	No (%)	No (%)	No (%)	
Male	29 (96.7)	30 (100.00)	59 (98.3)	
Female	1 (3.3)	0 (0.0)	1 (1.7)	1.000 (ns)
Total	30 (100)	30 (100)	60 (100)	

ns= Not significant

The age in group A (Diabetic) ranged from 40-72 years with mean±SD of 54.9±7.9 years. In Group B (Non Diabetic) the age range was 40-65 Years with a mean ± SD of 53.0±7.2 years (Figure 1)

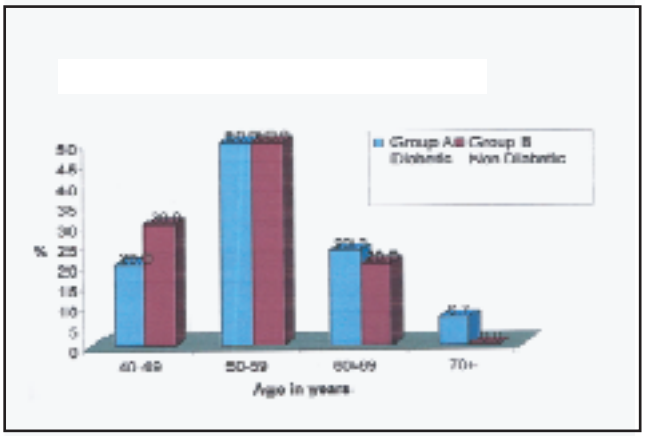

Figure 1: Distribution of the study patients by age.

The risk factors were comparably distributed in both the groups, among group A 53.3% had myocardial infarction followed by congestive cardiac failure (10.0%) where as among group B patients 70% had myocardial infarction followed by congestive cardiac failure (13.3%) and cerebrovascular diseases (6.7%) (Table 11).

Table II: Distribution of Study Patients by risk factors

Risk factors	Study subject Group A (n=30)		Group B (n=30)		Total (N=60)		p value
	No	%	No	%	No	%	
Congestive cardiac failure	3	10.0	4	13.3	7	11.7	1.000 (ns)
Myocardial infarction	16 0	53.3 0.0	21 2	70.0 6.7	37 2	61.7 3.3	0.184 (ns)
Cerebrovascular diseasc							0.246 (ns)

Group A= Diabetic patients
Group B= Non diabetic patients
p value reached from Fisher's Exact test
ns= Not significant

Post Operative Changes at harvest site:

Analysis found that highest percentage of patients of group A Complained of pain (26.7%), numbness (30%), swelling in wound area (20%), paresthesia (16.7%), change of temperature (16.7%), infection (6.7%). However, in group B patient, highest percentage patients had pain (30%), swelling (23.3%), paresthesia (20%), numbness (23.3%), change of temperature (13.3%), infection (6.7%) (Figure 2).

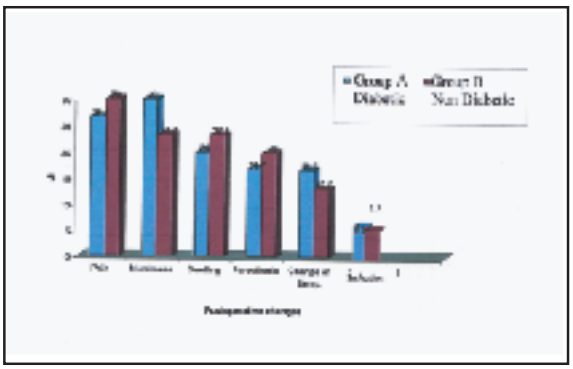

Figure 2: Distribution of Study patients by post operative changes at the harvest site.

Discussion

As Ischemic heart disease is increasing in our country, large numbers of patient are opting for CABG. The study was conducted in NICVD which included 60 patients of whom 30 were diabetic (Group A) and 30 were non diabetic (Group B). The age in group A ranged from 40-72 years with mean ± SD 54.9 ±7.9 years. In group B, the age range was 40-65 years with a mean ± SD of 53.0 ± 7.2 Years. However, relatively younger patients underwent CABG in our study than that of Allen.[6] In the study done by Szabo[7] mean age group A was 64.2±9.4 years and in group B it was 65.7±9.3 years. Our Study also showed male predominance almost 98% which was similar to the study of Ischaemic heart disease patient by Malik[8] and Amanullah.[9] Myocardial infarction, congestive cardiac failure was the predominant risk factors in both age groups. The study done by Detre[3], Szabo[7], and Furnary[10] showed similar results. Mean harvesting time in both group of

The results were comparable to the study done by Bond[11], and Bitondo.[12] Mean±SD of cardiopulmonary bypass time in minute was 126.7±15 in group A and 127.3±17.1 min in group B. Highest percentage of CPB time in the range 120-129 min (44.4%) in group A and 40% in group B. In the study done by Szabo[7] mean CPB time for group A was 86.7±28.4 min and 81±30.6 min in group B. The study done by Patella[1], mean CPB time was 133.3±58 min. The highest percentage of wound length in group A was in the range of 35-39 cm (56.7%) and for group B was in the same range as 36.7% .In the study done by Allen[6] mean wound length was 39.8±13.8 cm and it was 42.1±13.6cm in a study done by Bitondo.[12] Three patients (10%) in group A, developed redness and 2 patients (6.7%) in group B developed redness. Seventeen patients presented with residual pain of which 26.7% were in group A and 30% in group B. However, all of them improved by 3 months. The findings are similar to the findings of Garland[13], and Bond.[11] Numbness was found in 12 patients of which7 (23.3%) in group A and 5(16.7%) in group B. In the study done by Garland,[13] 61% of patients developed numbness which reduced to 37% within 3 months. Thirteen patients complained of swelling of which 6 (20%) was in group A, 7(23.3%) was in group B which reduced to 3.3% in both groups in subsequent follow up. These findings are consistent with the findings of Garland.[13] About 16.7% in group A and 20% in group B presented with paresthesia. After 3 months follow up, it reduced to 10% in group A and 6.7% in group B. It was similar to the study done by Bond.[11] Altered temperature sensation was found in 9 patients of which 16.7% were in group A and 13.3% were in group B. All the patients had normal motor function postoperatively. Examination findings revealed 4 patients (6.7%) developed wound infection at the harvest site. Of these, 2 patients (6.7%) were in group A and 2 patients (6.7%) were in group B. The wound infection was 10.07% in a study done by Bond[11] and 26% in a study done by garland.[13] Wound infection was significantly related to harvesting time and cardiopulmonary bypass time. But there was no significant relationship between wound infection and wound length. The findings are similar to the findings of Bond.[11]

Conclusion

It was found that morbidity occurs in both Diabetic and non-diabetic patients. Both group of patients can experience paresthesia, numbness, swelling, at the harvest site but no significant difference of complication were found between the two groups. We recommend that great saphenous vein can be used with less morbidity in Diabetic patients for coronary revascularization and emphasis should be given on using proper harvesting technique to prevent intimal damage, nerve injury and surrounding soft tissue injury.

Acknowledgement

I would like to express my gratitude to all patients for their cooperation, patience, and help. I also like to thank all the doctors, teachers, staff of the department of cardiothoracic surgeryof NICVD for their extensive inspiration, encouragement showed to me during my research work.

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