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In-Hospital Complications after Coronary Stenting

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Abstract: The commonest cause of IHD is atherosclerotic narrowing of coronary arteries which may be silent or symptomatic. The incidence of Coronary Artery Disease (CAD) in younger i-e (<38 year population) is increasing. To evaluate the rate of in-hospital complications after coronary stenting in a single center and compare it with multicenter randornosied studies. This is analytical observational cross sectional study. Patients admitted to NICVD with established IHD and angiographic evidence of significant (>70% lesion) CAD. Study included fifty male and female patients with mean age 58.8 years admitted for Percutaneous Coronary Intervention (PCI) and stenting from March 2000 to August 2000. Baseline clinical and angiographic findings were recorded. During procedure patients were specially watched for on table complications up to hospital discharge. All the information was recorded on specially designed proforma. complications were observed and compared with other studies. Statistical data was analyzed on SPSS software program. The NICVD group of patients were younger, less hypertensive and hypercholestrolemic as compared to the comparison group. Coronary dissection rate was significantly decreased in NICVD group other complications are almost comparable with other centers. PCI with stenting is equally successful procedure at NICVD for single vessel disease.

Key words: Stents · angioplasty · complications · coronary artery disease

INTRODUCTION

More than eleven million Americans have coronary artery (CAD), which causes more deaths, disability and economic loss in industrialized nations than any other group of diseases. Given the current magnitude of the problem and the increasing prevalence of CAD which is anticipated because of the aging of the population, the recognition, management and the prevention of CAD are of major health importance [1]. The commonest cause of IHD is atherosclerotic narrowing of coronary artery, which may be silent or symptomatic [2]. The incidence of CAD in younger i-e (<38 year population) is increasing [3, 4]. Younger patients are also reporting for acute coronary syndrome including myocardial infarction [3, 4]. Silent or painless myocardial infarction may occur in patients who are elderly or diabetic and many remain completely asymptomatic. Genetic basis of CHD is complex and involves >100 genes that influence the development of atherosclerotic lesions [5]. The risk factors in these cases include diabetes mellitus, cigarette smoking, hypertension, obesity, hyperlipidemia, age, male gender and metabolic syndrome.

Available treatment modalities are medical, catheter based and surgical treatment. Each has got its own risk benefit ratio and limitations.

Patients with non-significant angiographic lesions, functional class II or III respond to medical treatment. When these lesions become significant revascularization is recommended either by Percutaneous Coronary Intervention (PCI) or Coronary Artery Bypass Grafting (CABG). Coronary stent implantation has become major mode of myocardial revascularization through out the world. In many centers up to 80% of Percutaneous interventions are accomplished by means of stent placement [6]. Diabetes Mellitus has a 45% higher risk of restenosis while current smokers have less restenosis [7, 8]. The purpose of our study is to evaluate in hospital complications during and after the coronary stenting in patients of atherosclerotic CAD at National Institute of Cardiovascular disease and compare it with other standard trials.

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Purpose of Study: To evaluate the in hospital complications at NICVD after coronary stenting and compare it with other centers.

MATERIALS AND METHODS

The study included 50 patients, 36 male, 14 female of age 45 to 60 years were admitted in NICVD for PCI and stenting from March 2000-August 2000. Patients suffering from other diseases like carcinoma, Renal failure, pulmonary embolism, metabolic disorders and hepatic diseases were excluded from the study. Base line angiogram taken and coronaries especially the target vessels were defined properly. Sequential balloon dilatation, stenting with or without pre balloon dilatation, direct stenting their time duration and atmospheric pressure and pharmacological intervention observed.

During procedure, patients were especially watched for on table complications up to hospital discharge. All information was recorded on study proforma and compared with other studies. The statistical data was analyzed on SPSS software programme.

Study design: Analytical observational cross sectional study.

RESULTS

Base line clinical and angiographic characteristics are listed in Table 1. There was statistically significant difference in mean age, h/o hypercholesterolemia, hypertension and smoking between the two groups. No statistical difference between male sex and diabetes.

Baseline angiographic characteristics of the two groups are shown in Table 2. 68% of NICVD patients suffered from Single Vassd Disease (SVD) as compared to 48% of other group which statistically significant.

Table 3 shows procedural success rate between NICVD and other group. Coronary dissection rate was significantly decreased in NICVD group (18% Vs 23% P =< 0.001).

Student paired t-test was applied. Statistical data are shown in Table 4. In NICVD group one patient expired during PCI of LAD system which is statistically significant (20% Vs 0.8%). Other complications were not of statistical significance.

Table 1: Baseline clinical characteristics of the study group

Variable	NICVD (n = 50)		Other center (89,90) (n = 3953)	P value
Age	58.85 Sd±707 yrs.		64.6SDI 12.1	<.001
	Patients	%		
Male Sex	36 pts	72	71.8	NS
History of diabetes	12 pts	24	23.3	NS
History of hypertension	22 pts	44	60.7	<0.001
History of hypercholestrolemia	04 pts	08	63.8	<0.001
Current/former smoker	03 pts	6	65.5	<0.001

Table 2: Baseline angiographic characteristics of the study groups

Variable	NICVD study group (n = 50)		Other center study group (89,90) (n = 3953)		P value
No. of diseased vassels	Cases	%		%	
1	35	70		48	<0.001
2	14	27		35.5	<0.01
3	01	02		16.5	<0.001
Lesion type			case	%	
A	3	6	45	6	NS
B	27	54	505	34	<0.001
C	20	40	378	1	<0.01
LAD	24	48	349	45	NS
LCX	10	20	166	1	NS
RCA	16	32	151	19	NS

Table 3: Comparison

S. No	In-Hospital Complication	NICVD (n = 50) Case	%	Other center (89,90,91) (n = 3953)	P value
1	Death	1	2	1.6	NS
2	Myocardial infarction	2	4	4.15	NS
3	Emergency CABG	0	0	1.65	NS
4	Emergency recatheterization	1	2	2.5	NS
5	Coronary perforation	0	0	0.0	NS
6	Coronary dissection	9	18	23.0	P<.001
7	Acute closure	1	2	2.4	NS
8	Ventricular arrhythmias	1	2	1.5	NS
9	Side branch occlusion	0	0	0.0	NS
10	Femoral artery reepair	1	2	1.5	NS
11	Blood transfusion	0	0	0.0	NS
12	Coronary embolus	1	2	1.5	NS
13	Cardiac temponade	0	0	0.0	NS
14	Strok	0	0	0.1	NS
15	Coronary vasospasm	1	2	0.7	NS
16	puncture site hematoma	1	2	1.5	NS

Table 4: Student's paried t-test

Mean	Stand DEV.	Stander D error of mean	95 % Confidence interval (CI) of difference				
			Lower	Upper	t		
-1.930	0.2564	2.564 E-02	-1.980	-1.879	-75.264		
						df.	Sign.
						99	.000

There was only significant decrease in the rate of coronary dissection in NICVD group P < 0.008. The occurrence of other complications in NICVD group with other study group were not statistically significant df 15, 95% confidence interval of difference 1.73-1.119 with standard of mean 0.669 (P = 0.652).

Statistical analysis: Mean and Standard deviation was determined. Students t test was applied to determine the significance. P<0.05 was considered significant.

DISCUSSION

This study demonstrate that, the in hospital complications after coronary stenting at NICVD were almost equal when compared with other centers [9].

At NICVD complication rate of coronary dissection was significantly low as compared to study performed by Wilson *et al.* in 2000. That might be due to factors like selection of younger patients at NICVD than at other centers. Most of the patients had single vessel short eccentric B-type lesion, anatomically and technically ideal for PCI and stenting.

Other reason for decreased rate of coronary dissection was that one- fifth of NICVD patient's undergone direct stenting without pre-balloon dilatation. A study by Penteusis D *et al.* 1998 shows that direct stenting (DS) may improve clinical out come potentially by decreasing the number of balloon inflation and decreasing ischemia time.

Herzl. AssaliA *et al.* 1998 studied that DS was potentially less traumatic to the vessel wall and may cause less ischemia, dissection and disruption to the distal flow, which may be the case when thrombus is present. Residual dissections after stenting have been associated with increased risk of major cardiac events. The frequency of dissection in DS group is lowered significantly. More over the use of stent in a bail out situation after severe dissection had been examined a worse out come supporting the possibility that pre dilation might be harmful in a small number of patients. This potential risk is diminished by DS technique.

Joseph Lindsay JR *et al.* [10] gave a study in 1999 that only the group of physicians (operators) performing >50 cases annually (high volume operators) had less chances of major adverse cardiac events (MACE) (Death, stroke, MI, E-CABG) and all the physicians who had performed PCI- stenting at NICVD were high volume operators [11, 12].

So in summary the rate of in hospital complications after coronary stenting were decreased due to selection of the relatively younger patients with single technically much suitable lesion for PTCA and stenting. The technique of DS has been applied on considerable number of patients responsible for the decreased rate of coronary dissection. The physicians performing PCI and stenting at NICVD has got adequate skill and they were high volume operator.

CONCLUSION

- Fifty consecutive patients of IHD were included in this study at NICVD Karachi.
- Majority of the patients were of age group 40-50 year's male of NYHA- functional class III. Most female patients were diabetic.
- Common symptoms noted were typical chest pain (80%) with NYHA functional class III.
- There was significantly less coronary dissection observed in NICVD group.
- All the major and minor complications are not statistically significant.
- The findings of this study are consistent with the other studies. However this study was done on small scale and for a short time period, for conformation of findings, a larger scale and long time study is needed.

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