Are There Any Differences in Mortality, Complications and Late Outcome of Percutaneous Coronary Intervention in Patients with Different Educational Levels?

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Abstract

Background- It has been shown that the socioeconomic and cultural status of adults in industrialized countries is related to cardiovascular disease mortality and morbidity. It has been shown also that higher education was associated with reduced mortality from all causes, cardiovascular diseases, and coronary heart disease in both genders. The aim of this study was to evaluate whether or not educational level of patients influences success, mortality rate, complications and late outcomes of PCI.

Methods- 1030 consecutive patients who underwent PCI in Tehran Heart Center from April 2003 to March 2004 were analyzed. The patients were divided based on their educational level in three groups: Group A: no education, Group B: below diploma (high school), Group C: diploma and above. Results were analyzed regarding success rate, early and late outcomes in each educational group. Follow up period was about 8 months.

Results- 25% (256) of our patients were in group A, 45% (461) in group B and 30% (315) in group C. There were significant differences regarding incidence of hyperlipidemia, previous MI, CABGS or PCI. The rate of ad hoc PCI procedures was significantly higher in group C compared to groups A and B.

Conclusion- This study has shown no significant relationship between the level of education of patients who underwent PCI procedure and their procedural success rate, mortality and other early and late outcomes ***(Iranian Heart Journal 2005; 6 (3): 49-53).***

Key words: education level Ë percutaneous coronary intervention

Socioeconomic factors and their relationship to human health have well been studied. However, it has also been shown that the socioeconomic and cultural status of adults in industrialized countries is related to cardiovascular disease mortality and morbidity. These associations have been mostly explained by differences in known cardiovascular risk factors between social classes.

Some other studies showed that education is a strong protective factor both for all-cause and CAD mortality. Only a small part of this effect can be explained through conventional risk factors. It has been shown also that higher education was associated with reduced mortality from all causes, cardiovascular diseases and coronary heart disease in both genders.

Although the relationship between CAD (mortality, risk factors) and educational level has been studied, we did not find any article or abstract about the association between outcomes of PCI and educational levels. The aim of this study was to evaluate whether or not educational level of patients influences

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success, mortality rate, complications and late outcomes of PCI.

Methods

The data of 1030 consecutive patients who underwent PCI in Tehran Heart Center from April 2003 to March 2004 were analyzed regarding their educational level in three groups: Group A: no education, Group B: below diploma (high school), Group C: diploma and above.
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Results

According to our analysis 25% (256) of our patients were in group A, 45% (461) in group B and 30% (315) in group C.
There were significant differences regarding incidence of hyperlipidemia, previous MI, CABGS or PCI (Table I). There were no significant differences between the three groups regarding angiographic characteristic (Table II).

Table 1: Clinical characteristics

Characteristic	Group A	Group B	Group C	P value
Age over 65	130(50.8%)	129(28.0%)	38(12.1.%)	.000
Female	142(55.5%)	113(24.5%)	36(11.5%)	.000
Male	114(44.5%)	348(75.5%)	277(88.5%)	.000
Hx of hyperlipidemia	114(44.5%)	214(46.4%	153(48.9%)	.57
Hx of hypertension	112(43.8%)	142(30.8%)	70(22.4%)	. 000
HX of DM	71(27.7%)	109(23.6%)	49 (15.7%)	. 002
Family Hx of CAD	140(51.6%)	123(26.7%)	96 (30.7%)	. 000
Current smoker	21(8.2%)	86(18.7%)	64 (20.4%)	. 000
Previous MI	78(30.5%)	175(38.0%)	128(40.9%)	.032
Previous CABG	1(0.4%)	169(3.5%)	9(3.0%)	.039
Previous PCI	10(4.0%)	25(5.5%)	24(7.9%)	.134

Table II. Pre-procedural angiographic characteristics

	Group A	Group B	Group C	P value
Total stenosis	39(10.7%)	69(11.0%)	45(10.2%)	925
Ostial Lesion	23(6.3%)	20(3.2%)	14(3.2%)	.031
Proximal Lesion	82(22.5%)	167(26.6%)	122(27.7%)	.205
Long Tubular Lesion	168(46.0%)	301(47.9%)	221(50.2%)	.489
Diffuse Lesion	49(13.4%)	80(12.7%)	62(13.3%)	.813
Calcified Lesion	51(1.4%)	7(1.1%)	4(0.9%)	.825
Bifurcation Lesion	30(8.2%)	44(7.0%)	39(8.9%)	.521
Thrombus	10(2.7%)	21(3.3%)	8(1.8%)	.321
Multi Vessel Disease	119(62.6%)	175(55.6%)	134(56.3%)	.236
Stenotic Vessel				
LAD	168(46.0%)	300(47.8%)	234(53.2%)	.624
LCX	69(18.9%)	93(14.8%)	62(14.1%)	
RCA	77(21.1%)	153(24.4%)	94(21.4%)	
AHA Type				
A	55(16.8%)	12(23.3%)	11(19.0%)	.248
B1	111(33.9%)	152(27.9%)	118(29.1%)	
B2	76(23.2%)	126(23.2%)	98(24.2%)	
C	85(26.0%)	139(25.6%)	112(27.7%)	
Low EF	26(12.6%)	74(19.2%)	54(19.6%)	.08

The rate of ad hoc PCI procedures was significantly higher in group C compared to group A and B.
The rate of using drug eluting stents was significantly higher in group C compared to groups A and B.
There were no significant differences in rate of direct, primary and secondary stenting between the three groups (Table III).

Table III. Procedural characteristics

	Group A	Group B	Group C	P value
Adhoc PCI/Elective	22(6.0%) 343(94%)	42(6.7%) 586(93.3%)	53(121%) 387(88.0%)	.002
Procedure Type Balloon angioplasty Direct stenting Primary stenting Secondary stenting	58(16.3%) 148(41.6%) 132(37.1%) 18(5.1%)	72(12.5%) 283(46.0%) 234(38.0%) 21(3.4%)	51(11.8%) 179(41.2%) 187(43.1%) 17(3.9%)	0175
Stent Type Drug eluting (DES)	5(1.4%) 2(1.0%)	20(3.2%) 15(3.9%)	41(9.3%) 31(11.5%)	.000 .000

There were no significant differences between the three groups regarding procedural success rate and early complication during hospitalization (Table IV).

Table IV. Early results and in-hospital complications

	Group A	Group B	Group C	P value
Successful procedure	340(93.2%)	595(94.9%)	423(96.1%)	.162
Acceptable procedure	13(3.6%)	15(2.4%)	12(2.7%)	.554
Procedural complications Dissection	14(3.8%)	21(3.3%)	14(3.2)	.870
No reflow	0	1(.2%)	0	.495
Slow flow	0	1(.2%)	2(.5%)	0
Perforation	0	2(.3%)	0	.277
VF or VT	0	2.(2%)	0	.277
In-hospital MI	0		0	.539
In-hospital Non Q wave MI	3(1.2%)	1(.2%) 4.(.9%)	7(2.2%)	.260
In-hospital CVA	0	0	1(.3%)	.318

Also regarding late outcomes and major adverse coronary events (MACE), there were no significant differences between the three groups (Table V).

Table V. Late outcomes

	Group A	Group B	Group C	P value
Nonfatal MI	3(1.3%)	3(.7%)	0	.048
Death	2(.9%)	1(2%)	0	.182
Re-PCI	0	11(2.6%)	8(2.9%)	.038
CABG	3(1.3%)	6(1.4%)	2(.7%)	.690
TVR	3(1.3%)	16(3.8%)	6(2.2%)	.131
TLR	0	9(2.2%)	3(1.1%)	.062
MACE	8(3.1%)	18(3.9%)	6(1.9%)	.294

Discussion

The association between socioeconomic status and cardiovascular risk factors has been the subject of intense interest in recent years.[15]

Educational level is a relatively stable variable in adulthood, whereas many other indices of social class are more often subject to change.

Some studies have shown a significant negative relationship between the level of education and total mortality and CAD mortality both for men and women. After adjustment for risk factors, the relationship was still present.

Education or social status may be related to the coagulation factors, diet, physical exercise, access to health services, disease prevention and prophylaxis, treatment compliance, knowledge of manifestations of disease and risk factors. Type A personality was also more prevalent with higher education. It was however concluded that well educated people were more receptive to advice on a healthier lifestyle.

Studies regarding serum cholesterol levels and social rank are contradictory,[21,25,27] but blood pressure and body mass index have shown a negative correlation with education.[21,25] Other studies have shown a decreasing trend in smoking with more education.[21,25]

Our study has shown an increasing trend in smoking with higher educational level.

Regarding systemic hypertension and diabetes mellitus, there was less prevalence of these two risk factors with higher educational level but there were no significant differences between the three educational groups regarding hyperlipidemia.

Conclusion

Our study could not show any significant differences regarding early and late outcomes including mortality between the three groups of educational levels. This result may be influenced by several factors: firstly may be the very low rate of mortality in all groups and insufficient total number of patients; secondly this may be due to the fact that procedural complications and mortality are more related to operator technique, complexity of lesions and peri-procedural care compared to educational level of patients. So we suggest this study be performed in a multicentric study with a higher patient volume.

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