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Long-term Survival with Revascularization in South Asians Admitted with an Acute Coronary Syndrome (From the Alberta Provincial Project for Outcomes Assessment in Coronary Heart Disease [APPROACH] Registry)

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Running Title: ACS survival in South Asians

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ABSTRACT:

People of South Asian (SA) descent are particularly susceptible to acute coronary syndromes (ACS). Yet, little information exists regarding their overall prognosis. The purpose of this study was to compare short and long-term clinical outcomes of SA and European Canadians admitted with an ACS. Using the Alberta Provincial Project for Outcomes Assessment in Coronary Heart Disease (APPROACH) registry, 63,393 patients with ACS were reviewed (January 1999 –Mar 2012). After excluding Chinese patients, 1825 SAs were compared to 60,791 European Canadians. Both groups were propensity matched and outcomes were compared. Adjustment was performed using a 3:1 propensity matching technique. Adjusted 30-day and 1-year mortality were similar between SA and European patients with ACS (2.6% vs. 2.7%, p=0.93; 5.0% vs. 4.8%, p=0.75). Repeat angiography did not differ (9.9% vs. 9.2%, p=0.35) yet repeat revascularization within 1 year was higher in SA patients (9.8% vs. 7.6%, p<0.01). Improved long-term survival (median 64 months, interquartile range [IQR] 66 months]) was noted with SA patients (hazard ratio [HR] 0.82, 95% confidence interval [CI] 0.71-0.95). In particular, long-term survival was observed in SA patients receiving CABG (HR 0.75, 95% CI 0.52-1.08) and PCI (HR 0.75, 95% CI 0.59-0.96). In conclusion, SA patients treated with revascularization appear to have improved long-term survival after ACS, compared to European Canadians. As such, clinicians should be cognitive of ethnic-based outcomes when determining therapeutic strategies in patient management.

Keywords: South Asian; ethnicity; acute myocardial infarction; revascularization; long-term outcomes

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INTRODUCTION

South Asians (SA) are individuals whose ethnic roots originate from the Indian subcontinent which includes India, Pakistan, Sri Lanka, Nepal, and Bangladesh. While this population is not completely homogenous, studies continue to show migrants of SA descent appear to be particularly susceptible to coronary artery disease (CAD).[1,2] Similar risk has been observed in individuals from the Indian subcontinent.[3] SA patients present on average 5 years earlier with an acute coronary syndrome (ACS) compared to their European counterparts.[4] As a result, growing awareness about SA ethnicity has become increasingly relevant. Accordingly, using a large prospective comprehensive clinical registry, we compared short and long-term clinical outcomes of SA and European Canadians admitted with ACS.

METHODS

The Alberta Provincial Project for Outcomes Assessment in Coronary Heart Disease (APPROACH) is a prospective clinical data collection initiative encompassing all patients undergoing cardiac catheterization in the province of Alberta, Canada, since 1995. The registry contains detailed clinical information including each patients age, sex, ejection fraction and presence or absence of previous myocardial infarction, congestive heart failure, cerebrovascular disease (CVD), peripheral vascular disease (PVD), chronic obstructive pulmonary disease (COPD), present/prior smoking, renal function, renal dialysis, hyperlipidemia, hypertension, diabetes mellitus, liver disease, gastrointestinal disease, and malignancy as well as indication for revascularization. APPROACH tracks therapeutic interventions including balloon angioplasty, type and location of coronary artery stent. It also includes previous or subsequent revascularization by coronary artery bypass grafting (CABG) surgery or percutaneous coronary

intervention (PCI). Extent of CAD is documented and reported via standardized coronary anatomy diagrams. Mortality is tracked through quarterly linkage to data from the Alberta Bureau of Vital Statistics.[5]

According to Statistics Canada (2001 census), most of Alberta's population is European (85-90%) in origin, followed by Chinese (3-4%) and SA (3-4%).[6] The current study is restricted to patients enrolled in APPROACH of SA or European descent who are admitted to hospital with an ACS. NAM PEHCHAN software was used to identify patients of SA ethnicity.[7] This software contains a database of SA names that are matched according to complete name or name- stem using the first 5 letters of the patient's surname and has been used in ethnicity-based research across different specialities.[8,9] Religious origins and language of individuals identified as being SA are reported as well. Validation has shown that NAM PEHCHAN sensitivity is highest among Muslim (92%) and Sikhs (86%) and somewhat lower in Hindus (62%). However, overall specificity exceeds 95% for all ethnic groups. [10] Patients of Chinese descent were excluded using the surname algorithm validated by Quan et al[11] to define Chinese ethnicity, which reports a sensitivity and specificity of 78% and 99.7% respectively. The remaining population was identified as being of European lineage.

Patient characteristics among those of SA and European descent were compared using χ^2 or t tests, where appropriate. A P value <0.05 was regarded as significant. The survival analysis was based on the subject being alive at the end of the study period. The cohort included mortality data on all patients up to April 2013. We have a minimum of one year of follow-up data for mortality for all patients with some patients having up to over 10 years.

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As in all non-randomized studies, the direct comparison of two distinct groups can be misleading because the groups generally differ systematically. To obtain a comparable distribution of clinical variables among SA patients and Europeans we used the Rosenbaum and Rubin propensity score-matching technique.[12] This technique allows for a high number of confounding variables and has been defined as being sufficient to produce unbiased estimates of the average group effects. The propensity score was calculated using logistic regression. Multiple variables (age, sex, cerebrovascular disease, congestive heart failure, chronic obstructive pulmonary disease, renal function, renal dialysis, diabetes mellitus, hyperlipidemia, hypertension, malignancy, peripheral vascular disease, present/prior smoker, prior myocardial infarction, prior PCI, prior thrombolytic therapy, indication for catheterization, coronary anatomy, and ejection fraction) were used, with SA ethnicity as an outcome (non-randomized exposure). Greedy matching techniques were applied (SAS version 9.2; SAS Institute Inc., Cary, NC) to select 3 European patients (controls) for each SA patient (cases) by choosing the patients with the nearest propensity score, that is, within 3 decimal places of the propensity score for each case. A 3:1 propensity matched technique was used to reduce variability and improve bias.[13] Overlap of propensity scores between SA and European patients were evaluated using histograms and descriptive statistics. Differences in baseline factors between groups were calculated before and after propensity adjustment using absolute standardized differences in covariate means to assess balance.[14]

RESULTS

After excluding patients of Chinese descent, a total of 62,616 patients presented with an ACS requiring cardiac catheterization (January 1999 to March 2012). Of these 1825 patients (2.9%) were of SA descent. Table 1 outlines the unadjusted baseline characteristics of each group. SA

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patients were younger in age and more likely to be male, have diabetes and hypertension but less likely to have a previous myocardial infarction, congestive heart failure, smoke or have other co-morbidities. At cardiac catheterization, SA patients were more likely to have higher risk coronary anatomy.

Thirty-day and 1 year unadjusted mortality did not differ between SA patients and Europeans with ACS (2.6% vs.2.4%, p=0.32; 5.0% vs. 5.0%, p=0.92). At one year, repeat angiography (a possible surrogate for recurrent angina) did not differ between both groups (9.9% vs. 9.0%, p=0.18), however repeat revascularization was significantly higher in the SA patient cohort (10.4% vs. 7.6%, p<0.01). Kaplan-Meier survival analysis demonstrated SA ethnicity was associated with improved long-term survival (hazard ratio [HR] 0.71, 95% confidence interval [CI 0.62-0.82]) (Figure 1).

Table 1 also shows the adjusted baseline characteristics of the two groups. Propensity adjustment yielded excellent balance between the SA and European patient groups as the standardized difference was well below the recommended maximum value of 10% for every risk factor.[12] Adjusted 30-day and 1-year mortality were similar between SA and European patients with ACS (2.6% vs. 2.7%, p=0.93; 5.0% vs. 4.8%, p=0.75). Repeat angiography did not differ (9.9% vs. 9.2%, p=0.35) yet repeat revascularization within 1 year was higher in SA patients (9.8% vs. 7.6%, p<0.01). As seen in Figure 2, SA ethnicity was associated with improved long-term survival for propensity matched ACS patients (median 64 months, interquartile range [IQR] 66 months]) (HR 0.82, 95% CI 0.71-0.95).

Baseline characteristics for propensity matched patients receiving medical therapy (568 SA patients matched to 1919 European Canadians), CABG (252 SA patients matched to 737

European Canadians), or PCI (1003 SA patients matched to 2813 European Canadians) can be found in the supplementary index. For all three groups of therapy, propensity adjustment yielded excellent balance between the SA and European patient groups.[15] As shown in table 2, thirty-day and 1-year mortality did not differ between SA and European patients with ACS receiving medical therapy, CABG or PCI. Long-term propensity matched survival according to treatment strategy is outlined in Figure 3. No difference in long-term outcome was noted in SA patients compared to Europeans with ACS treated medically (HR 0.97, 95% CI 0.77-1.22) (Figure 3A). However, there was a trend towards improved survival in SA patients treated with CABG (HR 0.75, 95% CI 0.52-1.08) (Figure 3B) and significant improvement in survival with PCI (HR 0.75, 95% CI 0.59-0.96) (Figure 3C). However, SA patients treated with PCI had higher rates of repeat revascularization at 1-year compared to European Canadian patients (6.0% vs. 3.6%, respectively, $p<0.01$) (Table 2).

DISCUSSION

Our study, derived from a large comprehensive clinical registry of ACS patients undergoing coronary angiography, provides insight into the clinical outcomes of SA patients compared to European Canadians. We found improved long-term survival in SA patients compared to European Canadians, which seems to be associated with revascularization (CABG or PCI). Despite this, we also noted higher rates of repeat revascularization in SA patients treated with PCI. These observational findings are particularly relevant given the lack of reporting and representation of ethnic minorities in clinical trials.[16]

Our study demonstrates improved long-term survival in SA compared to European Canadians treated with an invasive strategy for ACS. Interestingly, The Reduction of Atherothrombosis for

Continued Health (REACH) global registry, which evaluated over 49,000 stable out-patients in 44 countries, found significantly lower cardiovascular death rates in all Asian sub-groups including South Asians. [17] Overall, our findings of improved long-term survival are novel and have particular relevance given the increased prevalence of ACS in SA patients worldwide.[18] Moreover, we found long-term benefits in SA patients with ACS undergoing invasive investigation and subsequent revascularization compared with European Canadians. This is consistent with literature demonstrating improved survival with an invasive strategy involving coronary angiography and revascularization in ACS patients considered to be high-risk.[19] Certainly, SA patients have been previously considered a high-risk patient population given the greater incidence and burden of coronary disease with adverse clinical outcome.[1,20] Our cohort of SA patients had higher rates of diabetes and more severe coronary anatomy than their European counterparts. It is also conceivable that SA ethnicity itself should be considered a separate marker of risk that would support aggressive revascularization to improve long-term survival. Although these results are biologically plausible, we should consider our findings 'hypothesis generating' and should provoke further ethnic-based research.

Worthy of mention are the particular improvements in long-term survival in SA patients who are treated with PCI following ACS. Given the balance in co-morbidities in our propensity-matched analysis, the explanation for the improved outcomes noted in our SA patient cohort is unclear. Perhaps compliance with intensified medical treatment with effective secondary prevention agents may be particularly relevant in this population. SA patients have a heightened awareness and appreciation of their disease burden following a major clinical intervention (such as PCI or CABG) prompting enhanced family support and compliance with therapy. [21,22] This

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may facilitate continued exposure to primary care physicians and cardiologists resulting in improved long-term survival.[23]

Although this less invasive approach may be a particularly attractive for revascularization in SA patients with less complex disease,[24] we did report an increased rate of repeat revascularization in SA patients treated with PCI. This finding has been previously reported by other investigators[25,26]. In our study, rates of repeat coronary angiography were similar between SA and European Canadians regardless of treatment; hence a SA selection bias towards higher rates of repeat coronary angiography in SA is less likely to account for the higher rates of repeat revascularization. Likely this is attributed to higher restenosis rates, given that SA patients have smaller coronary arteries[27] with a greater disease burden and rapid progression of CAD. These observations are congruent with prior published data regarding altered quality of life with recurrent symptoms in SA patients with CAD.[28] Still, this does not seem to alter long-term survival. Additionally, this may be less of an issue in the current era given the superior efficacy of second-generation drug-eluting stents.[29]

Similarly, the rationale for enhanced long-term survival from PCI could also explain the trend towards improved long-term outcomes in SA patients treated with CABG. We do note our results were not statistically significant, however, the adjusted survival analysis is highly suggestive given the limited number of patients. To our knowledge this is the first study to report ethnic-based long-term survival with CABG, which typically is seen 5-10-years following revascularization. [30] Perhaps a higher rate of anatomical complete revascularization in CABG was achieved in SA patients given the greater burden of disease. Although speculative, this warrants further exploration.

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Our study does have limitations. Our categorization method of using name recognition software leaves open the possibility that subjects could be designated to the incorrect ethnicity cohort because of interracial marriage or religious conversion/name change. A small number of subjects will have mixed ethnicity and will not be accurately defined. Our propensity-matched analysis was exhaustive but may not account for unmeasured confounders between SA and European Canadian patients. Our main comparison was SA versus European Canadians with ACS receiving an invasive strategy. Both long-term unadjusted and adjusted survival favored SA subjects. Our findings of improved survival with revascularization in SA compared to European Canadians helps highlight the subgroup with survival benefit which we believe is provocative but should be considered exploratory. We could not account for the temporal evolution of therapies in ACS (i.e. pharmacotherapies, drug-eluting stents, etc). As well, we could not account for the decisions for revascularization (PCI or CABG) or repeat angiography. Still, this represents 'real world' data where variability in decisions for invasive management exist. We suggest repeat angiography following revascularization is a 'possible' surrogate for recurrent angina. However, we do recognize repeat angiography could be performed for other clinical indications. Our findings apply to the North American (Canadian) SA migrant population and may not be generalizable to SAs residing in the Indian subcontinent. Finally, our study may be somewhat limited by a relatively small sample of SA patients.

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Conflict of interest: None

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Figure Legend

Figure 1: Unadjusted long-term survival in European and South Asian patients admitted with ACS

Figure 2: Long-term survival for propensity matched European and South Asian patients admitted with ACS

Figure 3: Long-term survival for propensity matched European and South Asian patients according to treatment strategy: (A) medical therapy; (B) CABG; (C) PCI

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Table 1 - Baseline Characteristics For Unmatched and Propensity Matched Acute Coronary Syndrome Patients

Characteristics	Unmatched ACS Patients			3:1 Propensity Matched ACS Patients		
	European Canadian (n=60791)	South Asian (n=1825)	p-value	European Canadian (n=5469)	South Asian (n=1823)	p-value
Age (years)	62.6	60.4	<0.01	60.2	60.4	0.63
Female	29.4%	24.9%	<0.01	25.5%	25.0%	0.65
Chronic Obstructive Pulmonary Disease	14.2%	8.7%	<0.01	8.6%	8.7%	0.89
Cerebrovascular Disease	6.4%	4.9%	0.01	5.0%	4.9%	0.80
Renal disease	4.3%	4.0%	0.60	3.9%	4.0%	0.83
Congestive Heart Failure	12.3%	10.7%	0.05	11.3%	10.8%	0.49
Diabetes Mellitus	21.9%	35.9%	<0.01	35.9%	35.8%	0.92
Dialysis	1.2%	1.6%	0.09	1.6%	1.6%	0.96
Hypertension	62.5%	65.5%	0.01	64.3%	65.5%	0.37
Dyslipidemia	69.2%	70.8%	0.16	70.1%	70.8%	0.61
Gastrointestinal/Liver Disease	7.2%	6.2%	0.09	6.5%	6.2%	0.68
Malignancy	3.8%	2.2%	0.01	2.5%	2.2%	0.57
Current smoking	34.2%	19.3%	<0.01	19.2%	19.3%	0.95
Previous smoking	34.7%	15.8%	<0.01	16.2%	15.8%	0.67
Previous Myocardial Infarction	33.0%	30.4%	0.02	31.4%	30.4%	0.44
Previous Percutaneous Coronary Intervention	5.5%	5.6%	0.81	5.9%	5.6%	0.62
Previous Coronary Artery Bypass Surgery	3.6%	3.5%	0.89	3.4%	3.5%	0.92
Lytic	8.5%	7.1%	0.04	7.1%	7.1%	0.94
Peripheral Vascular Disease	7.6%	5.1%	<0.01	5.0%	5.1%	0.90
Coronary Anatomy						
Normal	7.9%	5.3%		8.6%	5.3%	

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<50% narrowing	9.2%	8.1%		8.1%	8.1%	
Low risk (Duke 1-6)	45.4%	41.9%	<0.01	44.0%	42.0%	<0.01
High risk (Duke 7-11)	29.8%	38.5%		30.8%	38.6%	
Left Main Disease	7.1%	5.5%		7.4%	5.5%	
Missing	0.5%	0.6%		1.0%	0.5%	
Ejection Fraction (%)						
>50	52.2%	49.3%		50.3%	49.4%	
35-50	19.7%	18.7%		19.4%	18.7%	
20-34	4.5%	3.8%	<0.01	4.2%	3.8%	0.34
<20	7.9%	10.5%		8.9%	10.5%	
Too unstable	8.3%	8.9%		8.2%	8.9%	
Missing	7.5%	8.8%		9.0%	8.8%	

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Table 2 - Clinical outcomes in propensity matched groups stratified by treatment group

	Medical Therapy			CABG			PCI		
Outcome	SA	EC	p value	SA	EC	p value	SA	EC	p value
30 day mortality	3.3%	3.1%	0.78	1.6%	2.3%	0.62	2.4%	2.5%	1.00
One year mortality	7.4%	5.8%	0.16	6.7%	5.3%	0.43	3.2%	4.0%	0.29
1 year repeat angiogram	16.4%	13.1%	0.05	17.5%	18.7%	0.71	27.1%	25.8%	0.43
1 year repeat revascularization	6.5%	4.7%	0.10	4.8%	5.6%	0.75	6.0%	3.6%	<0.01

CABG: Coronary Artery Bypass Graft
EC: European Canadian
PCI: Percutaneous Coronary Intervention
SA: South Asian

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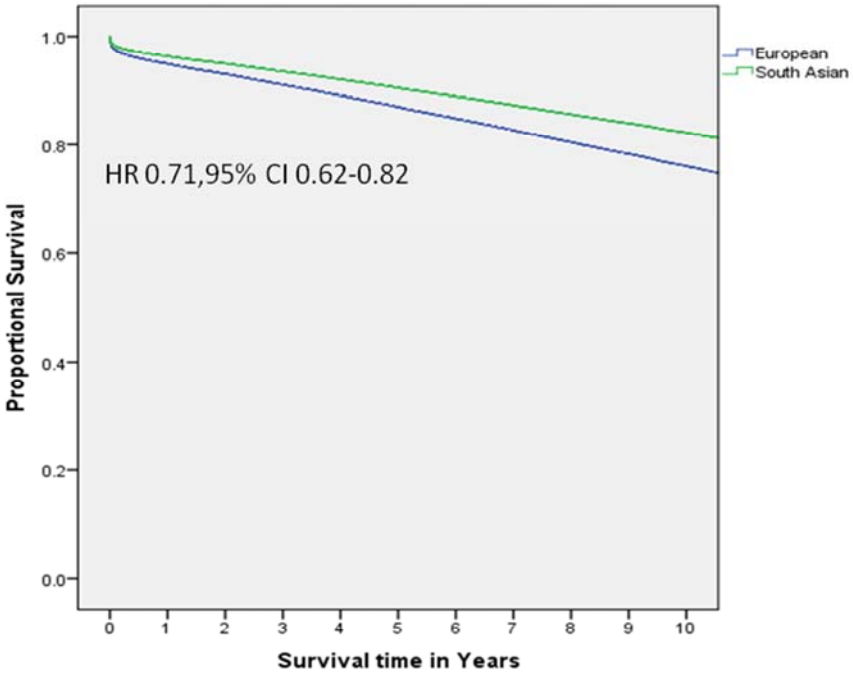

Figure 1

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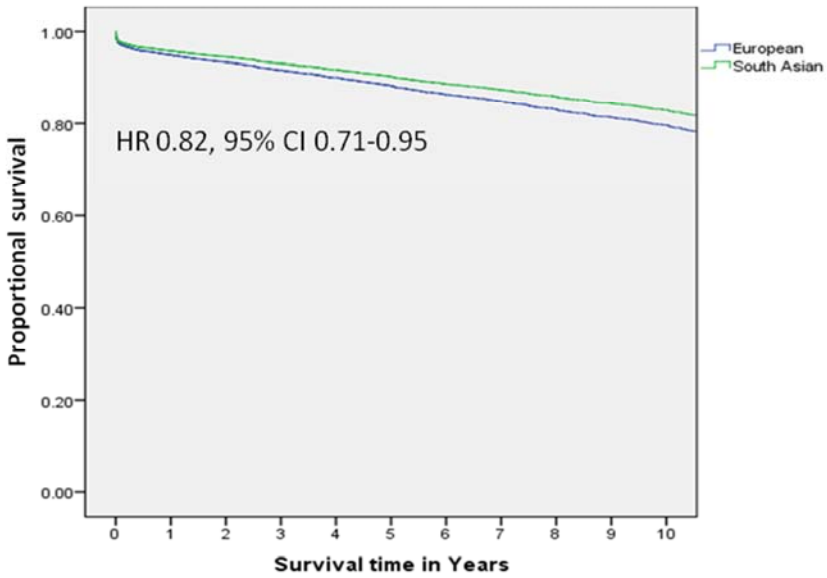

Figure 2

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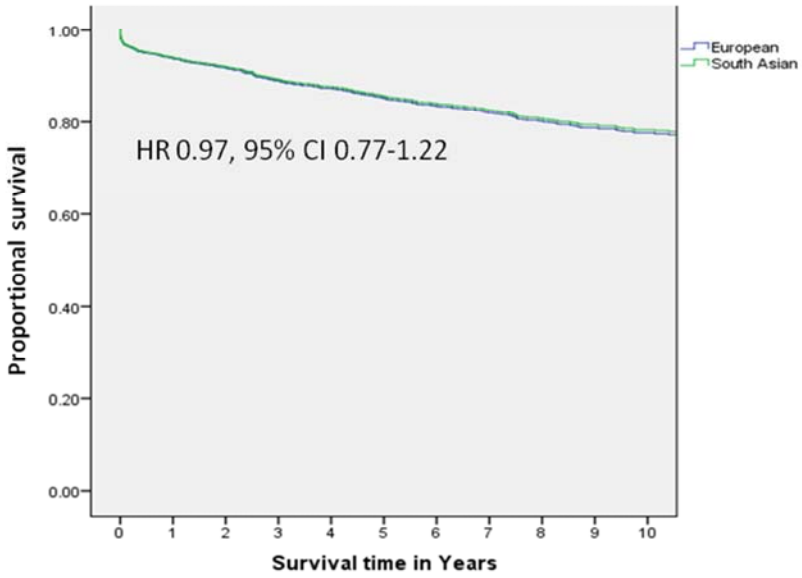

Ethnicity	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
SA	567	508	453	395	345	309	249	207	172	139	91
EU	1918	1753	1571	1392	1245	1074	875	765	618	486	345

Figure 3A

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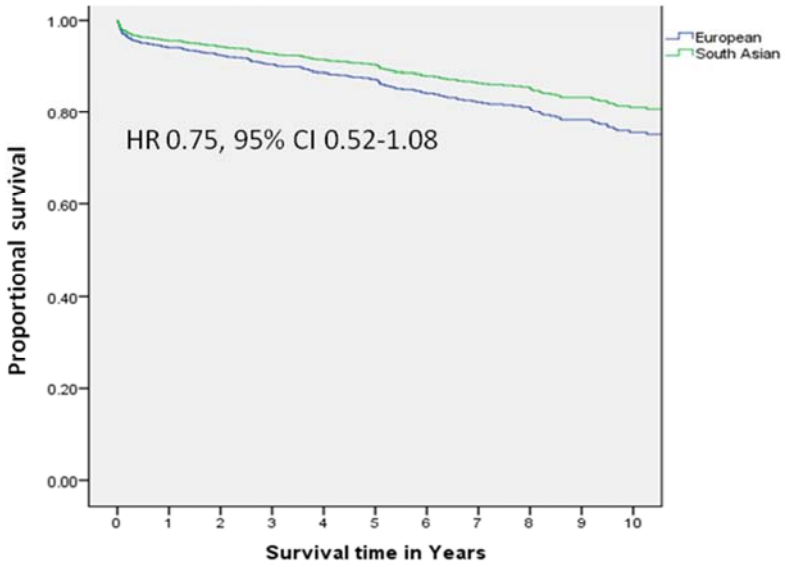

Ethnicity	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
SA	252	228	210	195	172	147	127	114	92	75	53
EU	737	678	628	576	520	462	378	316	260	204	148

Figure 3B

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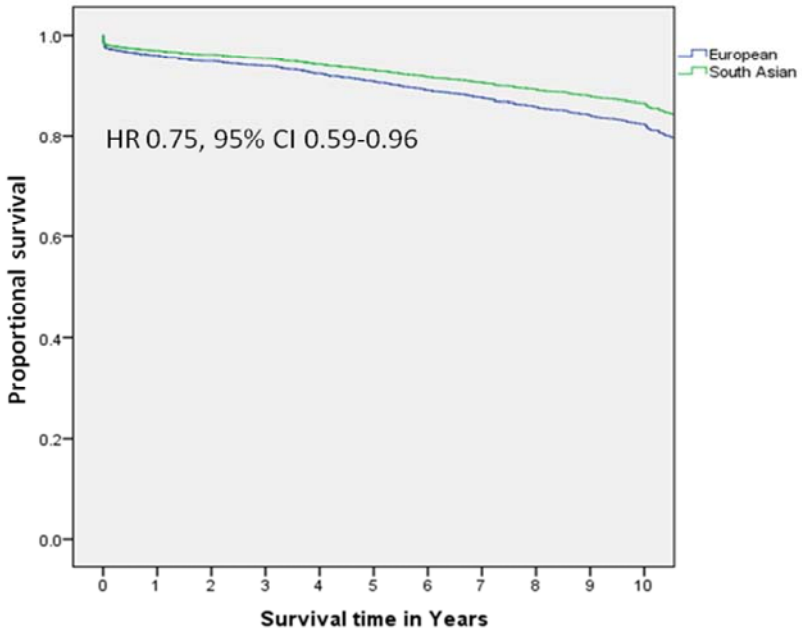

Ethnicity	Baseline	Year 1	Year 2	Year	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
SA	1003	923	798	706	600	510	433	364	285	223	145
EU	2813	2591	2292	1999	1752	1483	1274	1072	806	616	428

Figure 3C

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Appendix 1 - Baseline Characteristics Of Acute Coronary Syndrome Patients Undergoing Medical Therapy According To Ethnicity After a 3:1 Propensity Matched Technique

Characteristics	European Canadian N = 1919	South Asian N = 568	p-value
Age (years)			
Female (%)	36.0	38.9	0.22
COPD (%)	11.2	11.8	0.71
CVD (%)	6.5	5.3	0.33
Renal disease (%)	5.2	6.0	0.46
CHF (%)	14.6	15.0	0.84
Any Diabetes	34.8	34.7	1.00
Dialysis (%)	2.3	2.8	0.54
HTN (%)	63.9	71.1	<0.01
Dyslipidemia (%)	65.8	67.4	0.48
GI/Liver Disease (%)	7.6	8.6	0.42
Malignancy	2.9	3.2	0.78
Current smoking (%)	15.2	12.9	0.18
Previous smoking (%)	17.6	14.4	0.09
Previous MI (%)	27.8	28.0	0.96
Previous PCI (%)	5.2	6.3	0.3
Previous CABG (%)	4.6	6.7	0.05
Lytic (%)	4.1	1.9	0.01
PVD (%)	5.3	6.0	0.53
Coronary Anatomy (%)			<0.01
Normal	24.1	16.9	
<50% lesion	22.9	25.9	
Low risk (Duke 1-6)	31.1	28.0	
High risk (Duke 7-11)	16.1	23.6	
Left Main Disease	4.5	4.9	
Missing	1.4	0.7	
Ejection Fraction (%)			0.97
>50%	58.7	58.8	
35-50%	13.8	13.4	
20-34%	4.2	3.5	
<20%	8.1	8.6	
Too unstable	6.6	6.5	
Missing	8.5	9.2	

COPD: Chronic Obstructive Pulmonary Disease
CVD: Cerebrovascular Disease
DM: Diabetes Mellitus
HTN: Hypertension
MI: Myocardial Infarction
PCI: Percutaneous Coronary Intervention
CABG: Coronary Artery Bypass Graft

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Appendix 2 - Baseline Characteristics Acute Coronary Syndrome Patients Undergoing CABG According To Ethnicity After a a 3:1 Propensity Matched Technique

Characteristics	European Canadian N =737	South Asian N = 252	p-value
Age (years)			
Female (%)	20.3	21.4	0.72
COPD (%)	91.3	90.1	0.61
CVD (%)	6.2	9.1	0.15
Renal disease (%)	5.6	3.2	0.18
CHF (%)	15.5	12.3	0.26
Any Diabetes	47.8	44.4	0.38
Dialysis (%)	1.9	0.4	0.13
HTN (%)	74.9	74.2	0.87
Dyslipidemia (%)	80.7	83.3	0.4
GI/Liver Disease (%)	6.1	7.5	0.46
Malignancy	2.4	3.2	0.5
Current smoking (%)	17.8	15.1	0.38
Previous smoking (%)	18.2	18.3	1
Previous MI (%)	39.3	37.3	0.6
Previous PCI (%)	8.3	4.8	0.07
Previous CABG (%)	1.6	2.4	0.42
Lytic (%)	5.7	7.1	0.45
PVD (%)	6.4	5.2	0.55
Coronary Anatomy (%)			0.27
Normal	0.1	0.0	
<50% lesion	0.1	0.4	
Low risk (Duke 1-6)	8.1	7.9	
High risk (Duke 7-11)	49.2	66.7	
Left Main Disease	31.3	24.2	
Missing	1.1	0.8	
Ejection Fraction (%)			0.03
>50%	45.2	50.0	
35-50%	24.0	26.6	
20-34%	7.3	3.2	
<20%	6.5	7.5	
Too unstable	7.9	8.3	
Missing	9.1	4.4	

COPD: Chronic Obstructive Pulmonary Disease
CVD: Cerebrovascular Disease
DM: Diabetes Mellitus
HTN: Hypertension
MI: Myocardial Infarction
PCI: Percutaneous Coronary Intervention
CABG: Coronary Artery Bypass Graft

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Appendix 3 - Baseline Characteristics Acute Coronary Syndrome Patients Undergoing PCI According To Ethnicity After a 3:1 Propensity Matched Technique

Characteristics	European Canadian N = 2813	South Asian N = 1003	p-value
Age (years)			
Female (%)	19.7	17.9	0.23
COPD (%)	6.7	6.6	0.94
CVD (%)	3.7	3.6	0.92
Renal disease (%)	2.6	3.1	0.43
CHF (%)	8.0	8.0	1
Any Diabetes	33.6	34.3	0.7
Dialysis (%)	1.0	1.2	0.58
HTN (%)	61.9	60.1	0.35
Dyslipidemia (%)	70.3	69.5	0.66
GI/Liver Disease (%)	5.8	4.5	0.12
Malignancy	2.2	1.5	0.19
Current smoking (%)	22.4	24.0	0.29
Previous smoking (%)	14.8	16.0	0.38
Previous MI (%)	31.7	30.0	0.34
Previous PCI (%)	5.8	5.4	0.69
Previous CABG (%)	3.2	2.0	0.06
Lytic (%)	9.5	10.1	0.58
PVD (%)	4.5	4.6	0.93
Coronary Anatomy (%)			0.56
Normal	0.2	0.1	
<50% lesion	0.2	0.0	
Low risk (Duke 1-6)	62.2	58.4	
High risk (Duke 7-11)	33.4	40.0	
Left Main Disease	3.2	1.1	
Missing	0.8	0.4	
Ejection Fraction (%)			0.15
>50%	46.0	43.9	
35-50%	22.0	19.7	
20-34%	3.3	4.1	
<20%	10.1	12.3	
Too unstable	9.3	10.4	
Missing	9.3	9.6	

COPD: Chronic Obstructive Pulmonary Disease
CVD: Cerebrovascular Disease
DM: Diabetes Mellitus
HTN: Hypertension
MI: Myocardial Infarction
PCI: Percutaneous Coronary Intervention
CABG: Coronary Artery Bypass Graft