Epidemiology, risk analysis and clinical outcomes of acute myocardial infarction in Trinidad

Trinidad'da akut miyokart enfarktüsünün epidemiyolojisi, risk analizi ve klinik sonuçları

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Cardiovascular (CVS) disease is a global phenomenon and in Trinidad and Tobago, a small island developing country, remains the leading cause of death since the 1940's. It accounts for a proportional mortality of 25%.The main contributors are ischemic heart disease and stroke (1). Because CVS disease has global implications, the evaluation of the diverse outcomes of acute myocardial infarction (AMI) using population based hospital discharge databases is an important activity. The aim of this study is to describe the epidemiological features of acute myocardial infarction (AMI) and outcomes in patients admitted for tertiary care in Trinidad.

We used a prospective follow- up design using consecutive cases of AMI. We adopted the universal definition of myocardial infarction by Thygesen et al. (2). Demographic data, clinical management and survival data were collected prospectively. Clinical data included the presence of comorbid conditions (diabetes, hypertension and the metabolic syndrome), alcohol consumption, smoking and body mass index (BMI). All statistical analyses were conducted using SPSS vs 16 (Chicago: USA, SPSS Inc.). We examined the relationship between outcome (survival vs death) and several predictor variables using logistic regression analysis. Results are presented as odds ratios and 95% confidence intervals. The primary end-points are survival to discharge and 30-day mortality.

Overall, 266 patients met the criteria for entry; there were 143 (53.8%) men and 123 (46.2%) women. The proportion of women who experienced an AMI before age 51 was 17.1% as compared to 25.9% in men, indicating that the occurrence of AMI was more common among men than women in this age group. In the age group 51-55 years the proportion was similar (women=93, 75.2%, men=105, 74.4%), however in the age group >55 years more women suffered an AMI then men (women =79, 64.2%) vs. men=71, 49.7%, p=0.016) indicating a higher vulnerability.

The 30-day mortality was 9.02%, age adjusted mortality was not calculated due to the small numbers. The case fatality rates were 10.4% (15/143) in men and 7.3% (9/123) in women but was not statistically significant (p=0.36). Trinidad consists of two major diasporas, South East Asians and Africans both representing 40% of the population of 1.3 million. The occurrence of AMI was higher in South East Asians (n=129, 48.5%), than Africans (n=110, 41.4%). The majority of patients 105 (42.5%) had a normal BMI (18.5-24.9 kg/m²), 62 (25.1%) patients were overweight (BMI 25-29.9 kg/m²) and only 31(12.6%) patients were obese (BMI $\geq$ 30 kg/m²). 77 (28.9%) patients were current smokers while 189 (71.1%) were non-smokers or past smokers, (85, 32%) drank alcohol of which 44.7% were heavy drinkers and 16.5% were moderate drinkers.

Hypertension was the most common comorbid condition (52, 19.6%), diabetes occurred in 36 (13.5%) patients and 115 (43.2%) had both hypertension and diabetes. In addition, 37% of patients satisfied the WHO criteria for the metabolic syndrome (3). Left-sided or central chest pain (n=242, 91%) and shortness of breaths (n=79, 29.7%) were the two most common presenting symptoms. The predominant electrocardiographic pattern was ST segment elevation (71.4%, n=189) while non-ST-segment elevation myocardial infarction occurred in 52 (19.5%) patients.

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Using multiple logistic regression modeling smoking and BMI (≥30 kg/m²) emerged as predictors of death or survival. Smoking was associated with 1.6 increased risk of AMI (OR= 1.586, CI 1.21-2.23) and BMI 1.3 (OR 1.28, CI 1.1- 2.01). A pulse rate in the range 50-100 (beats/min) was a protective factor (OR = 0 .353, CI 0.26-0.75) (Table 1).

We report a case fatality rate of 9%. This rate is equivalent to that reported by Kuch et al. (4) (10.8%) in the MONICA project, emphasizing the similarity of impact of AMI on small developing countries. Hypertension (52, 19.6%), type 2 diabetes (36, 13.5%), the combination of hypertension and type 2 DM (115, 43.2%) and the metabolic syndrome (37%) were the major comorbid factors associated with AMI. The implication of these findings stresses the importance of tighter BP and glycemic control and prevention. Dyslipidemia was also common, 145 (54.5%) patients had a HDL value of <50 mg/dL, 246 (92.5%) patients had a LDL value of >100 mg/dL, 189 (71.1%) patients had a total cholesterol value of >200 mg/dL and 197 (74.1%) patients had a triglyceride value of >150 mg/dL.

The majority of patients (42.5%) had a normal BMI providing support that BMI may not be a major risk factor in AMI. In a meta-analysis consisting of over 250.000 patients, Romero-Corral et al. (5) concluded that BMI is not a significant clinical and epidemiological measure of cardiovascular risk for both primary and secondary prevention. A third of patients (85, 32%) drank alcohol. The WHO Global Burden of Disease Study suggests that alcohol is the third most important risk factor, after smoking and elevated BP, for European ill-health and premature death. A quarter of our patients (68, 25.6%) were current smokers, indicating high smoking rates and the need for effective smoking cessation interventions. Teo et al. (7) reported in the INTERHEART study, that tobacco use is one of the major avoidable causes of cardiovascular diseases.

In conclusion, this is the first study of its kind in Trinidad that provides both epidemiological evidence of the risk factors associated with AMI and outcomes.

Conflict of interests: None declared.

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Table 1. Odds ratio for variables predicting death or survival in patients experiencing an AMI

Variables	Odds Ratio	95% CI	p
Smoking	1.6	1.21-2.23	0.043
BMI	1.3	1.28-2.01	0.020
Pulse rate	0.35	0.26-0.75	0.001
AMI - acute myocardial infarction, BMI - body mass index			