

**THE ROLE OF BETEL QUID CHEWING IN RISK
OF ACUTE MYOCARDIAL INFARCTION
IN MYANMAR**

KO KO ZAW

**M.B.,B.S, M.P.H.
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UNIVERSITY OF PUBLIC HEALTH
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ABSTRACT

Cardiovascular diseases (CVD) is the leading cause of death worldwide and they account for nearly 30 percent of all deaths in low and middle income countries. Effective CVD prevention in a country requires an understanding of the importance of known and putative CVD risk factors in the particular population. In the recent years, non-conventional risk factors or markers such as areca nut chewing, and Apolipoprotein A have been proposed for acute myocardial infarction, a major CVD. Among them, betel quid chewing is particularly relevant to Asian countries like Myanmar where this practice is quite prevalent. The concept of conventional risk factors associated with acute myocardial infarction (AMI) was derived from prospective epidemiologic studies conducted mainly in Western populations. The relative importance of risk factors for AMI may vary from country to country. Therefore this study aims to determine the independent association of betel quid chewing and the risk of acute myocardial infarction and to assess the strength of association between conventional risk factors and acute myocardial infarction using a sex and age-matched case control study design. The study was conducted at Department of Cardiology, Yangon General Hospital from January 2016 to October 2016. Patients who were admitted the Department of Cardiology and diagnosed as AMI by physicians in this Department was recruited as cases. One age-matched (up to 5 years older or younger) and sex-matched and unrelated (not first-degree relative) visitor of a cardiac patient was recruited as a control within 2 weeks of each case until the required sample size of controls is obtained. One hundred and fifty cases and one hundred and fifty controls were recruited. Interview using pretested structured questionnaires, physical examinations and random blood tests by dry chemistry was performed in the same manner in cases and controls. Information was collected on background characteristics, lifestyles, history of hypertension and diabetes mellitus, height, weight, blood pressure, random blood glucose and random blood cholesterol. In data analysis, cases and controls were compared on socioeconomic variables, primary exposure and potential confounders for assessing comparability of their distributions. Crude odds ratios (OR) was calculated between betel quid chewing and other risk factors and presence of acute myocardial infarction separately and 95% confidence interval (95%CI) of OR, χ^2 test value and p value. For multivariable analysis, three models of binary logistic regression was fitted for screening for choice of a final best fitting model. The model with the lowest Akaike Information Criterion and

Bayesian Information Criterion) was chosen as the final model. Statistical analyses were performed with STATA version 14. All statistical tests of hypotheses were two-sided. The statistically significant level for p value was set at 0.05 except for inclusion in the multivariable analysis where significant level for p was 0.10. Age and sex distribution in cases and controls were similar because age and sex matching was used. Marital status was similarly distributed among cases and controls. Controls were a little more educated and higher in household incomes. Betel quid habits and alcohol drinking habits were similarly distributed among cases and controls. Smoking was higher in cases than controls. Level of high consumption of fruit and vegetable intake, obesity and high total cholesterol was higher in controls than cases. Level of meat, fried foods and salty foods consumption, frequent psychological stress, hypertension and diabetes was higher in cases than controls. For the risk of AMI, unadjusted OR was 1.01 (95%CI=0.42, 2.44, $p=0.98$) for former chewers and 1.04 (95%CI=0.63, 1.72, $p =0.88$) for current chewers. At binary multiple logistic regression, adjusted OR (95%CI) were 1.34 (0.48, 3.71) for former chewing and 0.68(0.34,1.34) for current chewing ; 3.22 (1.26, 8.23) for former smoking and 8.07 (3.77, 17.3) for current smoking; 0.48 (0.20, 1.16) for former drinking and 0.73 (0.32,1.67) for current drinking; 0.42 (0.23, 0.77) for regular exercise; 0.71 (0.33, 1.53) for fruit and vegetable 1-2 servings per day, 0.27 (0.13, 0.57) for fruit and vegetable 3-4 servings per day and 0.33 (0.11, 1.05) for fruit and vegetable 5+ servings per day; 3.95 (1.26,12.36) for deep fried food consumption; 1.30 (0.36,4.63) for salty food 1 time per day, 2.35 (1.28, 4.31) for 2-3 times per day; 0.97 (0.51, 1.82) for some periods of general stress, 2.32 (0.99, 5.46) for several periods or permanent stress; and 3.47 (1.64, 7.33) for diabetes. It can concluded that betel quid chewing is not an important risk factor of AMI in the adult study population of Yangon and surrounding areas but control of betel quid chewing remains a priority health intervention in Myanmar because it is an established risk factor for oral cancer. The study highlighted that the most important and potent risk factors of AMI were smoking, consumption of deep-fried foods and diabetes in order of strength of association and psychological stress also played an important role in development of AMI. The study revealed that the strongly protective factors of AMI were regular exercise and daily high consumption fruit and vegetable in the adult population. High priority should be given to control of smoking and diabetes to curb the disease burden of AMI in Myanmar. Communities and families should be educated to adopt regular exercise and healthy

diets, especially, avoiding consumption of deep fried foods and salty foods and high consumption of fruit and vegetable. Stress management and mental health should be an essential component of prevention and control of cardiovascular diseases. Strengths of association of important risk factors from the study can be used, together with data on prevalence of these risk factors in Myanmar to estimate population attributable risk of acute myocardial infarction.