Journal of Public Health and Development
Vol. 11 No. 3 September - December 2013

ORIGINAL ARTICLE

Association between Consumption of Social Drug and Coronary Artery Disease among Patients at Kasemrad Prachachuen Hospital, Bangkok

Maneerat Rongthong[1], Doungjai Buntup[2] and Jiraporn Chompikul[3]

[1] *M.A. (Addictionology), ASEAN Institute for Health Development, Mahidol University Siriraj Piyamaharajkarun Hospital, Faculty of Medicine Siriraj Hospital, Mahidol University*
[2] *Ph.D. (Neuroscience), ASEAN Institute for Health Development, Mahidol University*
[3] *Ph.D. (Biostatistics), ASEAN Institute for Health Development, Mahidol University*

Corresponding author: *Doungjai Buntup* ***Email:*** *grdoungjai@mahidol.ac.th*
Received: *27 December 2012* ***Revised:*** *30 August 2013* ***Accepted:*** *30 August 2013*
Available online: *December 2013*

Abstract

Rongthong M, Buntup D and Chompikul J
Association between Consumption of Social Drug and Coronary Artery Disease among Patients at Kasemrad Prachachuen Hospital, Bangkok.
J Pub Health Dev. 2013; 11(3): 3-12

Coronary artery disease (CAD) is the cause of one in three deaths among Thais. This unmatched case-control study aimed to determine the association between social drug consumption and CAD. The cases were 140 patients who were undergoing percutaneous coronary intervention and 140 controls selected from the OPD and other suitable wards. Data were collected using a structured questionnaire. Chi-square tests and multiple logistic regression were used to identify variables related to CAD.

The results showed that 11 variables were significantly associated with CAD: age, education, body mass index (BMI), diabetes, hypertension, hyperlipidemia, a family history of CAD, high fat consumption, lack of physical activity, smoking and consumption of energy drinks. Smoking showed a higher risk of CAD (OR = 3.20, 95% CI = 1.65-6.20) than alcohol (OR = 0.36, 95% CI = 0.18-0.72) when adjusted for other factors. This study concluded that CAD is associated with smoking. We suggest that patients should be provided with knowledge about the use of social drugs and the harmful effects of drug-dependent behavior.

Keywords: social drugs consumption, coronary artery disease, risk factors

วารสารสาธารณสุขและการพัฒนา
ปีที่ 11 ฉบับที่ 3 กันยายน - ธันวาคม 2556

ความสัมพันธ์ระหว่างการบริโภคสิ่งเสพติดที่ใช้เพื่อการเข้าสังคมและโรคหลอดเลือดหัวใจในผู้ป่วยที่โรงพยาบาลเกษมราษฎร์ ประชาชื่น กรุงเทพมหานคร

มณีรัตน์ รองทอง[1] ดวงใจ บรรทัพ[2] และจิราพร ชมพิกุล[3]

[1] *ศิลปศาสตรมหาบัณฑิต (วิทยาการเสพติด) สถาบันพัฒนาสุขภาพอาเซียน มหาวิทยาลัยมหิดล*
โรงพยาบาลศิริราชปิยมหาราชการุณย์ คณะแพทยศาสตร์ศิริราชพยาบาล มหาวิทยาลัยมหิดล
[2] *ดุษฎีบัณฑิต (ประสาทวิทยา) สถาบันพัฒนาสุขภาพอาเซียน มหาวิทยาลัยมหิดล*
[3] *ดุษฎีบัณฑิต (ชีวสถิติ) สถาบันพัฒนาสุขภาพอาเซียน มหาวิทยาลัยมหิดล*

บทคัดย่อ

มณีรัตน์ รองทอง ดวงใจ บรรทัพ และจิราพร ชมพิกุล
ความสัมพันธ์ระหว่างการบริโภคสิ่งเสพติดที่ใช้เพื่อการเข้าสังคมและโรคหลอดเลือดหัวใจในผู้ป่วยที่โรงพยาบาลเกษมราษฎร์ ประชาชื่น กรุงเทพมหานคร
ว.สาธารณสุขและการพัฒนา. 2556; 11(3): 3-12

โรคหลอดเลือดหัวใจเป็นสาเหตุการเสียชีวิตอันดับ 1 ใน 3 ของประชากรไทย การวิจัยแบบการศึกษาย้อนหลังแบบไม่จับคู่นี้ มีวัตถุประสงค์เพื่อประเมินความสัมพันธ์ระหว่างการบริโภคสิ่งเสพติดที่ใช้เพื่อการเข้าสังคม (บุหรี่ แอลกอฮอล์ และคาเฟอีน) และโรคหลอดเลือดหัวใจ ใช้กลุ่มศึกษาจำนวน 140 คน ซึ่งเป็นผู้ป่วยโรคหลอดเลือดหัวใจที่เข้ารับการรักษาทำหัตถการใส่ขดลวดขยายหลอดเลือดหัวใจ และกลุ่มควบคุม 140 คน โดยคัดเลือกจากแผนกผู้ป่วยนอกและหอผู้ป่วยอื่นๆ เก็บข้อมูลโดยใช้แบบสอบถาม สถิติที่ใช้เพื่อการทดสอบปัจจัยที่มีความสัมพันธ์ต่อโรคหลอดเลือดหัวใจ ได้แก่ ไคสแควร์และการถดถอยโลจิสติกพหุคูณ

ผลการศึกษาเบื้องต้นพบว่า มีปัจจัย 11 ปัจจัยที่มีความสัมพันธ์ต่อโรคหลอดเลือดหัวใจ ได้แก่ อายุ การศึกษา ดัชนีมวลกาย โรคเบาหวาน โรคความดันโลหิต โรคไขมันในเส้นเลือด ประวัติครอบครัวที่เจ็บป่วยด้วยโรคหลอดเลือดหัวใจ การบริโภคอาหารไขมันสูง การออกกำลังกาย การสูบบุหรี่ และการบริโภคเครื่องดื่มชูกำลัง เมื่อใช้การถดถอยโลจิสติกพหุคูณในการควบคุมตัวแปรกวน พบว่า บุหรี่เป็นปัจจัยเสี่ยงต่อโรคหลอดเลือดหัวใจ (OR = 3.20, 95% CI = 1.65-6.20) มากกว่าการบริโภคเครื่องดื่มแอลกอฮอล์ (OR = 0.36, 95% CI = 0.18-0.72) ผลการศึกษานี้สรุปว่าการเกิดโรคหลอดเลือดหัวใจมีความสัมพันธ์กับการสูบบุหรี่ ควรมีการให้ความรู้ที่ถูกต้องแก่ผู้ป่วยในการใช้สิ่งเสพติดที่ใช้เพื่อการเข้าสังคมและผลกระทบของพฤติกรรมการเสพติด

คำสำคัญ: การบริโภคสิ่งเสพติดที่ใช้เพื่อการเข้าสังคม โรคหลอดเลือดหัวใจ ปัจจัยเสี่ยง

Introduction

Coronary artery disease (CAD) is the principal cause of death worldwide.[1] A study of the period 2004-2008 revealed that CAD is the cause of death in a third of Thais.[2] The Thai Acute Coronary Syndrome Registry reports that the mortality rate of patients in Thailand is twice that found abroad. The highest incidence is among the 65 - 75 age group and among those aged < 45 years; the major risk factor is smoking cigarettes.[3] Thus, consumption of social drugs presents a risk of CAD. Smokers' risk of developing coronary artery disease is two-to-five times that of nonsmokers.[4-5] The effects due to moderate consumption of alcohol over time is related to coronary artery disease. In addition, users of alcohol exhibit a much higher consumption of tobacco. The odds ratio for CHD among alcohol and cigarette users was 2.9 (95% CI = 1.8-4.0, $p < 0.05$).[6] Heavy coffee consumption increases the short-term risks of acute myocardial infarction or coronary death.[7] For people who consume three-to-four cups of coffee per day, the risk of developing coronary heart disease is 1.33 times that of non-consumers.[8] The effects due to consumption of social drugs is an important consideration for future health management and it is important to make use of, and communicate, knowledge about good health to reduce morbidity and mortality due to CAD. This study was aimed to determine the association between social drug consumption and CAD among in-patients at the Heart Center at Kasemrad Prachachuen Hospital.

Methods

A hospital-based unmatched case-control study was used in this study. The sample size[9] was calculated when the estimated proportion of exposure for cases was 0.7[4] and the estimated proportion of exposure for controls was 0.45.[4]

The cases were selected by purposive sampling; the sample consisted of 140 patients who were undergoing percutaneous coronary intervention and 140 controls selected from the registry unit of in-patients and out-patients at the same time in departments such as surgery, ENT and the eye clinic at Kasemrad Prachachuen Hospital, Bangkok. The questionnaire was divided into three parts. The section on socio-demographic factors consisted of three questions dealing with gender, age and educational level. The section about health information consisted of seven questions which focused on the risk factors for CAD: BMI, diabetes, hypertension, hyperlipidemia, family history of CAD, high fat consumption and lack of physical activity. The section about consumption of social drugs included questions about smoking, and consumption of alcohol and caffeine. Participants were classified into those who had never smoked and those having smoked at least one cigarette per day for one or more years during their lifetime. The number of cigarettes smoked per day was classified as 0, 1-5, 6-10 and over 10 cigarettes smoked per day. Having smokers in families were classified into those with family members who had never smoked and those with family members who had smoked. Alcohol use was defined as consumption of ethyl alcohol (ethanol) produced by fermenting the starch or sugar found in various fruits and grains. This category includes liquor, beer and wine; participants were classified into those who had at least one drink per day for one or more years during their lifetime. Caffeine consumption was classified into coffee consumption, tea consumption

and energy drink consumption. Consumers were those who had at least one drink per day for one or more years during their lifetime. The ethics committee of Mahidol University approved the study protocol.

Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to describe the demographic data. A chi-square test was used and the crude odds ratio and a confidence interval of 95% were also calculated. Multiple logistic regression was used to determine the association between study factors and CAD after adjusting for confounding factors.

Results

Most patients were male (Table 1). Cases were considerably older than controls. The average age and the standard deviation for cases were 57.08 ± 9.32 and those for controls were 52.78 ± 9.36. The educational level of the majority of cases was unschooled or primary school (71.4%), which was higher than that for the control group. The following factors were significantly associated with CAD: BMI, diabetes, hypertension, hyperlipidemia, a family history of CAD, high fat consumption and lack of physical activity, (Table 2).

The Chi-square test demonstrated that all social drug variables have a significant association with CAD: smoking (OR = 2.7; 95% CI = 1.66-4.37), and energy drinks (OR = 1.86; 95% CI = 1.10-3.13) (Table 3).

As reported in Table 4, multivariate analysis showed that smoking is significantly associated with CAD (OR = 3.20, 95% CI = 1.65-6.20). The risk of CAD was nearly two times higher among people consumed social drugs than those who did not use social drugs.

Discussion

This study showed that the association between social drug consumption and CAD among Thai is similar to the association found in several previous studies in Western countries and India.[4, 10-12]

The findings of this study revealed that smoking was found to be significantly associated with a risk of CAD in both the bivariate and multivariate analyses. The severity of risk is associated with the number of cigarettes smoked every day. People who smoke ≥ 10 cigarettes per day have a 4.73 times greater risk of CAD than non-smokers. Moreover, this study showed that patients who have a smoker in the family have a three times higher risk of CAD as compared with those with no smokers in the family. This is similar to the results found in previous studies which have reported that non-smokers exposed to environmental smoke have a one- to twofold greater risk of coronary heart disease as compared with nonsmokers not exposed to smoke.[13-15] In contrast, alcohol consumption was negatively associated with a risk of CAD. Previous studies have shown that light to moderate consumption of alcohol has a protective effect for CAD.[12, 16, 17] The protective effect of alcohol may be due to an increase in HDL cholesterol, the inhibition of platelet aggregation and an increase in fibrinolysis.[18] Other reviews have shown that wine drinkers tend to have a healthier lifestyle profile than those consuming beer and/or liquor.[19-20]

Moreover, the present study explored the relation between caffeine consumption and CAD. Caffeine

is a chemical substance synthesized in a chemical process and is naturally present in many beverages such as coffee, tea and chocolate; it is added to soft drinks, such as Red Bull™ and various colas and it enjoys great popularity.[21] DeSciscio et al. reported that the caffeine and taurine in Red Bull™ have been shown to affect platelet and cardiac function in young subjects. Increased platelet reactivity and endothelial dysfunction are predictors for cardiovascular disease.[22] This study found that consumption of energy drinks is significantly associated with CAD ($p < 0.019$), but no such association was observed between CAD and the consumption of coffee, tea or soft drinks. After adjusting for others factors in the model, no significant association was found between energy drink intake and CAD. Several studies have been controversial because of their diverse conclusions regarding caffeine's effect on CAD.[10, 23, 24]

This study had some limitations. Characteristics of cases and controls should be similar. In this study, the demographic characteristics of cases and controls are different. The researcher adjusted the demographic characteristic variables in the multiple logistic regression. The quantity of alcohol consumed by participants in this study was obtained by asking each participant about his/her past drinking habits; the responses were then converted to provide a constant quantity for drinking behavior. The data obtained may differ from the actual quantity consumed since the data were obtained from self-reports. Therefore, there might be under-reporting of actual alcohol and caffeine consumption. Interaction or effect modification due to synergism of multiple variables was not considered due to the small size of the sample.

In conclusion, this study confirms that the consumption of social drugs, especially smoking, is a significant risk factor in the development of CAD. Patients should be provided with knowledge about the use of social drugs and the harmful effects of drug-dependent behavior, and promotion and preventive programs to reduce risk factors related to CAD should be put in place. The Ministry of Public Health should strengthen a campaign to educate people about the dangers of social drug consumption and should also provide health promotion and preventive program to decrease the risks of social drug consumption associated with CAD. Further studies should be conducted using the mixed methods (quantitative and qualitative research) to obtain more detailed information that could contribute to an in-depth understanding of the context for social drugs and their relationship with coronary artery disease.

Acknowledgements

The authors would like to express their sincere gratitude to the participants, the director and all members of staff at the hospital where this study was conducted for their cooperation during the data collection period.

Table 1 Distribution of respondents by socio-demographic characteristics

Characteristics	n = 280	Case (n = 140) %	Control (n = 140) %	Chi-square p-value
Gender				0.532
Male	181	66.4	62.9	
Female	99	33.6	37.1	
Age (Years)				< 0.001***
≤ 55	154	44.3	65.7	
> 55	126	55.7	34.3	
Mean (SD)		57.1 (9.3)	52.8 (9.4)	
Educational level				< 0.001***
Unschooled and primary school	139	71.4	27.9	
High school 1-6 and diploma	76	22.1	32.1	
Bachelor's degree or higher	65	6.5	40	

**** p-value < 0.001*

Table 2 Association between the risk factors and coronary artery disease

Variables	n = 280	Case (n = 140) %	Control (n = 140) %	Crude OR (95% CI)	Chi-square p-value
BMI					0.001**
< 18.5-24.9	162	47.1	68.6	1.00	
≥ 25	118	52.9	31.4	2.61 (1.46-4.66)	
Mean (SD)		25.46 (3.71)	23.76 (3.31)		
Diabetes					< 0.001***
No	184	63.6	95	1.00	
Yes	56	36.4	5	10.88 (4.72-25.07)	
Hypertention					< 0.001***f
No	180	28.6	0	-	-
Yes	100	71.4	0	-	-
Hyperlypidemia					< 0.001***
No	145	20	83.6	1.00	
Yes	135	80	16.4	20.34 (11.06-37.42)	
Family history of CAD					< 0.001***
No	182	51.4	78.6	1.00	
Yes	65	33.6	12.8	3.99 (2.15-7.41)	
Unknown	33	15	8.6	2.67 (1.24-5.77)	
High fat consumption					0.001**
None	233	75.7	90.7	1	
Yes	47	24.3	9.3	3.13 (1.57-6.24)	
Physical activity					< 0.001***
Exercise	183	37.7	62.2	1.00	
No exercise	97	73.3	26.8	4.52 (2.63-7.74)	

** p-value < 0.05, ** p-value < 0.01, *** p-value < 0.001*

f = Fisher's exact test

Table 3 Association between social drug consumption and CAD

Variables	n = 280	Case (%)	Control (%)	Crude OR (95% CI)	p-value
Smoking					
No	136	36.4	60.7	1	
Yes	144	63.6	39.3	2.70 (1.66-4.37)	< 0.001***
Number of cigarettes smoked per day					
0	136	36.4	60.7	1	
1-5	23	7.9	8.6	1.53 (0.63-3.72)	0.350
6-10	48	17.1	17.1	1.67 (0.89-3.24)	0.131
≥ 10	73	38.6	13.6	4.73 (2.53-8.87)	< 0.001***
With smokers in family					
No	189	55.7	79.3	1	
Yes	91	44.3	20.7	3.04 (1.79-5.16)	< 0.001***
Alcohol consumption					
No	96	37.9	30.7	1	
Yes	184	62.1	69.3	0.73 (0.44-1.19)	0.209
Coffee consumption					
No	99	34.3	36.4	1	
Yes	181	65.7	63.6	1.10 (0.67-1.79)	0.708
Tea consumption					
No	186	61.4	71.4	1	
Yes	94	38.6	28.6	1.57 (0.95-2.59)	0.076
Energy drink consumption					
No	196	63.6	76.4	1	
Yes	84	36.4	23.6	1.86 (1.10-3.13)	0.019*

** p-value < 0.05, ** p-value < 0.01, *** p-value < 0.001*

Table 4 Multiple logistic regression analysis as a predictor of CAD

Variables	Adj. OR	95% CI	p-value
Gender			
Male	1		
Female	0.89	0.45-1.77	0.750
Age			
≤ 55 years	1		
> 55 years	2.50	1.41-4.44	0.002**
BMI			
< 18.5-24.9	1		
≥ 25	2.71	1.53-4.80	0.001**
High fat consumption			
No	1		
Yes	3.44	1.50-7.90	0.004**
Physical activity			
Exercise	1		
No exercise	3.74	2.00-7.00	< 0.001***
Smoking			
No	1		
Yes	3.20	1.65-6.20	0.001**
Alcohol consumption			
No	1		
Yes	0.36	0.18-0.72	0.004**
Coffee consumption			
No	1		
Yes	0.79	0.44-1.43	0.440
Energy drink consumption			
No	1		
Yes	1.43	0.73-2.78	0.292
Tea consumption			
No	1		
Yes	1.25	0.67-2.30	0.484

** p-value < 0.05, ** p-value < 0.01, *** p-value < 0.001*

References

1. World Health Organization. The top 10 causes of death. Fact sheet No. 310, 2008. [Online] Available from: http://who.int/mediacentre/factsheets/fs310/en/index.html [accessed 2012 June 12].
2. Bureau of Policy and Strategy. Ministry of Public Health, Thailand. Number of deaths and death rates per 100,000 population by leading causes of death, 2005 - 2009 [Online]. Available from: http://bps.ops.moph.go.th/index.php?mod=bps&doc=5 [accessed 2012 June 20].
3. Phajuabmo C, Weerakul K, Khanchanawanit R. The Heart Association of Thailand Under Royal Patronage: Acute Coronary Syndrome Registry. The Health Systems Research Institute, Thailand. 2004.
4. Singh VP, Rames V, Somvanshi S, Sinha N, Tewari S, Agrawal S. Cardiovascular risk factors in North Indians: A case-control study. Am J Biochem & Biotechnol. 2006;2(1):19-24.
5. Bjertveitk, Tverdal A. Health consequences of smoking 1-4 cigarettes per day. Top Control. 2005;14(5):315-20.
6. Roy A, Prabhakaran D, Jeemon P, Thankappan KR, Mohan V, Ramakrishnan L, et al. Impact of alcohol on coronary heart disease in Indian men. Atherosclerosis. 2010;210(2):531-5.
7. Happonen P, Voutilatinen S, Salonen JT. Coffee drinking is dose-dependently related to the risk of acute coronary events in middle-aged men. J Nutr. 2004;134:2381-6.
8. Sofi F, Conti AA, Gori AM, Luisi MLE, Casini A, Abbate R, et al. Coffee consumption and risk of coronary heart disease: A meta-analysis. Nutr Metab Cardiovasc Dis. 2007;17:209-23.
9. Don McNeil. Epidemiological Research Methods. New York: John Wiley & Sons. 1996.
10. Mineharu Y, Koizumi A, Wada Y, Iso H, Watanabe Y, Date C, et al. Coffee, green tea, black tea and oolong tea consumption and risk of mortality from cardiovascular disease in Japanese men and women. J Epidemiol Community Health. 2009 Dec 8.
11. Wakabayashi I. Associations between alcohol drinking and multiple risk factors for atherosclerosis in smokers and nonsmokers. Angiology. 2010 Mar 8. 61(5):495-503.
12. Costanzo S, Castelnuovo AD, Donati MB, Iacoviello L, Gaetano GD. Alcohol consumption and mortality in patients with cardiovascular disease. J Am Coll Cardiol. 2010;55:1339-47.
13. Sulo G, Burazeri G, Dehghan A, Kark JD. Partner's smoking status and acute coronary syndrome: population-based case-control study in Tirana, Albania. Croatian Medical Journal. 2008;49(6):751-6.
14. He J, Vupputuri S, Allen K, Prerost MR, Hughes J, Whelton PK. Passive smoking and the risk of coronary heart disease–a meta-analysis of epidemiologic studies. N Engl J Med 1999;340: 920-6.
15. Schröder H, Masabeu A, Marti MJ, Cols M, Lisbona JM, Romagosa C, et al. Myocardial infarction and alcohol consumption: A population-based case-control study. Nutrition, Metabolism & Cardiovascular Diseases. 2007;17:609-15.
16. Barnoya J, Glantz SA. Cardiovascular effects of secondhand smoke: nearly as large as smoking. Circulation 2005;111:2684-98.

17. Arriola L, Martinez-Camblor P, Larrañaga N, Basterretxea M, Amiano P, Moreno-Iribas C, et al. Alcohol intake and the risk of coronary heart disease in the Spanish EPIC cohort study. Heart. 2010;96:124-30.
18. Mukamal KJ, Chung H, Jenny NS, Kuller L, Longstreth WT, Mittleman MA, et al. Alcohol consumption and risk of coronary heart disease in older adults: The Cardiovascular Health Study. J Am Geriatr Soc. 2006;54(1):30-7.
19. Van de Wiel A, de Lange DW. Cardiovascular risk is more related to drinking pattern than to the type of alcoholic drinks. Neth J Med. 2008; 66(11):467-73.
20. Lippi G, Franchini M, Guidi GC. Red wine and cardiovascular health: The “French Paradox” revisited. International Journal of Wine Research. 2010;2:1-7.
21. Ruiz P, Strain EC, Langrod JG. The substance abuse handbook. Philadephia: Lippincott Williams & Wilkins. 2007.
22. DeSciscio P, Prabhu A, Worthley M, Roberts-Thomson R, Sanders P, Willoughby S. Acute Effects of Red Bull on Platelet and Endothelial Function. Heart, Lung and Circulation 2008;17(3): s23-s24.
23. Gardner E, Ruxton C, Leeds A. Black tea – helpful or harmful? A review of the evidence. Eur J Clin Nutr. 2007;61:3-18.
24. Lopez-Garcia E, Dam RM, Willett WC, Rimm EB, Manson JE, Stampfer MJ, et al. Coffee consumption and coronary heart disease in men and women. Circulation. 2006;113:2045-53.