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Short communication

Social factors associated with chest pain in the colored South Africans: results from the CRISIC study

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Abstract

Factors associated with chest pain were investigated in an independent dataset in the colored South Africans outside hospitals. Data were extracted from a cross-sectional study during 1982 in the Cape Peninsula. Information on lifestyle was obtained by interview. Regression modelings were performed. In multivariate analysis, only age (OR 1.54, 95%CI 1.11 to 2.14), mother having high blood pressure (OR 1.53, 95%CI 1.10 to 2.12), and father having stroke (OR 2.02, 95%CI 1.14 to 3.57) remained in the model. The results provide insight into the role of social factors that should be considered in the identification of future prevention and treatment.

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Introduction

Chest pain is usually considered medical emergency and is in need for research on prospective patients outside hospitals [1]. Its causes can be due to many health outcomes such as cardiovascular, pulmonary, GI, chest wall, psychological, and many others. Incidence is about 10-15 per 1000 person-years and one-year mortality rate following chest pain is about 5% in industrial countries [2]. Chest pain is not uncommon but may be prevalent and life-threatening. People outside hospitals potentially at-risk are not well investigated, particularly in Africa. Moreover, no guideline recommendations are documented so far for the prevention of chest pain as a warning sign of ischemic heart disease and suspected myocardial infarction in the general population, not to mention in this minority population [3]. Since little is known about the epidemiology of chest pain outside hospitals, we aimed to investigate social factors that are associated with chest pain in the colored South Africans.

Methods

Setting: Data were extracted from the CRISIC study (http://sada.nrf.ac.za/). The study has been described in detail elsewhere [4]. Briefly, the 1982 cross-sectional cohort of colored South Africans was formed as a research survey. The study sample was drawn from a population of 485,120 coloreds between the ages of 15 and 64 years in the Cape Peninsula as reflected in the 5% subsample of the 1980 Census. One member per household was selected. The total study sample was 976. Information on lifestyle around common coronary heart disease risk factors and knowledge and perception toward these was obtained by interview using a questionnaire containing many variables. They were mostly adopted from valid existing literature and standard questionnaire.

Statistical analysis: In the current analysis, exposures are social and lifestyle factors while the outcome is pain or discomfort in the chest in the past 12 months. Factors associated with chest pain were examined using regression models to present in odds ratios and 95% confidence intervals were also estimated, with $P<0.05$ considered statistically significant. SPSS statistical software version 19.0 was used.

Results

Table 1 presents the characteristics of the study participants. The average age was 39.0±4.2 and more than 70% had received education less than high school. Half of the study sample were current tobacco smokers (>7 cigarettes per week) and alcohol drinkers (definition >7 units (10mg) of alcohol per week) while only about one third were physically active. More than half of the study population was easy to get angry at work. Moreover, one third of the study population had chest pain in the past and about 4% had the chest pain lasting for more than half hour. The average age of people with chest pain (n=319) was 40.7±sd14.4 and 57.1% were female (n=182).

Univariate analysis showed that being female (OR 1.43, 95%CI 1.10 to 1.88), aged more than 40 (OR 1.36, 95%CI 1.04 to 1.77), mother having diabetes (OR 1.70, 95%CI 1.16 to 2.49), high blood pressure (OR 1.79, 95%CI 1.34 to 2.40), or heart attack (OR 1.73, 95%CI 1.20 to 2.49), father having diabetes (OR 1.77, 95%CI 1.01 to 3.09), high blood pressure (OR 1.99, 95%CI 1.33 to 2.38), or stroke (OR 1.97, 95%CI 1.19 to 3.27), and less job satisfaction (OR 1.38, 95%CI 1.06 to 1.81). In the multivariate analysis, only age (OR 1.54, 95%CI 1.11 to 2.14), mother having high blood pressure (OR 1.53, 95%CI 1.10 to 2.12), and father having stroke (OR 2.02, 95%CI 1.14 to 3.57) remained in the model. Detailed potential associated factors were presented in detail in **Table 2**.

Discussion

In the present cross-sectional study, it is firstly showed social factors associated with chest pain among the colored South Africans outside hospitals. It was observed that age, mother having high blood, and father having stroke were significantly associated with chest pain in the past 12 months, whereas education level and coronary heart disease risk factors (smoking, alcohol, and physical activity) were not associated. This could be due to the very similar risk profiles in the study cohort and/or lack of statistical power, which requires even larger study sample in detecting the small but critical effects. It seems that understanding social characteristics of people with chest pain in addition to clinical data is the same important as to help provide cost-effective health prevention strategies for the minorities in the near future.

In consistent with previous studies, women was again found to report a chest pain more often than their counterparts [5,6]. Compared to an earlier study in 3 rural South African communities [7], the prevalence of chest pain is higher in the present study (8-10% and 33%, respectively) but lower than that in African-Americans (48%) [5]. Among the older age group (55-64 years old), the prevalence was also found to be higher (41% in the current study and 33% in the previous studies in the rural communities). This may be due to different study population composition and selection methods. In addition to prevalence difference in different age groups and sexes, this study also corresponds to an earlier Australian study showing that patients presenting with chest pain had the highest level of family history documentation [8]. Moreover, although another earlier study with a small study sample [9] showed more complaints in patients with chest pain from worries or dissatisfaction about work, it disappeared in the multivariate analysis from the current study with larger sample size. This study sheds a light on disclosing social factors associated with chest pain pre-hospitally in the colored South Africans since clinically patient delay for chest pain is considered to be a serious impediment to markedly improving the prognosis in the case of acute coronary syndrome [10,11]. In addition, detailed questions on family history with different medical symptoms from both parents which give merits in the current analysis. It is the first investigation on prevalence and social factors associated with chest pain among the colored South Africans with large study sample up to date. On the other hand, however, some limitations cannot be ignored. First, individual´s hypertension status and body mass index, two common risk factors for coronary heart disease, were not included. Moreover, this study cohort was collected in the 80s and may not readily be the current situation. A follow-up study is warranted. Since this study is cross-sectional, future studies with a longitudinal design will still be needed to further confirm the prognosis for chest pain in the colored South Africans.

In conclusion, socio-demographics, family history, heart disease risk factors and job satisfaction were once hypothesized the associated factors for chest pain among the colored South Africans outside hospitals. After different levels of analyses from univariate to multivariate, it was clearly found that age and family history are the strongest social factors that are associated with chest pain in the colored South Africans. These findings provide insight into the role

of social factors that should be considered in the identification of future prevention and treatment.

Conclusion

Chest pain is usually considered medical emergency but the prevalence and associated social factors are not known in colored South Africans. Age, mother having high blood pressure, and father having stroke were significantly associated with chest pain outside hospitals in colored South Africans. The results provide insight into the role of social factors that should be considered in the identification of future prevention and treatment.

Competing interests

The author declares no competing interest.

Tables

Table 1: Characteristics of participants
Table 2: Factors associated with chest pain

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Table 1: Characteristics of participants	
	N (%)
Sex	
Male	478 (49.0%)
Female	498 (51.0%)
Age	
mean±SD	39.0±4.2
< 40 years old	509 (52.2%)
>= 40 years old	467 (47.8%)
Education	
< high school	702 (71.9%)
≥ high school	274 (28.1%)
Occupation	
Professional	540 (55.3%)
Office work	107 (11.0%)
Manual work	98 (10.0%)
Not working*	231 (23.7%)
Smoking	
Present	499 (51.1%)
Former	113 (11.6%)
None	364 (37.3%)
Alcohol	
Yes	311 (31.9%)
No	665 (68.1%)
Physical activity**	
Yes	428 (43.9%)
No	546 (56.1%)
Chest pain	
Yes	319 (32.7%)
No	657 (67.3%)
Lasting for more than half hour	42/976 (4.3%)
Mother had a heart attack	142 (14.6%)
Mother had a high blood pressure	342 (35.0%)
Mother died of a heart attack	64 (6.6%)
Father had a heart attack	115 (11.8%)
Father had a high blood pressure	108 (11.1%)
Father died of a heart attack	84 (8.6%)
Job satisfaction	
Get angry quickly	572 (58.6%)
Seldom gets angry	404 (41.4%)
*Not working included housewife, unemployment, student, and retired. **Physical activity denotes exercise outside working hours.	

Table 2: Factors associated with chest pain			
	Odds ratio	**95%CI**	**P value**
Female	1.43	1.10-1.88	0.01
Age			
>40 years old	1.36	1.04-1.77	0.03
Education<high school	1.31	0.97-1.78	0.08
Smoking			
Current	1.1	0.82-1.48	0.51
Past	1.86	1.20-2.87	0.01
Physical inactive	1.02	0.78-1.34	0.87
Alcohol	0.91	0.68-1.21	0.5
Mother had diabetes	1.7	1.16-2.49	0.01
Mother had a heart attack	1.73	1.20-2.49	0.04
Mother had a high blood pressure	1.79	1.34-2.40	<0.001
Mother had cholesterol	1.47	0.71-3.03	0.3
Mother had stroke	1.07	0.69-1.67	0.75
Father had diabetes	1.77	1.01-3.09	0.05
Father had a heart attack	1.29	0.85-1.98	0.24
Father had a high blood pressure	1.99	1.33-2.38	0.01
Father had cholesterol	1.17	0.36-3.85	0.8
Father had stroke	1.97	1.19-3.27	0.01
Job dissatisfaction (more angry)	1.38	1.06-1.81	0.02