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Cardiovascular risk factors at a National Heart Referral Center in Sudan.

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عوامل الخطورة القلبية الوعائية بين مرضى المعهد القومي لامراض القلب

مختصر البحث

أهداف هذا البحث هو التعرف على عوامل الخطورة المؤدية الى الاصابة بقصور القلب ودراسة نسبة معدلاتها بين المرضى الذين تم معالجتهم بمعهد القلب السوداني.

تم استخراج ودراسة كل ملفات المرضى الذين ادخلوا الى المستشفى خلال الفترة من عام 2002 الى عام 2006. وباشرت الاحصاءات الى ان العدد الكلي للمرضى في تلك المدة بلغ 12453 كما وبلغت نسبة المصابين بقصور القلب 103 آي بنسبة ماوية تعادل 8,6%. كما وبلغت معدلات العمر للنساء 55 عاماً والرجال 56 عاماً. وبلغ مؤشر كتلة الجسم 30,4 للرجال والنساء.

واظهرت الدراسة ان معدلات عوامل الخطرة المؤدية الى الاصابة بقصور القلب كانت كالتالي: ارتفاع ضغط الدم بنسبة ماوية بلغت 10,2%، واستعمال الشموع بلغت 12,8%، واستخدام التبغ بلغت 14%, وارتفاع السكر بلغت 12,1%، وارتفاع الدهون وصلت إلى 0,8%.

وبلغ معدل السمنة المفرطة 35,6%، واستعمال الشموع بلغت 45,3%، واستخدام التبغ بلغت 30,3%، واستخدام الشموع بلغت 17,7%.

وبلغت نسبة تاريخ اسرى للإصابة بنوبة قلبية 11,1%.

وخلص البحث الى وجود معدلات عالية لعوامل الخطورة القلبية الوعائية ناتجة عن اسباب متعددة يعود معظمها الى التغيير الذي طرأ على نمط الحياة خلال العقود الثلاثة السابقة وставил انتاجها من الاغذية لائحة الالياف والتي تحتوي على كميات كبيرة من الدهون المتعددة والنشويات المكررة والوجبات السريعة ذات الكميات العالية من الملح والدهون بالإضافة الى انتشار ظاهرة التدخين معدلات عالية بين أوساط الشباب. ويختبر البحث بتوصية على حث الجهات الصحية الاهتمام برفع الوعي بين السكان تجاه هذه العوامل واهمية اتباع نمط حيوي وغذي صحي واهتمام بالنشاط البدني اليومي.
Abstract

Justification: The last three decades have shown increasing prevalence of myocardial infarction and ischemic cardiomyopathy among urban population. This has motivated us to undergo a reappraisal of cardiovascular risk factors and assess their nature, magnitude and impact on the rates of coronary heart disease with the objective of measuring the frequency of the rates of the conventional risk factors and identifying the emerging ones. An additional objective was to identify means for prevention of the increasing rates of coronary heart disease.

Methods

A cross-sectional prevalence study to define the profile and determine the prevalence of cardiovascular risk factors in patients with heart failure admitted to Sudan Heart Institute.

Files of patients admitted to Sudan Heart Institute during the period January 2000 - June 2012 were collected and sociodemographic data such as age, gender, body mass index (BMI), locality and six major coronary risk factors: hypertension, diabetes mellitus, smoking, hyperlipidemia, obesity and family history of coronary heart disease were extracted and recorded in specially designed datasheet. The definitions of risk factors and criteria were described.

Results

A total of 12453 cases were collected and analyzed. 73 cases were rejected due to incomplete data. Heart failure constituted 1073 cases out of the total admissions (8.6%). Female to male ratio was 1:1.5. Mean age for males was 56.6 years (±16.6) for females 54 years (±17.4) and mean age for both sexes was 55.5 (±17). Mean BMI for men was 25.9 Kg/m² (±6.4) and 28 (±8.7) for females (p=0.0503)

The main risk factors were hypertension which was seen in 37.5% of the patients while diabetes mellitus formed 30.3%, obesity 35.6%, Smoking accounted for34%, hyperlipidemia in 17.8% and family history of coronary heart disease was seen in 11.1%.

Conclusion

The major risk factors for cardiovascular disease were hypertension, diabetes mellitus, obesity, smoking, hyperlipidemia and family history of coronary artery disease. A change in lifestyle together with rapid urbanization contributed to the emergence of the high rates of risk factors. Improving public awareness to cardiovascular risk factors and reduction of the emergence of unhealthy lifestyle should be the ideal preventive strategy.

Key words: cardiovascular risk factors, coronary heart disease, hypertension, diabetes, heart disease in Sudan, epidemiological transition.

Introduction

It has been our impression, as well as other researchers that the prevalence of cardiovascular disease (CVD) is steadily increasing in most African countries\(^1,^2\). During the last few decades, lifestyle of people in towns and cities has undergone major changes because of improvement in transport, telecommunications and living conditions. Access to media and satellite broadcasts has promoted western lifestyle. Eating has changed as refined carbohydrates, fast foods and saturated fats replaced traditional meals while smoking rates have increased. In addition, there has been a state of rapid urbanization as many rural communities adopted urban life style. These factors operated together to bring about noticeable increase in rates of non-communicable diseases and new cardiovascular risk factors. The epidemiological transition described by
Omran has thus arrived earlier than expected. During the last two decades at least two studies have shown that the rates of coronary artery disease (CAD) are increasing and that hypertension and rheumatic heart disease (RHD) are no longer the main cause of heart disease and heart failure in urban population of Sudan. The objective of this study is to define the profile and determine the prevalence of the current cardiovascular risk factors among patients admitted with heart failure at the Sudan Heat Institutes (SHI) and study their implication in the development of the current rates of CAD.

Patients and Methods

SHI is one of three cardiac national referral hospitals in Sudan. From its inception in 2000 it has provided cardiac care for patients referred from all parts of Sudan. The center encompasses outpatient, emergency department, coronary care unit, wards, Echocardiography laboratory, and cardiac catheterization rooms in addition to operating theatre, intensive care unit and auxiliary services.

All fully documented files of patients admitted during the period January 2000 - June 2012 were selected. Files with incomplete documentation were rejected. Information on sociodemographic data such as age, gender, locality (urban versus rural) and Body Mass Index (BMI) as defined by Center for disease control (CDC) were collected.

Files of patients with heart failure both systolic and diastolic were collected. Systolic heart failure was assumed when left ventricular systolic function was >40% as calculated by echocardiography according to the guidelines of American Society of Echocardiography (ASE). Diastolic heart failure was defined as heart failure in patients with preserved left ventricular systolic function but show evidence of diastolic dysfunction as measured by E/A ratio and deceleration time according to ASE.

Six cardiovascular risk factors: hypertension, diabetes mellitus, smoking, hyperlipidemia, obesity and family history of coronary heart disease were extracted from the files of patients with heart failure and entered in specially designed datasheet.

The definition of risk factors and criteria are shown on table 1.

Statistical analyses

Collected data was entered into the designated database. Analysis was carried out using SPSS Statistics 17 software (IBM SPSS). Frequencies were expressed as percentage with 95% CIs where appropriate. Comparisons of continuous data were made using the Student t-test and those of categorical data using Chi-square. Significance is reached when p < 0.05.

Results

A total of 12453 cases were collected and analyzed. 73 cases were rejected due to incomplete data. Heart failure constituted 1073 cases out of the total admissions (8.6%) from which all parameters are calculated. Systolic heart failure constituted 72.4% and diastolic heart failure 27.6% of the total patients with heart failure. Female to male ratio was 1:1.5. Mean age for males was 56 years (±16.6) for females 54 years (±17.4) with (p=0.06) and mean age for both sexes was 55 (±17). Mean BMI for men was 25.9 Kg/m² (±6.4). Females was 28 (±8.7) no significant difference (p=0.503)

The study has shown that 74.6% of the patients belong to urban community while 25.4 are from rural community.

Figure 1 shows the frequencies of risk factors expressed as percentage with CIs 95%. The main risk factor was hypertension and was seen in 37.5% (males 33.9%, females 42% p=0.002) of the patients while diabetes mellitus formed 30% (males accounted for
24% and females 36% p=0.035). Hypertension prevalence was higher in urban communities (64.3%) when compared to rural, 35.7% (p =0.0004). Diabetes mellitus prevalence rates was also higher in urban population accounting for 78.4% while only 21.6% in rural groups, (p=0.0001).

Table 1: study definitions and criteria for the main risk factors

<table>
<thead>
<tr>
<th>Study definition</th>
<th>Criteria</th>
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<tbody>
<tr>
<td>Hypertension</td>
<td>BP&gt; 140/90 mmHg or current treatment for hypertension</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>Fasting plasma glucose ≥ 7.0mmol/l (126mg/dl) or 2–h plasma glucose ≥ 11.1mmol/l (200mg/dl).</td>
</tr>
<tr>
<td>Obesity (overweight)</td>
<td>BMI (weight in kilogram divided by square of height in meters) is 25.0 to 29.9</td>
</tr>
<tr>
<td>Smoking</td>
<td>Regular smoking of cigarettes &gt; 5 sticks/day or the use of other tobacco containing material &gt; 3 times /day.</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>A total fasting cholesterol &gt; 230mg/dl, or LDL &gt;140mg/dl or Triglycerides &gt; 200mg/dl</td>
</tr>
<tr>
<td>Family history of coronary heart disease</td>
<td>Documented coronary heart disease in parents or siblings before the age of 50 years.</td>
</tr>
</tbody>
</table>

LDL = Low Density Lipoprotein; BMI = Body Mass Index

Discussion
This study provides a base line for cardiovascular risk factors level among the study group. It defines the current perspective of the risk factors present in patients with heart failure attending SHI. As the patients are a mix of people coming from all parts of the country the sample closely represents a spectrum of the current cardiovascular risk factors in similar groups throughout Sudan.

The study confirmed that hypertension is the most common CVD risk factor, as was
reported before in similar studies in Sudan and throughout other African countries. Hypertension was seen in 35.7% of patients from the rural group and 64.3% in the urban community (p = 0.004). The same applied to diabetes mellitus where prevalence in the rural group was 21.6% and 78.4% in the urban group, with highly significant difference (p = 0.0001).

Several population based studies have addressed hypertension in Sudan. In one report the prevalence rate for hypertension, defined as BP 140/90 or greater, was found as 7.5%. This rate is lower than what was reported from Egypt, Nigeria, and the African American of the United States and Caribbean Islands. Significant correlation was found regarding systolic-diastolic blood pressure with age, body mass index and duration of inhabitance in towns.

Although hypertension remained the most common CVD risk factor, the study has shown the emergence of high rates of diabetes mellitus, obesity and smoking. These findings can well be explained by the changes in lifestyle that we described above. It is important to note that smoking emerged as a risk factor of considerable size in the study population accounting for 34%. This must represent cause for concern to the health authorities as smoking rate until the last three decades was low due to religious and social beliefs. However with increased marketing and targeting of special groups e.g. females and young population, the habit of smoking has increased leading to higher rates of smoking. Diabetes mellitus, obesity and hyperlipidemia also emerged with rates higher than what was seen before in community and hospital based studies.

However, a change of this pattern is expected as young people continue to adopt imported lifestyle dominated by eating fast foods, with high content of saturated fats, refined carbohydrates and reduction of physical activity due to excessive use of vehicles in urban communities. The study has shown that 74.6% of the patients belong to urban community while 25.4 are from rural areas. The high rates of risk factors in urban population may be explained by the fact that urban communities are quick to adopt western lifestyle. A similar finding was reported previously by Kengne and Amoah.

Another important contributory factor to the development of the high rates of risk factors is the rapid urbanization that followed the draught that struck the country during the eighties resulting in massive population movement from villages to towns and cities. As a result towns and cities swelled with the new migrants who faced new lifestyle and unexpected stress. The rapid urbanization and the adjustments to the new lifestyle exposed the new migrants to high rates of cardiovascular risk factors. A similar pattern was also demonstrated in a longitudinal study in Kenya, in which moving from a rural to urban setting produced significant increases in BP within a short time. This has impacted a serious health burden as the rates of hypertension and diabetes increased.

The predicament of emerging high cardiovascular risk factors appeared to involve several other Sub-Saharan African countries and a similar study addressing cardiovascular risk factors in an urban area of Togo showed high rates of hypertension comparable to that in Sudan but unlike our study obesity and hyperlipidemia accounted for 25.2% and 26% respectively. A study from Lome reported very high rates of cardiovascular risk factors when compared to our results: dyslipidemia (76.9%), hypertension (75.3%), left ventricular hypertrophy (72.8%), abdominal obesity (71.1%), hyperuricemia (50.5%), hyperglycemia (41.9%), overt diabetes...
modifiable risk factors are not only demanded but commanded by the impending epidemic\(^3\).

**Conclusion**

Changes in life style and habits has contributed to the emergence of high rates of cardiovascular risk factors such as hypertension, diabetes mellitus, obesity smoking and hyperlipidemia. Prevention of the emergence of unhealthy lifestyles and the preservation of the health-promoting aspects of the traditional African life should be part of the present and future health strategies. Additionally improving public awareness to cardiovascular risk.

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**References:**


