ABSTRACT

Objective: Obesity and hypertension, which are associated with cardiovascular disease and Type 2 Diabetes Mellitus, has become a major health concern in Aruba. The present study aims to determine the incidence of obesity and potential hypertension among Hyatt employees in Oranjestad, Aruba.

Method: On November 9th, 2012, students from the Xavier University School of Medicine, Aruba conducted a health fair for employees of the Hyatt Hotel in Aruba – one of the largest hotels in the capital city of Oranjestad. Medical students collected the information through questionnaire-based survey and physical examinations. This cross-sectional study measured the weight, height, random blood glucose, systolic and diastolic blood pressures.

Results: One hundred and fourteen individuals (19%) participated out of the five hundred and nine Hyatt employees. Obesity, hypertensive readings and potential diabetes or pre-diabetes was noted among majority of the participants. 46% (52/114) of the respondents were overweight and 37% (43/114) was obese. Hypertensive BPs were detected in 33% (38/114) of participants. Students’ t test found no significant correlation between gender and the following variables: BMI, random blood glucose, systolic/diastolic blood pressure or hypertensive findings. Based on random blood sugar readings, 4/114 individuals were at risk for diabetes. The four individuals had a random blood sugar reading of 11.1 mmol/L or higher.

Conclusion: Many of the participants of this study presented with both obesity and possible hypertension. It is logical to expect a significant risk for cardiovascular disease and type 2 DM in this population.

Keywords: Aruba, Caribbean, diabetes, hypertension, incidence

From: ¹Khatija Pinky Ali, Windsor University, St Kitts, ²Anil Kumar Dosaj, Windsor University, School of Medicine, St Kitts, ³Natasha Priya Dyal, Xavier University, School of Medicine, Aruba.

Correspondence: Mrs K Ali, School of Medicine, Windsor University St Kitts, West Indies. Email: pinkykali@icloud.com

INTRODUCTION

Obesity and hypertension are significant public health concerns and are risk factors for developing diabetes mellitus type 2 and cardiovascular diseases. There have only been a few studies focused on this emerging public health concern in islands of the Netherlands Antilles. A study was conducted among school children in Bonaire, Netherlands Antilles (1). Significant prevalence of being overweight (17%) and obesity (12%) were found amongst these children. The levels of hypertension amongst the obese children was 53% and amongst overweight children, 23% (1). During the present time, the island of Bonaire is a special municipality of the Netherlands. In May 2008, the Special Committee on Obesity of Aruban Parliament was established to help battle this crisis. According to the department of Public Health, the prevalence of overweight amongst adults in Aruba is 77%. In the year 2006, 82.8% of the male adults (aged 24-65 years) were overweight while 72.1% of females aged 24-65 years were overweight (2). To help develop a more complete understanding of these significant health concerns and their prevalence in Aruba, students of Xavier University School of Medicine in Aruba have been collecting health metrics during school sponsored and Family Medicine Interest Group (FMIG) run health fairs. This study presents data collected during one of these health fairs conducted among employees of the Hyatt hotel chain in Aruba, Kingdom of the Netherlands on November 9th, 2012.

The article published by Sowers et al. highlights the crucial role that hypertension and diabetes play with regard to cardiovascular disease. A strong correlation is seen between hypertension, and hypertension with hypertension being approximately “twice as frequent” in diabetic patients than among those without diabetes (3). The review published by Sowers et al. emphasizes the correlation using data provided by the Captopril Prevention Program (CAPPP)
and Hope Trial which examined risk factors which may lead to cardiovascular diseases (3). Furthermore, other studies have concluded that “diabetes is a cardiovascular disease.” (4) The fundamental conclusion of these studies is that cardiovascular disease has a direct correlation with hypertension and diabetes. The present study aims to determine the incidence of co-morbid obesity and possible hypertension among Hyatt employees in Oranjestad, Aruba.

**METHODS**

All employees of the Hyatt hotel in Aruba were instructed to attend the health fair held on November 9th, 2012. They completed a survey questionnaire and underwent a series of medical examinations. Their age, gender, marital status, number of children/dependents, weight, height, blood pressures and random blood sugar were recorded. Participants were not required to fill in all the details or undergo all the exams and no personally identifiable information was collected. All participants were above the legal age of consent in Aruba. There were 114 participants in the study out of 590 employees working at Hyatt. Thus, 19% of the employees participated in the study.

Students measured blood pressure with standard school supplied mercury sphygmomanometers, administered the finger stick blood test to measure blood glucose with One Touch Ultra 2 glucose meters, and measured height using standard measuring tape. Weight was noted using weighing scales – height and weight were used to calculate body mass index (BMI) using the National Heart, Lung and Blood Institute BMI charts (5). The results were compiled and analyzed using Statistical Package for Social Sciences (SPSS) Version 20 for Windows. Student’s t test was used to determine any association between gender and the
following parameters: BMI, random blood glucose, systolic/diastolic blood pressure and hypertension.

RESULTS

All 114 participants underwent a random blood sugar test. The mean blood sugar level was 6 mmol/L. Seven participants (6%) had a value between 7.8 and 11 mmol/L which is considered pre-diabetic while 4 participants (4%) had a random blood sugar above 11.1 mmol/L, considered diabetic.

Body Mass Index (BMI) is a measure of body fat based upon height and weight. A BMI below 18.5 is underweight, and there were none in our sample. Normal BMI is between 18.5 and 24.9. A BMI between 25 and 29.9 is overweight. And a BMI above 30 is Obese. The mean BMI of this sample was 29. Of the 114 participants, 43 (38%) were obese and 52 (46%) were overweight.

The mean systolic blood pressure was 125 mm Hg. The mean diastolic blood pressure was 83 mm Hg. Figure 2 shows the distribution of blood pressure versus age of respondents. In this sample 33% (38/115) of participants had blood pressures above 140 mm Hg systolic and/or above 90 mm Hg diastolic.

In this sample, 12% (14/114) were overweight and hypertensive. Similarly, 18% (21/114) were obese and potentially hypertensive. Only three (3) participants that exhibited high blood pressures were neither overweight, nor obese.

No significant correlations were found between gender and BMI, assuming equal variances, p-value (0.256) (Table 1). There was no difference between males and females with
regard to systolic blood pressure \((p = 0.185)\) or diastolic pressure \((p = 0.420)\). Mean systolic blood pressure for men was \(127.9 \pm 15.5 \, \text{mm Hg}\). Mean systolic blood pressure for women was \(123.8 \pm 16.2 \, \text{mm Hg}\). Mean diastolic blood pressure for men and women was \(84.1 \pm 11.2\) and \(82.2 \pm 12.3\) mm Hg.

**DISCUSSION**

Approximately 10% of this sample is at risk of or is already suffering from diabetes mellitus. A random blood sugar above 11.1 mmol/L is considered at high risk for diabetes, which accounted for 4% of this sample. And 6% of this sample had blood sugars between 7.8 and 11 mmol/L; considered pre-diabetic. However it must be noted that fasting blood sugar test is the gold standard for diagnosis of diabetes.

The mean BMI was 29, which is overweight and very close to obesity (30). In this sample 38% were obese and 46% were overweight.

In this sample, 12% (14/114) were both overweight and hypertensive. While 18% (21/114) were both hypertensive and obese. It must again be noted that just one reading of blood pressure is not sufficient for a diagnosis of hypertension. The standard to declare hypertension is systolic blood pressure above 140 mm Hg and/or Diastolic blood pressure above 90 mm Hg, across three separate readings on three separate occasions. Further this data’s validity must be taken into consideration that the participant’s use of blood pressure medication was not collected.

No significant correlations were found between gender and the parameters of BMI, systolic/diastolic blood pressures and hypertensive levels.
This is a fairly localized sample (one hotel) and a small sample size. These results may not be generalizable to the Aruban public. There have been other health fairs that were conducted and information is being collected but to date no data has been published.

CONCLUSION

This was a small-scale study on a localized sample and shows significant health concerns of obesity, diabetes mellitus and hypertension mandating further study and analysis. This sample exhibited significant risks for cardiovascular disease and diabetes mellitus. 83% of the sample is overweight or obese and 10% being at risk of diabetes or diabetic.

Future studies should be conducted to assess if similar levels of risk exist in the general population. All future health fairs should continue this surveillance and provide the results for dissemination to journals and appropriate public health authorities. Majority of the participants exhibited the risk factors of obesity, hypertension and potential diabetes or pre-diabetes. Found 46% (52/114) of the sample was overweight and 37% (43/114) was obese. High blood pressures were detected in 33% (38/1150) of participants. Student’s t test found no significant correlation between sex and the following variables; BMI, random blood glucose, systolic/diastolic blood pressure or levels of suspected hypertension.

AUTHORS’ NOTE

The authors were not compensated or funded in any way for the preparation of this manuscript. This study has not been submitted elsewhere. We understand and agree that if the manuscript is accepted for publication, copyright in the article, including the right to reproduce the article in all forms and media, shall be assigned to the publisher.
REFERENCES


Table 1: Body Mass Index and Blood Pressure among Male and Female Participants.

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<th>Gender</th>
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Fig 1: Age vs BMI

Fig 2: Age versus Systolic and Diastolic Blood Pressures