



Original Article

Prevalence of prehypertension and its associated factors among adults visiting outpatient clinic in Northeast Malaysia



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المخلص

أهداف البحث: "ما قبل فرط ضغط الدم" يشير إلى ضغط الدم 120 - 139 مم زئبق الانقباضي أو 80 - 89 مم زئبق الانبساطي. إن تقدير معدل انتشار "ما قبل فرط ضغط الدم" في السكان وتحديد العوامل المرتبطة بالقلب والأوعية الدموية مهم لتقليل الوصول لفرط ضغط الدم. تهدف هذه الدراسة لتحديد معدل انتشار "ما قبل فرط ضغط الدم" وعوامله المرتبطة بين الماليزيين البالغين.

طرق البحث: في 2015 أجريت دراسة مستعرضة بين البالغين في العيادات الخارجية شمال شرق ماليزيا. أجريت مقابلة وجها لوجه باستخدام النسخة الملاوية والإنجليزية لاستبانة مراقبة (الأمراض غير المعدية) الماليزية. تحوي هذا الاستبانة على المعلومات الاجتماعية والديموغرافية، وحالة نمط الحياة والبيانات الأنثروبومترية. كما تم قياس ضغط الدم ثلاث مرات بواسطة مقياس ضغط الدم، تم تجاهل قيمة القياس الأولى وتم تسجيل متوسط ضغط الدم من القراءتين الأخرى للمزيد من تحليل البيانات. تم عمل الانحدار اللوجستي لتحليل العوامل المرتبطة لما قبل فرط ضغط الدم.

النتائج: انضم 151 بالغاً لهذه الدراسة بمعدل انتشار "ما قبل فرط ضغط الدم" 37.1%. كانت العوامل المرتبطة مع ما قبل فرط ضغط الدم في هذه الدراسة العمر، الذكور ومحيط الخصر غير الطبيعي كما تم تسجيله بواسطة تحليل الانحدار اللوجستي المتعدد.

الاستنتاجات: في هذه الدراسة معدل انتشار ما قبل فرط ضغط الدم أعلى من معدل انتشار فرط ضغط الدم المنشور في الأدبيات. العمر، الجنس ومحيط الخصر غير الطبيعي هي عوامل مرتبطة ذات دلالة تؤدي إلى "ما قبل فرط ضغط الدم".

الكلمات المفتاحية: العوامل المرتبطة؛ فرط ضغط الدم؛ ما قبل فرط ضغط الدم؛ انتشار؛ محيط الخصر

Abstract

Objectives: Prehypertension refers to a systolic blood pressure of 120–139 mmHg systolic or a diastolic blood pressure of 80–89 mmHg. Estimation of the prevalence of prehypertension in the population and identification of cardiovascular associated factors are important to reduce progression to hypertension. This study aimed to determine the prevalence of prehypertension and its associated factors among Malaysian adults.

Methods: In 2015, a cross-sectional study was conducted among adults visiting an outpatient clinic in Northeast Malaysia. Face-to-face interviews were conducted using Malay and English versions of the Malaysia Non-Communicable Disease surveillance questionnaire. This instrument captured information about sociodemographic, lifestyle status, and anthropometric data. Blood pressure was measured three times with a sphygmomanometer, the first measurement value was discarded, and an average of blood pressure from the second two readings was recorded for further data analysis. Logistic regression was performed to analyse factors associated with prehypertension.

Result: A total 151 adults participated in the study, and the prevalence of prehypertension was 37.1% (95% confidence interval [CI]: 29.29, 44.69). Factors associated with prehypertension in this study were age (adjusted odds ratio [aOR] = 1.06 95% CI: 1.02, 1.11; $p = 0.007$), male sex (aOR = 4.44 95% CI: 1.58, 12.44; $p = 0.005$), and abnormal waist circumference (aOR = 31.65 95% CI: 11.25, 89.02; $p < 0.001$) as determined by multiple logistic regression analysis.

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Conclusion: In this study, the prevalence rate of prehypertension of 37.1% is higher than that of hypertension reported in the literature. Age, male sex, and abnormal waist circumference are significant associated factors that lead to prehypertension.

Keywords: Associated factors; Hypertension; Prehypertension; Prevalence; Waist circumference

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Introduction

Prehypertension is a new terminology that was first introduced in the guidelines of The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC-7) in 2003.¹ “Prehypertension” is defined as a systolic blood pressure (SBP) of 120–139 mmHg and/or diastolic BP (DBP) of 80–89 mmHg. The term is intended to replace the phrase “borderline hypertension”, which has been used previously. The older classification was complicated and did not convey the seriousness of the condition, whereas it has been noted that prehypertension itself is associated with cardiovascular risk and can progress to hypertension at twice the rate of those with lower values.

Based on data obtained from the National Health and Nutrition Examination Survey (NHANES) 1999–2000, the reported overall worldwide prevalence of prehypertension is 31%. According to the National Heart, Lung, and Blood Institute, the prevalence of prehypertension in 2008 was highest among younger adults aged 18–29 years old, and often undiagnosed.²

The overall prevalence of prehypertension in Malaysia is 37%,³ a rate higher than the prevalence of hypertension itself. Two local studies showed prevalence rates of prehypertension among undergraduate university students of 42.9%⁴ and 30.1%,⁵ respectively. Both of these studies gathered data from adults aged 18–25 only; hence, a study to examine the prevalence of prehypertension within a wider age group in the community is needed.

An important risk of prehypertension for patients is the development of hypertension. The Trial of Preventing Hypertension Study (TROPY) showed that rate of conversion to hypertension was 37% in 4 years for patients with higher than normal BP. In addition, it was found that over 4 years, almost two-thirds of patients diagnosed with prehypertension developed stage 1 hypertension.⁶

There are many factors associated with hypertension that can be classified as either modifiable or non-modifiable risk factors. Examples of non-modifiable risk factors are age, sex, ethnicity, and family history of hypertension. On the other hand, amount of physical activity, dietary intake, smoking, alcohol intake, and body weight are among the known and established modifiable risk factors for hypertension.

However, associated risk factors for prehypertension have not been well studied, and it is unknown whether they are the same as the risks for hypertension. This uncertainty has resulted in a lack of data regarding the association with other cardiovascular risk factors. The identification of modifiable or non-modifiable risk factors is important to reduce the possibility of developing further complications associated with cardiovascular disease (CVD). If the risk is identified at an earlier age, preventative behaviours can be established to prevent the onset of hypertension and reduce the prevalence of CVD.

The purpose of this study was to examine the prevalence of patients with prehypertension visiting an outpatient clinic in a tertiary hospital in Northeast Malaysia. We also aimed to identify significant associations between prehypertension and modifiable and non-modifiable risk factors using the Malaysia Non-Communicable Disease (NCD) surveillance questionnaire.

Materials and Methods

The present study was a cross-sectional study conducted at an outpatient clinic of the university hospital in Northeastern Peninsular Malaysia from 1 June 2015 until 30 September 2015. Convenience sampling was used, in which all adults who attended the clinic were approached, and those who agreed to undergo screening were then selected according to the inclusion and exclusion criteria. The exclusion criteria were: established hypertension; pregnancy; and chronic non-communicable diseases, such as diabetes, hypertension, hypercholesterolaemia, chronic and end-stage renal disease, and cancer. There were 155 individuals eligible for inclusion, and 151 completed the study, for a 97.4% response rate.

Our objectives

1. To determine the proportion of prehypertension among adults in Northeastern Peninsular Malaysia.
2. To identify the sociodemographic, lifestyle status, and anthropometric factors associated with prehypertension among adults in Northeastern Peninsular Malaysia.

Research tools and materials

1. Malaysia NCD (Non-Communicable Disease) surveillance questionnaire

The face-to-face interview was performed using the Malaysia NCD surveillance questionnaire, which consists of measurement of sociodemographic, lifestyle status, and anthropometric data⁷ after the subjects consented to the study.

The Malaysia NCD surveillance questionnaire consists of three parts involving socio-demographic data, lifestyle status, and anthropometric measurement. The first part consists of sociodemographic data including age, sex, ethnicity, marital status, occupation, educational level, household income, and family history of hypertension. Lifestyle status data including smoking status and alcohol intake, level of physical activity, and dietary status were reported on the second part of the questionnaire. The third part consisted of anthropometric

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