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Hypertension: Discrepancy between Enquiry and Measurement, Understanding Blood Pressure Readings

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Abstract

Long-term hypertension is a risk factor for many diseases, including heart disease, stroke and kidney failure. Long term hypertension is more common than long term hypotension. Long-term hypertension often goes undetected because of infrequent monitoring and the absence of symptoms. The objectives will be to study prevalence of hypertension among Dubai adult population by joining both the results of enquiry and the results of measurement. Dubai Household Health Survey 2014 was conducted in 2014 as a Cross-sectional, multistage, stratified, Cluster survey. Houses were visited to obtain detailed information on the different health-related issues. Individuals aged ≥18 years were investigated for the history of hypertension. Hypertension questions of the questionnaire were asked to 3716 persons. In addition, participants went through three times of blood pressure measurement by calibrated mercury sphygmomanometer conducted by well trained nurses on blood pressure measurement skills. Data were entered to the computer using Excel sheet and analyzed using SPSS 21. Results of both approaches were joined to obtain the result of prevalence. The combined results of both positive answering question (Having hypertension), and measuring blood pressure the study showed that the prevalence of hypertension among total Dubai population was 24.6% and pre hypertension stage is about 49.7%. Regarding Emirati population, 20.1% were hypertensive, and 43.4% were pre hypertensive. Regarding Non-Emirati population, 25% were hypertensive, and 50.1% were pre hypertensive. The study concluded that about one quarter of total Dubai population have had hypertension, and half of the population are having prehypertension. Estimations explained that there are discrepancy in prevalence of hypertension as per answering a question of having hypertension compared to measuring blood pressure by sphygmomanometer, which reflect more hidden hypertension cases detected only by measuring. Accurate and standardized measuring of blood pressure should be always considered as golden standard in detection of hypertension. Population-based hypertension screening program has to be activated and consequently adequate prevention and control strategy has to be vitalized.

Keywords

Hypertension, History, Measurement, Discrepancy, Population Based, Dubai

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1. Introduction

Hypertension is considered as a silent killer because the affected person may be not aware about it. Most people with high blood pressure actually have no symptoms at all. [1] Globally, the overall prevalence of raised blood pressure in adults aged 25 and over was around 40% in 2008. Worldwide, raised blood pressure is estimated to cause 7.5 million deaths, about 12.8% of the total of all deaths. This accounts for 57 million disability adjusted life years (DALYS) or 3.7% of total DALYS. [2] Almost one billion people have uncontrolled hypertension worldwide. [3] The African region has the highest prevalence rate, 46% of adults aged 25 and above, whereas the Americas have the lowest

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prevalence, at 35%. In contrast with other CVD risks such as high BMI, the burden of hypertension is greater in lower income countries than higher income settings. [4]

It is necessary to conduct correct measurement of blood pressure for the diagnosis of hypertension. In a clinical setting, blood pressure is measured by the auscultation method using a mercury or aneroid sphygmomanometer, or using an automatic sphygmomanometer that has been calibrated by the auscultation method, and maintaining the arm-cuff position at the heart level. Blood pressure measurement, in strict accordance with the procedure shown in, is known to more accurately reflect the true blood pressure than data obtained by disregarding this procedure. [5]

Systolic and diastolic arterial blood pressures are not static but undergo natural variations from one heartbeat to another and throughout the day (in a circadian rhythm). They also change in response to stress, nutritional factors, drugs, disease, exercise, and momentarily from standing up. Sometimes the variations are large. Hypertension refers to arterial pressure being abnormally high, as opposed to hypotension, when it is abnormally low. Along with body temperature, respiratory rate, and pulse rate, blood pressure is one of the four main vital signs routinely monitored by medical professionals and healthcare providers. Measuring pressure invasively, by penetrating the arterial wall to take the measurement, is much less common and usually restricted to a hospital setting. [6, 7]

Long term hypertension is a risk factor for many diseases, including heart disease, stroke and kidney failure. Long term hypertension is more common than long term hypotension. Long term hypertension often goes undetected because of infrequent monitoring and the absence of symptoms. [8-10]

Hypertension was investigated during the implementation of Dubai Household Health Survey 2014 in two approaches, enquiry and measurement. This work will present the results of the two approached independently and jointly. The objective of this study will be to study prevalence of hypertension among Dubai adult population by joining both the results of enquiry and the results of measurement.

2. Methodology

Dubai Household Health Survey 2014 (DHHS 2014) was conducted in 2014 as a Cross-sectional, multistage, stratified, Cluster survey. It was carried out on 3298 families both UAE nationals and residents families from expatriates. Houses were visited to obtain detailed information on the different health-related issues. According to Dubai Statistical Center [11] the total population of Dubai at the end of 2014 was 2327350 (males 1613175, females 714175) (UAE 212000, Expatriates 2115350). Individuals aged ≥18 years were investigated for the history of hypertension. Related questions (Have you been diagnosed by doctor as hypertension case and put of treatment during last 12 months). Hypertension questions of the questionnaire were asked to 3716 persons. In addition, participants went through three times blood pressure measurement by calibrated mercury sphygmomanometer conducted by well trained nurses on blood pressure measurement skills. Data were entered to the computer using Excel sheet and analyzed using SPSS 21. Results of both approaches were joined to obtain the result of prevalence.

3. Results

Figure 1 shows Distribution of hypertension among study population (their answer to hypertension question) according to nationality and gender. About 20% of male Emirati answered having hypertension, 18% of total Emirati women revealed having hypertension as per their answer to the question, and the total of 18.9% of both male and female Emirati showed having high blood pressure, while expatriate adults males and females showed results of 2.9% and 3.4% respectively. As for the total Dubai population, the survey showed 3.2% for males, 5.1% for females, and 3.5% for the total.

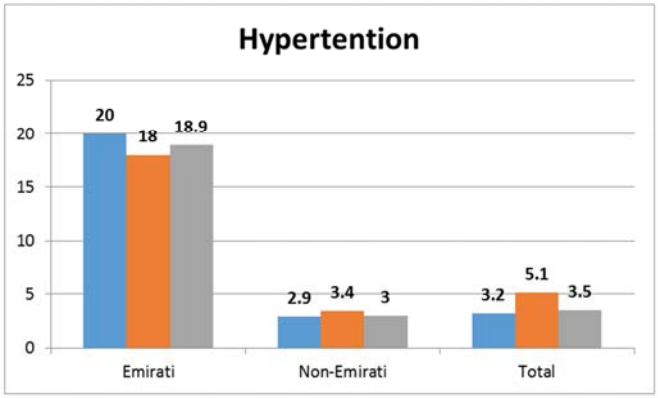

Figure 1. Distribution of hypertension among study population (their answer to hypertension question) according to nationality and gender (Blue color for males and red color for females).

As for blood pressure by measurement among Dubai Population, the study showed that about 8.5% of Emirati were having high systolic blood pressure, 16.6% of expatriates showed high systolic, As for diastolic blood pressure measurement, the study revealed that about 9.6% of Emirati shows high, and 19.0% of expatriate population showed high diastolic blood pressure, Figure 2.

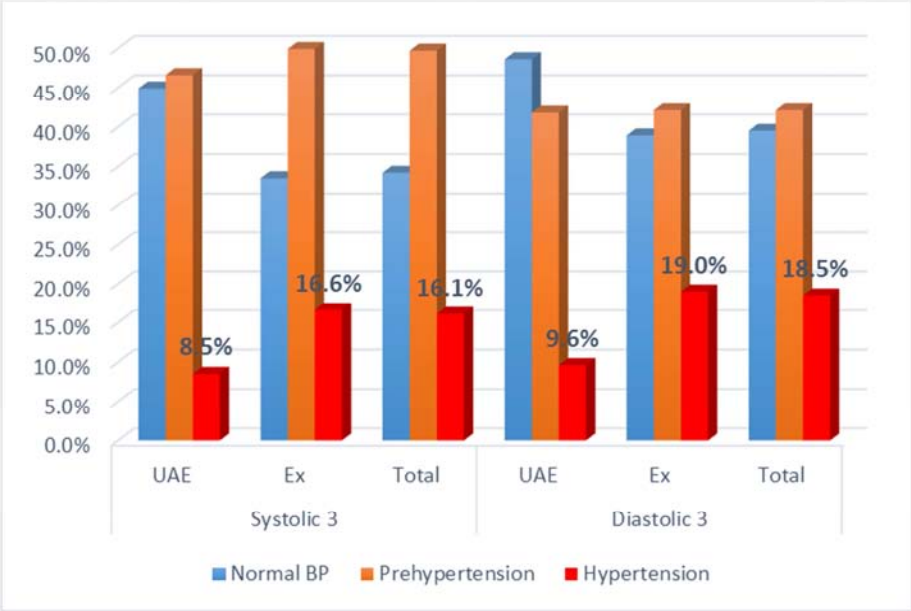

Figure 2. Distribution of the measurements of blood pressure among Dubai population (systolic and diastolic) in the third result according to nationality.

The combined results of both positive answering question (Having hypertension), and measuring blood pressure the study showed that the prevalence of hypertension among total Dubai population was 24.6% and pre hypertension stage is about 49.7%. Regarding Emirati population, 20.1% were hypertensive, and 43.4% were pre hypertensive. Regarding Non-Emirati population, 25% were hypertensive, and 50.1% were pre hypertensive, Figure 3.

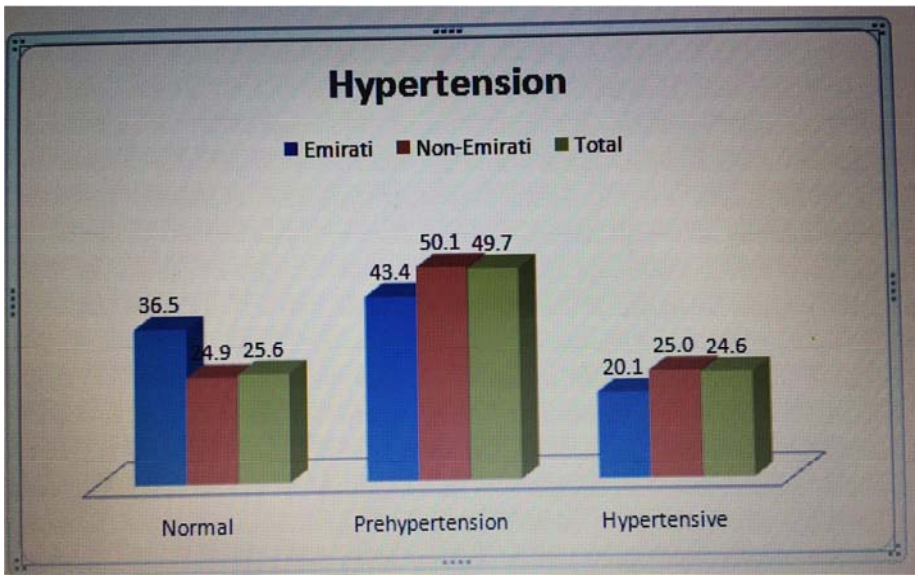

Figure 3. Distribution of the combined result of question and measurement of blood pressure among Dubai population according to nationality.

4. Discussion

The current study showed that hypertension is about 24% among total population and prehypertension is about 49% among total population. It is much higher among Emirati when answering question of being diagnosed within the last 12 months, and less among expatriate population while it is more higher among expatriate when it comes to direct measuring of blood pressure with sphygmomanometer. This

finding reflect a fact that undiscovered (hidden) hypertension is quite high which necessitate population based screening. This result is similar to other studies (Nahla, 2008) which showed 43.0% were pre-hypertensive and the overall prevalence of HTN was 25.2%. Among all diagnosed hypertensive cases only less than of third (30.4%) were aware of being hypertensive. [12]

Similar results were reported by Grotto et al. from Israel. [13] These results also agree with results from China, [14] Attica, [15] and Iran. [16] A lower rate (34%), however, was reported among Taiwanese adults. [17] On the other hand, 54.1% of prediabetes Omani population, 2008, had prehypertension. This higher rate may be because the Omani study was conducted among prediabetic individuals. [18]

The present study showed lower population hypertensive profile comparing to other studies, which showed high prevalence of hypertension in all countries, with the highest being 78% for South Africa. The prevalence levels of hypertension observed in this study are broadly consistent with those reported by previous national surveys of older adults conducted in China and Mexico. [19,20] National hypertension survey data have not previously been available for India, the Russian Federation or Ghana, either for their adult populations in general or for older people more specifically. A 2003 national survey in South Africa, using similar methodology to SAGE, found a prevalence of hypertension of only 31% for men aged 65 years and over and 37% for women in the same age group. [21] The prevalence of hypertension in the SAGE countries is comparable to that of older people in high-income countries. [22-24] Indeed, South Africa's prevalence is the highest ever reported by a nationally representative survey of people aged 50 and over for any country. It is substantially higher than recently published estimates for South Africa and 11 other sub-Saharan African countries. [25]

5. Conclusion

The study concluded that about one quarter of total Dubai population have had hypertension, and half of the population are having prehypertension. Estimations explained that there are discrepancy in prevalence of hypertension as per answering a question of having hypertension compared to measuring blood pressure by sphygmomanometer, which reflect more hidden hypertension cases detected only by measuring. Accurate and standardized measuring of blood pressure should be always considered as golden standard in detection of hypertension. Population-based hypertension screening program has to be activated and consequently adequate prevention and control strategy has to be vitalized.

Conflict of Interest

The authors declare that they do not have any conflict of interest.

References

[1] WHO. High Blood Pressure: The Silent Killer. Available from: http://www.wpro.who.int/world_health_day/2013/high_blood_pressure_brochure_wpr.pdf. Accessed 27 March 2017.

[2] WHO. Global Health Observatory (GHO) data. Raised blood pressure: Situation and trends. Available from: http://www.who.int/gho/ncd/risk_factors/blood_pressure_prevalence_text/en/ Accessed 27 March 2017.

[3] WHO. A global brief on Hypertension. Silent killer, global public health crisis. Geneva, Switzerland: WHO; 2013. 40.

[4] Ibrahim MM, Damasceno A. Hypertension in developing countries. Lancet 2012; 380:611–619.

[5] The Japanese Society of Hypertension Guidelines for the Management of Hypertension (JSH 2009). Hypertens Res 2009; 32: 3–107.

[6] Booth J (1977). "A short history of blood pressure measurement". Proceedings of the Royal Society of Medicine. 70 (11): 793–9.

[7] OHSU Health Information. "Vital Signs (Body Temperature, Pulse Rate, Respiration Rate, Blood Pressure)". Oregon Health & Science University. Retrieved 2014-04-16.

[8] Ogedegbe, Gbenga; Pickering, Thomas (2010-11-01). "Principles and techniques of blood pressure measurement". Cardiology Clinics. 28 (4): 571–586. doi:10.1016/j.ccl.2010.07.006.

[9] O'brien, Eoin (2001-01-01). "Blood pressure measurement is changing!". Heart. 85 (1): 3–5. doi:10.1136/heart.85.1.3. ISSN 1468-201X.

[10] American Heart Association. "Understanding blood pressure readings". 11 January 2011. Retrieved 30 March 2011.

[11] Dubai Statistics Center. Population Bulletin, Emirate of Dubai, 2014. Available from: https://www.dsc.gov.ae/Publication/Population%20Bulletin%20Emirate%20of%20Dubai%202014.pdf Accessed on Tuesday 13 December 2016.

[12] Ibrahim NK, Hijazi NA, Al-Bar AA. Prevalence and Determinants of Prehypertension and Hypertension among Preparatory and Secondary School Teachers in Jeddah. J Egypt Public Health Assoc. 2008;83(3-4):183-203.

[13] Grotto I, Grossman E, Huerta M, Sharabi Y. Prevalence of prehypertension and associated cardiovascular risk profiles among young Israeli adults. Hypertension.2006; 48(2):2549.

[14] Sun Z, Zheng L, Wei Y, Li J, Zhang X, Zhang X, et al. The prevalence of prehypertension and hypertension among rural adult s in Liaoning province of China. Clin Cardiol. 2007; 30(4):1837.

[15] Chrysohoou C, Pitsavos C, Panagiotakos D, Skouma s J, Stefanadis C. Association between prehypertension status and inflammatory markers related to atherosclerotic disease: The ATTICA Stud y. Am J Hypertension. 2004; 17(7):56873.

[16] Esteghamati A, Gouya MM, Abbasi M, Delavari A, Alikhani S, Alaedini F, et al. Prevalence of diabetes mellitus and impaired fasting glucose in the adult population of Iran: The National Survey of Risk Factors for NonCommunicable Diseases of Iran. Diabetes Care. 2008;31 (1): 968.

[17] Tsai AC, Liou JC, Chang MC. Interview to study the determinants of hypertension in older adults in Taiwan: a population n based crosssectional survey. Asia Pac J Clin Nutr. 2007;16(2):33845.

[18] Ganguly SS, AlShafaee MA, Bhargava K, Duttagupta K K. Prevalence of prehypertension and associated cardiovascular risk profiles among pre diabetic Omani adults. BMC Public Health. 2008; 8:1 08.14.

[19] GuD, Reynolds K,Wux X, et al. InterASIA Collaborative Group The International Collaborative Study of Cardiovascular Disease in ASIA. Prevalence, awareness, treatment, and control of hypertension in China Hypertension 2002, vol. 40 (pg. 920-27)Google Scholar CrossRef PubMed

[20] Barquera S, Campos-Nonato, Hernández-Barrera L, et al.. Hypertension in Mexican adults: results from the National Health and Nutrition Survey 2006, Salud Pública de México, 2010, vol. 52 Suppl 1 (pg. S63 -7)

[21] Department for Health, Government of South Africa, The 2003 South African Demographic and Health Survey, 2007 http://www.measuredhs.com/pubs/pdf/FR206/FR206.pdf (7 October 2013, date last accessed)

[22] Primatesta P, Poulter N. Hypertension management and control among English adults aged 65 years and older in 2000 and 2001, J Hypertens, 2004, vol. 6 (pg. 1093-98).

[23] Egan BM, Zhao Y, Axon RN. US trends in prevalence, awareness, treatment, and control of hypertension, 1988-2008, JAMA, 2010, vol. 303 (pg. 2043-50)

[24] Macedo ME, Lima MJ, Silva AO, Alcantara P, Ramalhinho V, Carmona J. Prevalence, awareness, treatment and control of hypertension in Portugal: the PAP study, J Hypertens, 2005, vol. 23 (pg. 1661 -66)

[25] Twagirumukiza M, De Bacquer D, Kips JG, de Backer G, Stichele RV, Van Bortel ML. Current and projected prevalence of arterial hypertension in sub-Saharan Africa by sex, age and habitat: an estimate from population studies. J Hypertens. 2011 Jul; 29(7): 1243-52. doi: 10.1097/HJH.0b013e328346995d.