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Bioscience Research

Print ISSN: 1811-9506 Online ISSN: 2218-3973

Journal by Innovative Scientific Information & Services Network

RESEARCH ARTICLE BIOSCIENCE RESEARCH, 2020 17(2): 1142-1146. **OPEN ACCESS**

Hypertension associated risk factors among Hunan population in China

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The purpose of this study was to determine the prevalence and associated risk factors among Chinese Han population in Hunan. This is a retrospective study of 2,119 participants who was conducted at First Xiang Ya Hospital Central south university Hunan, China, over a period of January 2016 to December 2018. Data were collected from medical record files which was relating to demographic of individual participants such as age, gender, BMI, blood pressure, a history of alcohol consumption, cigarette smoking and as well as diabetes. Statistical significant was analyzed by SPSS 20.00 with the chi-square test. The prevalence of hypertension was 27.38%. This study was carried out of 2119 hypertension patients among male 56%, which was higher than female 43.9%. The age specific prevalence of hypertension in male 34.79% and female 34.12%, which was no significant found. While 31.50 %, 33.69 % and 26.28 % and 39.59 % among the aged group of 30 to 39 and ≥ 65 years respectively which was consider significant P<0.05. Increased BMI at 24.20±3.59 and 23.91±3.73 were independent predictors of hypertension in both male and female in addition to excessive alcoholism 76.7%, 56%, smoking 86%, 57% and diabetes 70% and 48.8% respectively with significant P<0.05.The prevalence of hypertension is 27.38% in Hunan China. The most important factors are smoking and diabetes in addition to alcohol consumption, high salt intake, which were responsible for increasing hypertension. Therefore, it is urgently required for prevention and control of hypertension.

Keywords: Prevalence, Hypertension, Smoking, Diabetes.

INTRODUCTION

Increased blood pressure (BP) is a one of the important causes for morbidity and mortality around the world. According to the global burden of disease (GBD) survey the raise systolic BP, smoking and faulty dietary habit may responsible for mortality and morbidity (E Gakidou et al., 2017). In china, the cardiovascular disease accounted for leading causes of death (He J et al.,2005), while hypertension recognized as a major risk factor for cardiovascular disease in china and as well as in world (wang L et al., 2005, China Encyclopedia 2005)

In past few decades, there was changed the prevalence of hypertension in china due to economic growth and urbanization, it has been widely reported from a national study of hypertension in 1991 with 950356 population and age range started from 15 years to more. This study recognized the prevalence of hypertension were 11.26% which were age adjusted around 94 million population (Xigui Wu 1195). In addition, another study shown in prevalence of hypertension in a Chinese adult population approximately 18.80% (China Encyclopedia 2005) according to Chinese Health and Nutrition Survey

in 2002, beside the study also determined the associated risk factors for hypertension such as overweight, obesity, type 2 diabetes, dyslipidemia and coronary artery disease which was found in 260 million Chinese people from 1992 to 2002 (Q weil et al., 2005, Wu Y 2006). Conversely, in European countries the prevalence of hypertension was in between 28% to 48%, and Mediterranean countries recognized around 20.00% and 30.00%, which was found from a study prevalence of adult population (wang L et al., 2005, China Encyclopedia 2005, Wu Y 2006). On the other hand, the adult people from North-East china shown their changed lifestyle and behaviors and as well as increasing dietary salt intake which were act as an individual risk factors for hypertension (Wu Y 2006).

However, previous study has a comparison of prevalence in between north and south region in china and shown an increased prevalence in north region because of higher body mass index (BMI), and high salt containing and recently, there was geographic variation the prevalence of hypertension due to lifestyle change in Chinese population (Yun Gao et al.,2013).

China National Diabetes and Metabolic Disorders Study were conducted from June 2007 through to May 2008 in Chinese adults aged 20 years and older and shown the prevalence of hypertension and its risk factors addition to Diabetes (Yang W, 2010). While alcohol consumption, high salt intake diet and less physical activity as an important risk factors for cardiovascular disease and among hypertension is a factor that leads to 35–40% of cardiovascular disease in Chinese adults [J Wang et al., 2014].

However, controlling hypertension may reduce the risk of cardiovascular disease. The current study investigated the prevalence of hypertension, which was in hospital based first Xiang Ya hospital located central south university in Hunan, China.

MATERIALS AND METHODS

This a retrospective study and it was conducted at the cardiac department of first Xiang Ya hospital central south university Human china to determine the prevalence of hypertension and associated risk factors in between January 2016 to December 2018 from hospital database records files. This is a single center study of both male and female patients who were diagnosed with hypertension and randomly selected a total number of 7,738 patients among them 2,119 patients were eligible criteria to include in this study. Current study collected the base line and clinical information of the patients such as age range in between 30 to ≥65 years, BMI, accurate records of blood pressure, a history of alcohol consumption, salt consumption, cigarette smoking and as well as diabetes. All the data were extracted from data sheet and analyzed by using SPSS 20.00 with the chi-square test. The significant of differences were considered at $P < 0.05$. This study was approved by the ethical committee of first Xiang Ya hospital, central south university, Hunan, China.

Statistical Analysis: Statistical analyses were performed by using SPSS 20.00 and chi square test. We present the percentages for different items, and mean, standard deviation and range for numerical variables. P value less than 0.05 was considered significant

RESULTS

Total two thousand one hundred nineteen hypertension patients among 1,187(56%) male and 932 (43.9 %) female were participated in this prevalence study. Results have shown the prevalence of hypertension was 27.38% in Table1. Shown the characteristic of the participants included with different age group among male and female which was in 30 to 39 years, 40 to 59 years and ≥65yrs. The results shown increased rate of prevalence of male 31.50% and female 26.28% in an aged group of 30 to 39 years which was considered as significant $P<0.001$. The prevalence of hypertension remains aged group such as 40 to 59 and ≥65 years have detected 34.79%, 33.69% and 34.12%, 39.59% in both male and female respectively. As in comparison, there were no significant in between male and female with the aged group in the years of 40 to 59. Besides our results shown the statistically significant in aged group≥65yrs of female than male and consider as $P<0.05$. In the male increased hypertension in aged between 30 to 39 years was found compared to female with same age group which was significant $P<0.05$. In the present study, the BMI of male and female were 23.91±3.73and 24.20±3.59 respectively which were no statistically significant. Table1. Shown the detail records of blood pressure (BP) level such as systolic blood pressure (SBP) and diastolic blood pressure (DBP), Mean diastolic BP was 88.00±14.99 for male and 81.763±12.82 for female. Mean systolic BP was 1133.50±21.33 for males and 127.36±23.15 for female.

Table1: Demographic characteristic of participants

Characteristic	Male (n=1187)%	Female (n=932)	P-value
Age group (%)			
30–39 (years)	374 (31.50)	245 (26.28)	P<0.05
40–59 (years)	413 (34.79)	318 (34.12)	NS
≥65- (years)	400 (33.69)	369 (39.59)	P<0.05
BMI	24.20±3.59	23.91±3.73	NS
Blood pressure (mean mmHg)mean			
SBP (mmHg)	133.50±21.33	127.36±23.15	P<0.05
DBP(mmHg)	88.00±14.99	81.763±12.82	P<0.05
HDL (mmol)	1.39±0.48	1.47±0.46	P<0.05
LDL (mmol)	3.04±0.6	3.02±0.7	NS
TG (mmol)	1.77±1.75	1.52±1.27	P<0.05
CHOL (mmol)	4.43±0.97	4.31±0.93	P<0.05
Fasting blood sugar (mmol)	5.19±1.38	4.97±1.33	P<0.05

Table 2: Associated risk factors for Hypertension

Variable	Male (n=1187)	Female (n=932)	P -value
Age (yrs)	45.68±12.9	46.53±11.6	P< 0.05
BMI (kg/m2)	24.20±3.59	23.91±3.73	NS
Alcohol	911 (76.7)	522 (56)	P<0.05
High salt intake	845 (71.1)	677 (72.6)	NS
Smoking	1022 (86)	532(57)	P<0.05
Diabetes	831 (70)	455(48.8)	P<0.05

There was no significant difference in prevalence between male and female.

Table 2, shown the association of risk factors with hypertension, such as diabetes, excessive alcohol consumption, high salt intake and smoking were significantly associated with hypertension in male compared to female ($p < 0.05$). The data shown diabetes, 70%, 48.8%, alcohol 76.7, 56%, high salt intake71.1%, 72.6% and smoking 86%, 56% in male and female respectively, but smoking was higher significant in between male and female with hypertension. The mean LDL value in male 3.04±0.6 and female 3.02±0.7 which was no significant differences between of them. Other remaining parameters such as TG, CHOL and FBS levels in male gender were remarkably higher than female gender, but HDL concentrations were more dominant in female subjects.

DISCUSSION

In the present study, we evaluated the prevalence of hypertension 27.38%, which was similar to other countries, while north and east china were higher prevalence compared to our rate. [8, 10] The National Health and Nutrition Examination Survey (NHANES) declared that increasing hypertension approximately 24.0% in 1988 to 1991 then subsequently extent to 33.5% from 2005 to 2008 in adults aged group (Yun Gao et al., 2013, Sushil K et al., 2012). However, in Chinese male subjects the prevalence of hypertension steady higher from 20.20% to 40.20% and 19.10% to 35.00% in female which was found same as in developed and higher than in some developing countries (Q weil et al., 2015, Roger VL et al.,2011, Pan W et al., 2001). An additional study reported in India, the prevalence of hypertension in male and female was 29.3-45.1% and 25.238.2% respectively , which was gradually raise from past 2 decades (WHO 2001, Wen J et al.,2012). On the other hand, the study on Chinese adult population in the Guangdong province and detected around 9.8 million has diagnosed hypertension (Wen J et al., 2012).

However, we found the hypertension in different aged group in both male and female such as 30 to 39, 40 to 59 and ≥65 years which were shown 31.50 %, 34.79% and 33.69% for male and

26.28%, 34.12% and 39.59% for female respectively. As well as, present study shown the hypertension 34.79% in male and 34.512% in female with the aged group of 40 to 49 and there was no found significant. Beside in male 31.50 %, which was higher than female 26.28% , with an aged group of 30 to 39 in addition to 33.69 % in male and 39.59% in female with the aged group ≥65 years that was considered as significant P<0.05 respectively. However, the study observed roughly 68% of women who has the aged between 35–44 years were suffering for hypertension (J wang et al., 2014)

Even as, the prevalence of hypertension found 24% and 17% in both male and female those aged 20 year and over in other country (Prashant R et al., 2012). Conversely, the study recognized on age specific hypertension of prevalence that was 17.40%, 28.20%, 40.70%, 47.30% and 10.70%, 26.80% 38.90%, 50.20% in both male and female respectively, which were similar to present study (Pan W et al., 2001). Moreover, we also detected the related of hypertension with BMI and found 24.20±3.59 which was higher in male compared to female 23.91±3.73,and it consider as significant P<0.05 and which was comparable to other studies (Mohan V et al.,2007, Yadav S et al.,2008).

In the present study shown increased the prevalence of isolated systolic and isolated diastolic hypertension as 133.50±21.33, 127.36±23.15% and 88.00±14.99, 81.763±12.82 respectively for both male and female, although, systolic and diastolic blood pressure is higher in male compared to female. Furthermore, there were several risk factors associated with hypertension which may possible lead to increase the prevalence. In the present study found some important risk factors such as diabetes, excessive alcohol and salt intake in addition to smoking. We found diabetes 70% in male and 48.8% in female and it was consider as significant P<0.05. However, increased insulin concentration may cause the less synthesize of low density lipoprotein (LDL) that lead to higher TG levels. We also found alcohol consumption 76.7% in male and 56% in female which may significantly related with prevalence of hypertension as P<0.05. Beside we found male excessive salt intake 71.1% and female 72.6% that enhance as a risk factors for hypertension but there was no found significant in between male and female with other studies that similar to reported (Malhotra P et al., 1999). Furthermore smoking was established as an associated risk factor with hypertension and shown male smoking 86% compared to female 57% which consider as P<0.05, even as same reported found in other studies (Yadav S et al.,2008, Malhotra P et al.,1999). In the present study found obesity, smoking, alcohol consumption and high salt intake which act as a individual important associated risk factor for both male and female for hypertension. It seems like that essential modify risk factors for hypertension that can be modify and as well as reduce and control the hypertension.

CONCLUSION

Currently hypertension considers as a major public health problem in china. This study detected that increasing prevalence of hypertension in Hunan, China due to smoking and diabetes, which act as individual risk factors in additional to others such as excessive alcohol consumption and high salt intake. Therefore, it is suggested the prevention of risk factors may contribute to control the hypertension.

Limitation: This study was single hospital based, further study requires to multiple hospitals and community based that may convenient to prevention and control of hypertension.

CONFLICT OF INTEREST

None.

ACKNOWLEGEMENT

I am very much thankful to the Central south university, first affiliated Xiangya hospital and specially thanks to professor Yang tian lun , Dr, Xia Ke and Dr. Li fei for their support during my research.

AUTHOR CONTRIBUTIONS

To obtain patients information's, data analysis and wrote the manuscript by the MS Ali Sheikh.

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