International Journal of Science and Healthcare Research
Vol.5; Issue: 4; Oct.-Dec. 2020
Website: ijshr.com
Original Research Article *ISSN: 2455-7587*

A Cross Sectional Survey to Determine the Prevalence and Associated Factors of Hypertension and Diabetes Mellitus among Urban Sikh Adults in Delhi

Harvinder Kaur[1], Sarita Ahwal[2], Rajlaxmi Nishant Kurian[3]

[1]Faculty, College of Nursing, Dr. Ram Manohar Lohia, Hospital, New Delhi,
[2]Assistant Professor, College of Nursing, Institute of Liver and Biliary Sciences, New Delhi
[3]Faculty, Rufaida College of Nursing, Jamia Hamdard, New Delhi

Corresponding Author: Sarita Ahwal

ABSTRACT

Using quantitative approach, a cross sectional survey was conducted at Rakab Ganj Sahib Gurudwara, New Delhi to assess the prevalence of DM & HTN among Urban Sikh adults in Delhi. The health check-ups were conducted for 500 Sikh adults. Thirty eight percentage of the participants were found to have hypertension and 54 % had Diabetes Mellitus (DM). Obesity was prevalent among 48.8% of the participants. The study recommends that measures should be taken to prevent these prevailing conditions among this particular group of community.

Keywords: Hypertension, Diabetes Mellitus, CVD Risk factors, Prevalence, obesity in Adults, Delhi.

INTRODUCTION

Hypertension (HTN) and Diabetes Mellitus (DM) are among the major modifiable risk factors for cardiovascular diseases. Diabetes and hypertension are closely interlinked because of similar risk factors, such as endothelial dysfunction, vascular inflammation, arterial remodelling, atherosclerosis, dyslipidemia, and obesity.[1] Fighting against these two prevalent comorbidities has become a global issue.

According to International Diabetes Federation estimates, globally around 8.8% of the adult population has diabetes in 2017 that includes approximately 425 million people. Diabetes is among the top 10 causes of death globally and together with the other three major non communicable diseases (NCDs) account for over 80% of all premature NCD deaths.[2]

The burden of diabetes drains national healthcare budgets, reduces productivity and slows economic growth. Globally diabetes results in USD 727 billion being spent yearly by people with diabetes only on healthcare, which corresponds to one for every eight dollars spent on healthcare.[2] The prevalence of type 2 diabetes (T2D) continues to rise worldwide as lifestyles associated with low energy expenditure and high caloric intake are increasingly adopted, particularly in lower-income and developing countries. It is predicted that the number of cases of T2D will rise from 415 million to 642 million by 2040.[3]

Although only one-third (33.3%) of adults in South-East Asia (SEA) live in urban areas in 2017, nearly half (48.8%) of all adults with diabetes can be found in cities. India is home to the second largest number of adults living with diabetes worldwide, after China with a prevalence of 10.4%. In 2017, India is the largest contributor to the regional mortality, with nearly one million estimated deaths attributable to diabetes.[4]

In 2010, hypertension was among the three leading risk factors for global disease burden with 7•0% of global DALYs in South Asia. Other two included tobacco smoking including second-hand smoke (6•3%), and alcohol use (5•5%). [5] Hypertension (HTN) exerts a substantial public health burden on cardiovascular health status and healthcare systems in India.[6] In an analysis of worldwide data for the global burden of HTN, 20.6% of Indian men and 20.9% of Indian women were suffering from HTN in 2005.[7]

The WHO rates HTN as one of the most important causes of premature death worldwide (World Health Organisation, 2019). The pooled prevalence of HTN for the rural and urban north Indian population was 14.5% (13.3–15.7) and 28.8% (26.9–30.8), respectively.[8]

Two-fold increase in risk for HTN among Indians when they smoked, orally consumed khaini and tobacco, had extra salt intake in their food, had a sedentary lifestyle, were centrally obese , had BMI at least 25 , and consumed alcohol. [8]

Obesity is a major public health problem in the United States that affects 35% of adults and is responsible for more than 100,000 deaths annually.[9] The obesity epidemic is thought by many to be partly due to changes in the human environment that make it easier to eat more and exercise less.[10] Additionally, obesity is associated with chronic diseases that increase rates of morbidity and mortality, including type 2 diabetes, cardiovascular disease, stroke, hypertension, and certain types of cancer.[11]

Extensive working hours not only intrude into their personal life but tend to acquire maladaptive behaviours like drinking alcohol, smoking and overeating contributing significantly to their deterioration. Prolonged working hours, irregular eating habits, inadequate sleep or sleepless nights, transferable jobs, shifting duties and disturbed home life contributes to mounting stress in the police officer's life. This results in vulnerability towards various diseases such as hypertension, diabetes, obesity, joint pains, paralytic strokes and heart attacks. [12]

Against this background, an understanding of the changing epidemiology of diabetes in India is required. Estimation of the prevalence of diabetes and identification of high risk groups is essential for planning of community based risk factor reduction interventions. This study targets a particular group of community (Sikh) to help understand if they are at risk.

MATERIALS AND METHODS

Quantitative research approach was adopted for the study. A descriptive cross sectional survey was conducted to assess the prevalence and risk factors related to HTN and DM among the urban Sikh adults. The study was conducted at Rakab Ganj Sahib Gurudwara, New Delhi on 5th January, 2019. For the collection of data, a formal administrative permission was sought from the concerned authority of the Gurudwara.

A structured questionnaire developed by the researcher was used to collect data. The tool included information related to socio demographic and clinical profile of the participants. The questionnaire also included questions regarding the risk factors for HTN and DM including family history of HTN and/or DM, intake of alcohol, tobacco smoking, type of diet, intake of fruits and vegetables, level of physical activity. Additionally, it included anthropometric parameters such as height, weight, BMI. The content validity of the tool was established in congruence with the agreement of seven experts. The content validity index was found to be 0.92. A trained team of health workers were involved in data collection. To establish the inter-rater reliability of the tool, the Cohen's Kappa value was calculated to be 0.87.

As a part of data collection, a health screening camp was organised by the team of health care workers including doctors, nursing officers and lab technicians from Ram Manohar Lohia Hospital, New Delhi. The population for the study comprised of adult visitors of more than 18 years of age at

the Rakab Ganj Sahib Gurudwara. Using purposive sampling technique, 500 adult were included as participants after taking their consent. The respondents were explained about the purpose of the study and assured the confidentiality of their responses.

After obtaining the permission, the structured questionnaire was administered to the sample. The health workers team also performed health check-ups including anthropometric measurements, blood pressure and random blood sugar for all the study participants. The instruments used were calibrated and checked for their accuracy. The average time taken for each subject was 20 minutes. After collecting the data, all the participants were given an information booklet which was developed by the researchers after an extensive review of literature. The content of the booklet included definition, incidence and prevalence, risk factors, related complications, prevention and management of HTN and DM. The content validity index of the booklet was established to be 0.96. The participants who were screened to have abnormal findings were counselled and were referred to RML hospital or their nearby hospitals for further check-ups and interventions.

STATISTICAL METHODS

The data was analysed using descriptive and inferential statistics using SPSS V.20. The Kolmogorov-Smirnov test was used to determine that the data is normally distributes and hence parametric tests were used to analyse the data.

RESULT AND DISCUSSION

The findings related to the socio demographic profile showed that more than half of the subjects (54.6%) aged more than 50 years. A comparatively low proportion (13.6%) of the subjects belonged to an age group of below30 years. Mean age of the subjects was 53.07±4.36 years. Sixty percent of them were males and rest 40 per cent were females. Most of the subjects were married (92.4%).

Table1. Frequency and percentage distribution of Blood pressure, Random Blood Sugar and Body mass index as per their range based categories.

Variables	Categories	Frequency (f)	Percentage (%)
Blood pressure	Normal BP <120/80 mm Hg	117	23.4
	Pre hypertension Systolic between 120-129 and diastolic less than 80	193	38.6
	Hypertension Systolic between <130 and/or Diastolic between <80	190	38.0
Random Blood Sugar(RBS)	Normal Between 80–140mg/dl	342	68.4
	Pre diabetic Between 140-200mg/dl	104	20.8
	Diabetic RBS ≥ 200 mg/dl	54	10.8
Body mass index (BMI)	Underweight BMI <18.5 kg/m^2	26	5.2
	Normal Between 18.5–22.9 kg/m^2	126	25.2
	Overweight Between 23.0 –24.9 kg/m^2	104	20.8
	Obesity BMI ≥25 kg/m^2	244	48.8

As shown in Table 1. Large percentage of the subjects belonged to either pre-hypertensive (38.6%) or hypertensive (38%) group. Only 23.4 percentages of the participants had normal Blood pressure. Hence, it can be interpreted that more than three fourth (76.6%) of the participants had above normal blood pressure. The results were in congruence with the study done by Chaturvedi, Pant & Yadav [13], where they found that the prevalence of hypertension was 63.8% and isolated systolic

hypertension (ISH) was found in 15.3% of the subjects. Similar were the results of systematic review done by Gupta, Gaur & S. Ram [14], who reported that the overall estimated prevalence for hypertension in India was 29.8% [95% confidence interval (CI) 26.7–33.0].

In reference to the random blood sugar (RBS) findings, 68.4 percentages of the subjects had normal sugar levels while approximately 21percentages were pre-diabetic and 11 percentages were diabetic. The results were similar to the findings of a study one in north India by Tripathy et al. [15] ,where the overall prevalence of DM among the study participants was found out to be 8.3% (95% CI 7.3–9.4%).

Only one quarter of the subjects (25%) had normal weight whereas around 70% had weight above normal range. Approximately half of the subjects (48.8%) were found to be obese. Five percentages had weight below normal range.

Approximately half of the subjects (52.2%) had a positive family history of hypertension/diabetes/stroke/heart diseases. Approximately 10 % of the participants had current history of tobacco consumption (either smoking and/or chewing) and almost an equal percentage (9.3%) was found to have history of alcohol consumption in past seven days. More than one fourth (28%) of them usually spent more than 8 hours sitting or reclining on a typical day. More than half of the participants were found to have history of eating junk food items more than thrice a week whereas only 34.4% had history of daily intake of fruits and vegetables. Only one fourth of the participants (27.4) used to engage them in moderate to vigorous-intensity activity that caused increase in breathing or heart rate for at least 10 minutes continuously.

As shown in table 2. there was no association found between BMI and RBS (r=.067, p=0.134). BMI was found to have significant association with the gender as well as marital status. BMI was significantly higher in married adults and Females. This finding is similar to the findings of a number of researches done to find association between obesity and marital status (Jeffery & Utter, 2003 and Schafer, 2003).Marital status and marital history are found to be associated with health.[16] The prevalence of overweight was two folds higher in married men (OR: 2.24; 95% CI: 2.08 – 2.41) and women (OR: 2.36; 95% CI: 2.20 – 2.53) than never-married men and women.[17]

Table2. Association of BMI, RBS, systolic Blood Pressure and Diastolic Blood Pressure with the selected demographic variables

Variables	BMI (kg/m^2) (Mean±SD)	RBS (mg/dl)	Systolic blood pressure (mm Hg)	Diastolic blood pressure (mm Hg)
Age groups 20-30 Years	28.06±2.27	-	156.67±20.817	100.00±10.00
31-40 Years	29.13±3.49	346.67±87.04	144.62±6.39	95.23±8.89
41-50 Years	28.51±3.01	293.08±90.66	151.35±13.99	93.68±8.82
51-60 Years	28.80±2.82	294.89±78.33	149.42±11.45	92.23±11.89
Above 60 Years	28.58±2.77	267.95±54.30	149.90±11.85	88.43±9.14
p value	0.734	0.481	0.409	0.009**
Gender Male	27.86 ±2.65	281.59±78.09	150.62±11.23	91.22±9.76
Female	29.61 ± 2.78	294.59± 98.76	148.27±8.97	90.56±10.89
p value	<0.0001***	0.601	0.194	0.668
Marital status Married	28.73±2.65	283.62± 76.56	149.79±9.78	90.78± 11.24
Unmarried	26.44±1.34	372.00±98.87	148.40±11.23	98.00± 9.67
p value	0.041*	0.169	0.799	0.821

**p< 0.05, **p<0.001, ***p<0.0001*

Diastolic blood pressure was found to be significantly associated with the age groups as shown in table 2. Further post hoc analysis using Bonferroni Correction was used to assess the direction of association which showed that adults between 20-30 years of age were found to have significantly higher diastolic blood pressure as compared to the older adults between 41-50 years. Similar results were reported by Sanjay Kini et al.[18] , where the prevalence of pre-hypertension among young adults

(20–30 years) was found to be high (45.2%). BMI, RBS and systolic blood pressure had no association with the age of the participants. Among other risk factors, significant association was found between hypertension and obesity. Similar results were documented by Rachel Hajar.[19] He reported that obesity is associated with comorbidities such as CHD, type 2 diabetes, hypertension, and sleep apnea.

CONCLUSION

During the screening, majority of the Urban Sikh adults (76.6%) were found to have above normal blood pressure whereas in terms of random blood sugar levels, around one third (31.6%) had abnormal blood sugar levels. The present study recommends frequent health screening for the adults belonging to this particular community so as to take earliest measures to prevent development of related complications. Early screening and detection of adults may yield positive health outcomes in society.

REFERENCES

1. Petrie J, GuzikT, Touyz R. Diabetes, Hypertension, and Cardiovascular Disease: Clinical Insights and Vascular Mechanisms. Canadian Journal Of Cardiology. 2018; 34(5): 575-584. doi: 10.1016/j.cjca.2017.12.005.
2. IDF Diabetes Atlas Group. (2015). Update of mortality attributable to diabetes for the IDF Diabetes Atlas: Estimates for the year 2013. Diabetes Research And Clinical Practice, 109(3), 461-465. doi: 10.1016/j.diabres.2015.05.037.
3. Ogurtsova K, da Rocha Fernandes J, HuangY, et al. IDF Diabetes Atlas: Global estimates for the prevalence of diabetes for 2015 and 2040. Diabetes Research And Clinical Practice. 2017; 128: 40-50.
4. Saeedi P, Petersohn I, Salpea P,et al. Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the International Diabetes Federation Diabetes Atlas, 9th edition. Diabetes Research And Clinical Practice. 2019; 157.
5. The burden of disease: Global burden of disease and injury attributable to selected risk factors, 1990. (2002). BMJ, 325(7370), 928-928. doi: 10.1136/bmj.325.7370.928.
6. Srinath Reddy, K Shah, B Varghese, et al. Responding to the threat of chronic diseases in India. The Lancet.2005; 366(9498), 1744-1749.
7. Kearney P, Whelton M, Reynolds K, Muntner P, et al. Global burden of hypertension: analysis of worldwide data. The Lancet. 2005; 365(9455), 217-223. doi: 10.1016/s0140-6736(05)17741-1.
8. Anchala R, Kannuri N, Pant H, et al. Hypertension in India. Journal Of Hypertension. 2017; 32(6), 1170-1177.
9. Flegal, K. Excess Deaths Associated With Underweight, Overweight, and Obesity. JAMA. 2005; 293(15).
10. Jeffery, R., & Utter, J. The Changing Environment and Population Obesity in the United States. Obesity Research. 2003; 11(S10), 12S-22S.
11. Flegal K, Graubard B, Williamson D, et al. Cause-Specific Excess Deaths Associated With Underweight, Overweight, and Obesity. JAMA. 2007; 298(17), 2028.
12. Bhatia K. Prevalence of Chronic Morbidity and Sociodemographic Profile of Police Personnel – A Study from Gujarat. Journal of clinical and diagnostic research. 2017;doi: 10.7860/jcdr/2017/27435.10586.
13. Chaturvedi S, Pant M, &Yadav G. Hypertension in Delhi: prevalence, awareness, treatment and control. Tropical Docto. 2003; 37(3), 142-145.
14. Gupta R, Gaur K, & S RamC. Emerging trends in hypertension epidemiology in India. Journal Of Human Hypertension.2018; 33(8), 575-587.
15. TripathyJ, Thakur J, Jeet G et al.Prevalence and risk factors of diabetes in a large community-based study in North India: results from a STEPS survey in Punjab, India. Diabetology& Metabolic Syndrome, 2017; 9(1). doi: 10.1186/s13098-017-0207-3.

16. Sobal J, & Hanson K. Marital Status, Marital History, Body Weight, and Obesity. Marriage & Family Review. 2011; 47(7), 474-504.
17. Janghorbani M, Amini M, Gouya M et al. Gender Differential in the Association of Body Mass Index and Abdominal Obesity with Prehypertension and Hypertension in Iranian Adults. Nature Precedings. 2008; doi: 10.1038/npre.2008.1829.1
18. Kini S, KamathV, Kulkarni M et al. Pre-Hypertension among Young Adults (20–30 Years) in Coastal Villages of Udupi District in Southern India: An Alarming Scenario. PLOS ONE. 2011; 11(4). doi: 10.1371/journal.pone.0154538.
19. Hajar R. Risk Factors for Coronary Artery Disease: Historical Perspectives. Heart views : the official journal of the Gulf Heart Association.2017; 18(3), 109–114.

How to cite this article: Kaur H, Ahwal S, Kurian RN. A cross sectional survey to determine the prevalence and associated factors of hypertension and diabetes mellitus among Urban Sikh adults in Delhi. *International Journal of Science & Healthcare Research.* 2020; 5(4): 275-280.

******