

ORIGINAL RESEARCH

Evaluation of Prevalence of hypertension in type 2 DM patients

Dr. Jayesh Sharma

Assistant Professor, Department of General Medicine, N C Medical College & Hospital, Panipat, Haryana, India

Corresponding Author

Dr. Jayesh Sharma

Assistant Professor, Department of General Medicine, N C Medical College & Hospital, Panipat, Haryana, India

Received: 13 December, 2021

Accepted: 10 January, 2022

ABSTRACT

Background: The present study was conducted for assessing the prevalence of hypertension in type 2 DM patients. **Materials & methods:** One hundred participants with type 2 diabetes were included in the study. All of the patients' complete demographic information was acquired. All patients had blood samples taken, which were then submitted to a lab to document each patient's glycemic and biochemical profiles. Three days in a row, all of the patients were summoned back, and blood pressure was taken. The final value was determined by taking the mean of the three measurements. The prevalence of high blood pressure was noted. Every outcome was entered into a Microsoft Excel spreadsheet and then statistical analysis was performed with SPSS software. **Results:** A total of 500 type 2 diabetic patients were analyzed. mean age of the patients was 43.1 years. Among these 500 patients, 291 were males while the remaining were females. Hypertension was seen in 238 patients. Hence; the overall prevalence of hypertension was 47.6 percent of the patients. Significant results were obtained while correlating the HbA1c levels with occurrence of hypertension. **Conclusion:** There is a relationship between diabetes and hypertension. To reduce the morbidity linked to the condition, close observation of the risk factors for hypertension and diabetes is necessary.

Key words: Hypertension, Diabetes

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution- Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

Diabetes mellitus (DM), also known simply as diabetes is a complex metabolic disorder characterized by hyperglycemia, a physiologically abnormal condition represented by continued elevated blood glucose levels. Hyperglycemia results from anomalies in either insulin secretion or insulin action or both and manifests in a chronic and heterogeneous manner as carbohydrate, fat, and protein metabolic dysfunctions. Diabetes follows a progressive pattern with complex pathogenesis and varied presentation. Hyperglycemia and its associated carbohydrate, fat, and protein metabolic dysfunctions affect multiple organs of the body and disrupt their normal functioning.¹⁻³ Hypertension is both a disease and a major risk factor for other diseases. Population studies show an increasing rate of cardiovascular events such as stroke, myocardial infarction, heart failure, atrial fibrillation and premature mortality, with increasing blood pressure (from systolic blood pressures ≥ 115 mmHg). This relationship is exponential, and stronger for systolic pressure than for diastolic pressure. Untreated very high (>180/110 mmHg) or rapidly rising blood pressure (such as in eclampsia) can overcome normal microvascular autoregulation. This leads to acute damage in the microcirculation and

results in a multisystem clinical syndrome of accelerated or malignant hypertension, or cerebral haemorrhage, which are immediate threats to life.⁴⁻⁶ The present study was conducted for assessing the prevalence of hypertension in type 2 DM patients.

MATERIALS & METHODS

The present study was conducted for assessing the prevalence of hypertension in type 2 DM patients. Five hundred participants with type 2 diabetes were included in the study. All of the patients' complete demographic information was acquired. All patients had blood samples taken, which were then submitted to a lab to document each patient's glycemic and biochemical profiles. Three days in a row, all of the patients were summoned back, and blood pressure was taken. The final value was determined by taking the mean of the three measurements. The prevalence of high blood pressure was noted. Every outcome was entered into a Microsoft Excel spreadsheet and then statistical analysis was performed with SPSS software.

RESULTS

A total of 500 type 2 diabetic patients were analyzed. mean age of the patients was 43.1 years. Among these

500 patients, 291 were males while the remaining were females. Hypertension was seen in 238 patients. Hence; the overall prevalence of hypertension was 47.6 percent of the patients. Significant results were obtained while correlating the HbA1c levels with occurrence of hypertension.

Table 1: Prevalence of hypertension

Hypertension	Number	Percentage
Present	238	47.6
Absent	262	52.4
Total	100	100

Table 2: Correlation of occurrence of hypertension with glyemic profile

Hypertension	Mean HbA1c levels	p-value
Present	12.1	0.000 (Significant)
Absent	10.1	

DISCUSSION

Diabetes mellitus is a serious metabolic disease, affecting people of all geographic, ethnic or racial origin and its prevalence is increasing globally. Burden from this costly disease is high on the low and middle income countries (LMIC) where the impacts of modernization and urbanization have caused marked adverse changes in lifestyle parameters. Type 2 diabetes which accounts for 85-95 per cent of all diabetes has a latent, asymptomatic period of sub-clinical stages which often remains undiagnosed for several years. As a result, in many patients the vascular complications are already present at the time of diagnosis of diabetes, which is often detected by an opportunistic testing. Asian populations in general, particularly Asian Indians have a high risk of developing diabetes at a younger age when compared with the western populations. Therefore, it is essential that efforts are made to diagnose diabetes early so that the long term sufferings by the patients and the societal burden can be considerably mitigated.⁷⁻⁹

Hypertension is the leading preventable risk factor for cardiovascular disease (CVD) and all-cause mortality worldwide. In 2010, 31.1% of the global adult population (1.39 billion people) had hypertension, defined as systolic BP \geq 140 mmHg and/or diastolic BP \geq 90 mmHg. The prevalence of hypertension is rising globally owing to ageing of the population and increases in exposure to lifestyle risk factors including unhealthy diets (i.e. high sodium and low potassium intake and lack of physical activity). However, changes in hypertension prevalence are not uniform worldwide. In the past two decades, high-income countries (HICs) experienced a modest decrease in hypertension prevalence, while low and middle-income countries (LMICs) experienced significant increases. These disparities in hypertension prevalence trends suggest that health care systems in LMICs could be facing a rapidly increasing burden of hypertension and BP-related cardiovascular diseases,

in some cases in addition to a substantial burden of infectious diseases.¹⁰⁻¹² The present study was conducted for assessing the prevalence of hypertension in type 2 DM patients.

A total of 500 type 2 diabetic patients were analyzed. mean age of the patients was 43.1 years. Among these 500 patients, 291 were males while the remaining were females. Hypertension was seen in 238 patients. Hence; the overall prevalence of hypertension was 47.6 percent of the patients. Significant results were obtained while correlating the HbA1c levels with occurrence of hypertension. Kapil, U et al assessed the incidence of hypertension among diabetic patients. A list of all villages with their population in the district was developed. From this list, 30 villages were identified using population proportionate to size sampling method. From each village, 30 geriatric subjects were selected. A total of 1003 geriatric subjects age 60 years and above were included in the study. Data were collected on sociodemographic profile, blood pressure, fasting blood glucose, anthropometry, and lipid profile from all the enrolled subjects. The prevalence of HTN and DM was assessed. Univariate and multivariate analyses were done to identify risk factors associated with HTN and DM. The prevalence of HTN and DM was found to be 54.5% and 14.6%, respectively. For HTN, advancing age, high educational level and body mass index (BMI) (\geq 25 kg/m²) and for DM higher education level and BMI (\geq 25 kg/m²) were found to be significant risk factors. A high prevalence of HTN and DM was found in geriatric population residing in rural area.¹³ Mubarak, F et al assessed the prevalence of hypertension, risk factors, and the level of awareness and control of hypertension among outpatients with type 2 diabetes. A cross-sectional study was carried out on a sample of 1000 patients with type 2 diabetes. Data were collected from medical records and through a structured interview questionnaire. Logistic regression analysis was used to assess the independent effect of variables on hypertension. The prevalence of hypertension (BP $>$ 130/80 or on medication for high blood pressure) was 72.4% (70.9% of males and 73.9% of females). The logistic regression indicated that hypertension was positively associated with age (P=.001), body mass index (P=.001), and duration of diabetes (P=.001). About one-half of patients who were aware of having hypertension failed to keep their blood pressure under control. Hypertension is a common co-morbidity among diabetic patients.¹⁴ Kilonzo, S. B et al determined the prevalence and factors associated with poor hypertension control in these patients. The majority of our study population were females, 161/295 (54.6%), and the median age was 57 years (IQR 50–64). The prevalence of hypertension was 206/295 (69.8%). A total of 174/206 (84.5%) patients had uncontrolled hypertension. This poor control was significantly associated with poor adherence to anti-hypertensives (OR 1.73[1.26–2.38] p=0.002), presence of any long-term complication

(OR 3.19 [1.65–6.18] $p=0.03$) and overweight (BMI>24.9 Vs <24.9) (OR 1.68 [0.98–2.88], $p=0.04$). Under-prescription and ambiguous drugs combination was also observed. The prevalence of poor hypertension control among diabetic patients is alarming.¹⁵

CONCLUSION

There is a relationship between diabetes and hypertension. To reduce the morbidity linked to the condition, close observation of the risk factors for hypertension and diabetes is necessary.

REFERENCES

1. Rawshani A, Rawshani A, Franzén S, Eliasson B, Svensson AM, Miftaraj M, et al. Mortality and cardiovascular disease in type 1 and type 2 diabetes. *N Engl J Med.* 2017;376:1407–18.
2. Saeedi P, Petersohn I, Salpea P, Malanda B, Karuranga S, Unwin N, et al. IDF Diabetes Atlas Committee. Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the international diabetes federation diabetes atlas. *Diabetes Res Clin Pract.* (9th edition) 2019;157:107843.
3. Knip M, Siljander H. Autoimmune mechanisms in type 1 diabetes. *Autoimmun Rev.* 2008;7:550–7.
4. National Institute for Health and Care Excellence. Hypertension in adults: diagnosis and management. NICE guideline [NG136]. London: NICE; 2019. <https://www.nice.org.uk/guidance/ng136> [cited 2020 Aug 1]
5. Veterans Administration Cooperative Study Group on antihypertensive agents. Effects of treatment on morbidity in hypertension. Results in patients with diastolic blood pressures averaging 115 through 129 mm Hg. *JAMA* 1967;202:1028-34.
6. Sundström J, Arima H, Jackson R, Turnbull F, Rahimi K, Chalmers J, et al. Blood Pressure Lowering Treatment Trialists' Collaboration Effects of blood pressure reduction in mild hypertension: a systematic review and meta-analysis. *Ann Intern Med* 2015;162:184-91.
7. Murugesan N, Snehalatha C, Shobhana R, Roglic G, Ramachandran A. Awareness about diabetes and its complications in the general and diabetic population in a city in southern India. *Diabetes Res Clin Pract.* 2007;77:433–7.
8. Mohan D, Raj D, Shanthirani CS, Datta M, Unwin NC, Kapur A, et al. Awareness and knowledge of diabetes in Chennai - the Chennai urban rural epidemiology study (CURES-9) *J Assoc Physicians India.* 2005;53:283–7.
9. Ramachandran A, Snehalatha C, Vijay V, Wareham NJ, Colagiuri S. Derivation and validation of diabetes risk score for urban Asian Indians. *Diabetes Res Clin Pract.* 2005;70:63–70.
10. Ishikawa K, Ohta T, Zhang J, Hashimoto S & Tanaka H Influence of age and gender on exercise training-induced blood pressure reduction in systemic hypertension. *Am. J. Cardiol* 84, 192–196 (1999).
11. Kelley GA & Kelley KS Progressive resistance exercise and resting blood pressure : A meta-analysis of randomized controlled trials. *Hypertens.* (Dallas, Tex. 1979) 35, 838–43 (2000).
12. NCD Risk Factor Collaboration (NCD-RisC). Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19.2 million participants. *Lancet* 387, 1377–1396 (2016).
13. Kapil, U., Khandelwal, R., Ramakrishnan, L., Khenduja, P., Gupta, A., Pandey, R. M., Upadhyay, A. D., & Belwal, R. S. (2018). Prevalence of hypertension, diabetes, and associated risk factors among geriatric population living in a high-altitude region of rural Uttarakhand, India. *Journal of family medicine and primary care*, 7(6), 1527–1536. https://doi.org/10.4103/jfmpc.jfmpc_108_18
14. Mubarak, F. M., Froelicher, E. S., Jaddou, H. Y., & Ajlouni, K. M. (2008). Hypertension among 1000 patients with type 2 diabetes attending a national diabetes center in Jordan. *Annals of Saudi medicine*, 28(5), 346–351. <https://doi.org/10.5144/0256-4947.2008.346>
15. Kilonzo, S. B., Gunda, D. W., Bakshi, F. A., Kalokola, F., Mayala, H. A., & Dadi, H. (2017). Control of Hypertension among Diabetic Patients in a Referral Hospital in Tanzania: A Cross-Sectional Study. *Ethiopian journal of health sciences*, 27(5), 473–480. <https://doi.org/10.4314/ejhs.v27i5.5>