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## *Frequency of hypertension in diabetic patients in District Dera Ghazi Khan*

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### Abstract

Hypertension is one of most common health problems. According to W.H.O reports almost more than 42 million people throughout the world are suffering from this disease and is increasing day by day. Total 500 male patients hospitalized in different hospitals of Dera ghazi khan district were selected, for which, a concise study designed Performa was prepared to collect the history and data of the patients. A number of parameters such as cholesterol level, serum sodium (Na<sup>+</sup>) level, abnormality of proteinuria and Hypercholesterolemia were studied to characterize the possible reasons of hypertension in diabetic patients. It has been observed that the prevalence of hypertension was significantly higher in those patients suffering from diabetes. Of the total 500 patients, 399 (67.8%) had hypertension. Out of the total 339 hypertensive patients, 187 (55.16%) were found possessing raised cholesterol level, 179 (52.8%) possessed raised Na<sup>+</sup> level, 172 (50.7%) possessed raised K<sup>+</sup> level and 159 (46.9%) patients were with proteinuria problems. In our study it was confirmed that higher sodium level, abnormal cholesterol level and the presence of proteinuria were strongly linked to the developing hypertension in diabetics. Therefore we concluded from this study that diabetes and hypertension occur together.

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*Keywords: Proteinuria, Hypertension, hypercholesterolemia*

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### Introduction

High blood pressure is a common condition in which the long-term force of the blood toward the artery walls is high enough that it can cause health issues, like heart disease [1]. High blood pressure may be either primary high blood pressure or secondary high blood pressure. About 90–95% of cases are primary, defined as high blood pressure due to nonspecific lifestyle and genetic factors. The remaining 5-10% of cases is as secondary high blood pressure due to an identifiable cause, such as chronic kidney disease, narrowing of the kidney arteries, an endocrine disorder [2].

### OBJECTIVES

1. To study the issue of hypertension in diabetic patients.
2. To study the prevalence and its probable factors leading to hypertension in patients suffering from diabetes.

### Materials and methods

All the parameters were determined through commercially available kit by taking blood from the patients, from which, serum was extracted.

Hypertension was diagnosed when systolic blood pressure >140 mmHg and diastolic blood pressure > 90 mmHg or more than two readings. Following parameters were considered for the study

1. Hypercholesterolemia
2. Sodium Level
3. Potassium Level
4. Proteinuria
5. Measurement of blood pressure

### Results and discussion

It was observed that most of the patients with Diabetes were suffering from Hypertension at the same time. 339 patients out of 500 were having High Blood Pressure. It means 68% patients were diagnosed as Hypertensive.

**Table 1:** Frequency of hypertension in diabetics

Examined	Positive for Hypertension	% age
Hypertension	339	67.8
Non-Hypertension	161	32.2

**Table 2:** Hypercholesterolemia as linked factor for the development of hypertension

	Examined	Positive for Hypercholesterolemia	% age
Hypertension	339	187	55.16
Non-Hypertension	161	59	36.6

Out of the total 339 hypertensive patients, 187 (55.16%) were found possessing raised cholesterol level.

**Table 3:** Na<sup>+</sup> level as related factor for the development of hypertension

	Examined	High Na <sup>+</sup> Level	% age
Hypertension	339	179	52.8
Non Hypertension	161	78	48.8

Out of the total 339 hypertensive patients, 179 (52.8%) possessed raised Na<sup>+</sup> level.

**Table 4:** K<sup>+</sup> level as an associated factor for the development of hypertension

	Examined	High K <sup>+</sup> Level	% age
Hypertension	339	172	50.7
Non Hypertension	161	64	39.7

Out of the total 339 hypertensive patients, 172 (50.7%) possessed raised K<sup>+</sup> level.

**Table 5:** Proteinuria a connected factor for Hypertension

	Examined	High Proteinuria Level	% age
Hypertension	339	159	46.9
Non Hypertension	161	57	35.4

Out of the total 339 hypertensive patients, 159 (46.9%) patients were with proteinuria problems.

**Fig 1:** Hypertensive patients

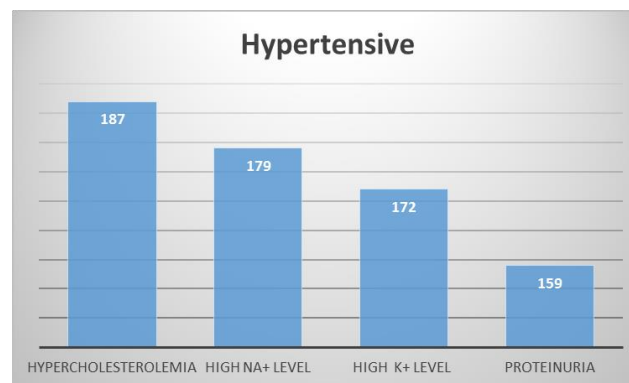
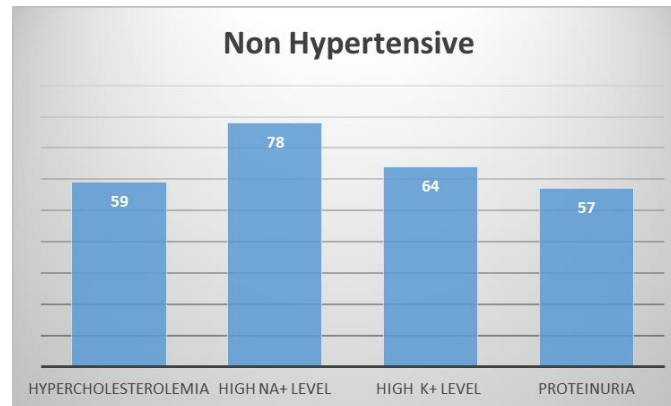


Figure 1 shows number of Patients who were diagnosed hypertensive and having high/abnormal levels of other parameters like Cholesterol, Blood Sodium, Blood Potassium and Proteinuria. So, out of 500 patients, 339 were diagnosed Hypertensive. 187 out of 339 patients were having High blood cholesterol level or Hypercholesterolemia, 179 out of 339 patients were having high Sodium level or Hyponatremia. 172 patients out of 339 were having high Potassium level or Hyperkalemia. 159 patients out of 339 were having raised Proteinuria level.

Figure 2 shows number of Patients who were not diagnosed hypertensive, means they were not having High blood pressure but they are having high/abnormal level of other parameters like Cholesterol, Blood Sodium, Blood Potassium and Proteinuria. So, 59 out of 161 patients were having High blood cholesterol level or Hypercholesterolemia, 78 out of 161 patients was having high Sodium level or Hyponatremia. 64 patients out of 161 were having high Potassium level or Hyperkalemia. 57 patients out of 161 were having raised Proteinuria level.

**Fig 2: Non Hypertensive patients**



Hypertension is one of the main causative agents of cardiac failure, heart abnormalities, peripheral arterial dysfunctions and stroke diseases. It has been one of the risk factors of kidney abnormalities. Elevation of blood pressure even at low level may lead to shortening of life. [4]. We addressed the issue of hypertension in diabetic patients with the objectives to look into the prevalence and its probable factors leading to hypertension in patients suffering from diabetes. We found that out of 500 patients, 399 (67.8%) were having hypertension (Table.1). As reported earlier, the relationship between high cholesterol level and high blood pressure as one of the significant factors in diabetic patients. We found almost the same that in more than 55% of the cases, there was high serum cholesterol level above normal plus high blood pressure in diabetic patients (Table 2). Earlier report show that food possessing sodium salt or taking in salt in diet is one of the risk factors leading to high blood pressure and inducing hypertension as well. Our studies in this respect showed that higher sodium level above the normal was a vital factor in inducing hypertension as more than 52% of the cases was having high sodium level (Table3). Regarding the proteinuria as a possible sign and indicator of hypertension, it has been shown in a number of reports that proteinuria is one of the major contributors in inducing high blood pressure in diabetes [3].

In our study we found that more than 46% of diabetic patients were having high proteinuria, thus showing to one of the main inducing agents of hypertension in diabetes (Table 4). Earlier reports have shown the co-existence of hypertension and diabetes that may lead to a number of physiological disorders such as impairment in regulating the flow of blood throughout the body. [4-5]. Here we found the same results as the prevalence of hypertension was significantly higher in diabetic patients (67.8%).

## Conclusion


We concluded from this research work that there is very significant relationship between hypertension and diabetes, showing that the two disorders frequently coexist together, may be because of genetic basis, epigenetic linkage or due to certain physico-chemical association.

## Conflict of Interest

We declare that we have no conflict of interest.

## References

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