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Association of Cardiovascular Complications and Gall Stone are Higher among Diabetics' - A Comparative Study

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Abstract: ***Background: "Diabetes" is a condition in which the body's ability to convert glucose (sugar) to energy is impaired. Symptoms include frequent urination, excessive thirst, increased hunger, weight loss etc. Risk factors may include family history of diabetes, overweight, unhealthy diet, physical inactivity etc. Complications of diabetes include gallstone, hypertension, obesity, etc. Treatments include to control the sugar levels in the blood. Objectives: The basic objectives were to find out associations between diabetes & its complications like obesity, gallstone, got & arthritis and also with other parameters like BMI, physical activity, lifestyle, serum uric acid levels, & food allergy. Methodology: A cross–sectional study was conducted among 200 participants of north 24 paraganas (WB) India from March 2015 to May 2015. Data were collected by anthropometric measurement, clinical assessment, and diet and thus were analyzed. Result: In most of the cases association was found between diabetes and different complications. Conclusion: from the study it can be concluded that diabetes is a risk factor for the development of complications like gallstone, obesity, gout, hypertension, high cholesterol level, CVD and hypertension.***

Keywords: Diabetes, BMI, Hypertension, Obesity, Anthropometry

1. Introduction

Diabetes mellitus (DM) is a group of metabolic disorders characterized by a chronic hyperglycemic condition resulting from defects in insulin secretion, insulin action or both. Permanent neonatal diabetes is caused by glucokinase deficiency, and is an inborn error of the glucose-insulin signaling pathway [1]. The estimated worldwide prevalence of diabetes among adults in 2010 was 285 million (6.4%) and this value is predicted to rise to around 439 million (7.7%) by 2030 [2]. India, a country experiencing rapid socioeconomic progress and urbanization, carries a considerable share of the global diabetes burden [3].According to a national study conducted in India the prevalence of diabetes is high in urban India. There is a large pool of subjects with impaired glucose tolerance at a high risk of conversion to diabetes [4]. Diabetes mellitus is reaching potentially epidemic proportions in India. The level of morbidity and mortality due to diabetes and its potential complications are enormous, and pose significant healthcare burdens on both families and society. Given the disease is now highly visible across all sections of society within India, there is now the demand for urgent research and intervention - at regional and national levels - to try to mitigate the potentially catastrophic increase in diabetes that is predicted for the upcoming years [5].

The prevalence of diabetes is increasing rapidly worldwide and the World Health Organization (2003) has predicted that by 2030 the number of adults with diabetes would have almost doubled worldwide, from 177 million in 2000 to 370 million[6]. Experts project that the incidence of diabetes is set to soar by 64% by 2025, meaning that a staggering 53.1 million citizens will be affected by the disease [7].

People with diabetes may experience many serious, long-term complications. Some of these complications begin within months of the onset of diabetes, although most tend to develop after a few years. Most of the complications gradually worsen. In people with diabetes, strictly controlling the levels of glucose in the blood makes these complications less likely to develop or worsen. Most complications are the result of problems with blood vessels. Glucose levels that remain high over a long time cause both the small and large blood vessels to narrow. The narrowing reduces blood flow to many parts of the body, leading to problems **[8].**

Epidemiologic studies provide evidence for co-existence of hypertension and diabetes, insulin resistance , increased tissue inflammation and reactive oxygen species production resulting in endothelial dysfunction, increased tissue renin-angiotensin- aldosterone system of diabetes and hypertension.[9] Insulin resistance and hyperglycaemia both contribute to the development of endothelial cell dysfunction and increased oxidative stress, culminating in accelerated atherosclerosis.[10] In the UK Prospective Diabetes study, every 1 % increase in A1C was associate with a 12 percent increase in heart failure [11] In the strong Heart Study, the presence of type 2 diabetes was associated with left ventricular enlargement and decreased myocardial function in both men and woman.[12] In Jordan, a study reported that thyroid dysfunction was present in 12.5 percent of type 2 diabetic patients. [13] During hyperthyroidism the half life of insulin is reduced most likely secondary to an increased rate of degradation and an enhanced release of biologically inactive insulin precursor.[20] A reduced rate of liver glucose production is observed in hypothyroidism and accounts for the decrease in insulin requirement in hypothyroid diabetic patients.[14]

2. Materials & Method

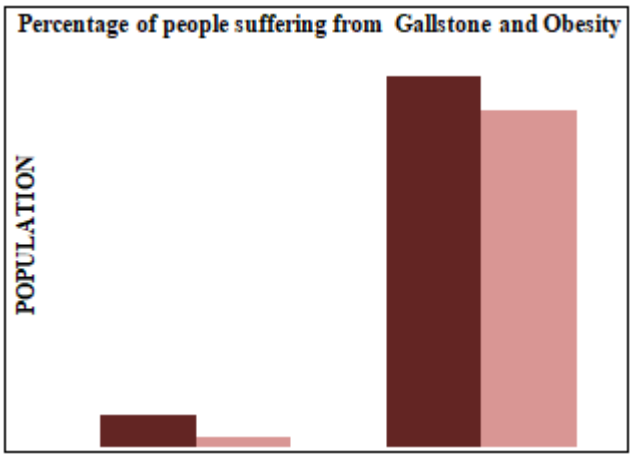
This is a cross sectional study, conducted in North 24 Parganas (W.B) India. A total of 200 respondents participated in the study. A total number of 100 respondents in the age group of 20-60 years were included with early diagnosis of diabetes and 100 non diabetics were selected maintaining the inclusion criteria. The survey was conducted using written questionnaire.(ref)

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Analysis: Results of this study were analyzed using percentage and represented graphically.

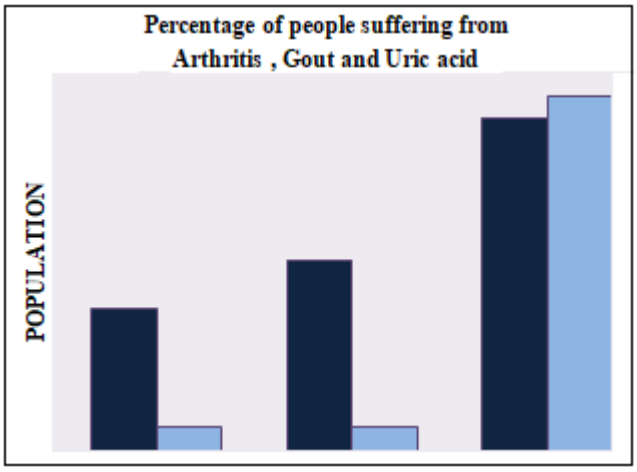
3. Result and Discussion

1) Percentage of people suffering from Gallstone and Obesity



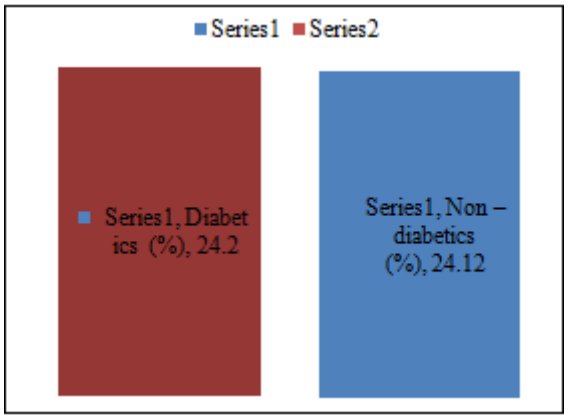
According to this result it was found that obesity is much more common in diabetics than in the non diabetics. People who are suffering from diabetes and are obese are 34% whereas people who are non diabetic but are suffering from obesity and are only 31 %. It was also found that diabetics are more prone to gallstone than non diabetics. About 3 % people are suffering from gallstone who are having diabetes whereas only only1% people are suffering from gallstone who don't have diabetes.

2) Percentage of people suffering from Arthritis , Gout and Uric acid



According to present results it can be stated that only 14 % of diabetic people have arthritis whereas 15 % of non diabetic people have arthritis. So, it's not clear whether diabetes directly causes arthritis, it is clear that the combination of these chronic conditions poses special challenges for people who live with both of them. Further research is needed to establish whether type 2 can cause arthritis and, if it does, to figure out the underlying relationship between the diseases. It was also found that diabetic patients are more prone to gout than the non diabetics. 8% of people having diabetes suffer from gout whereas only 1% of non diabetic people suffer from gout whereas 6% diabetic patients are having uric acid and only 1 % of non diabetic people have uric acid.

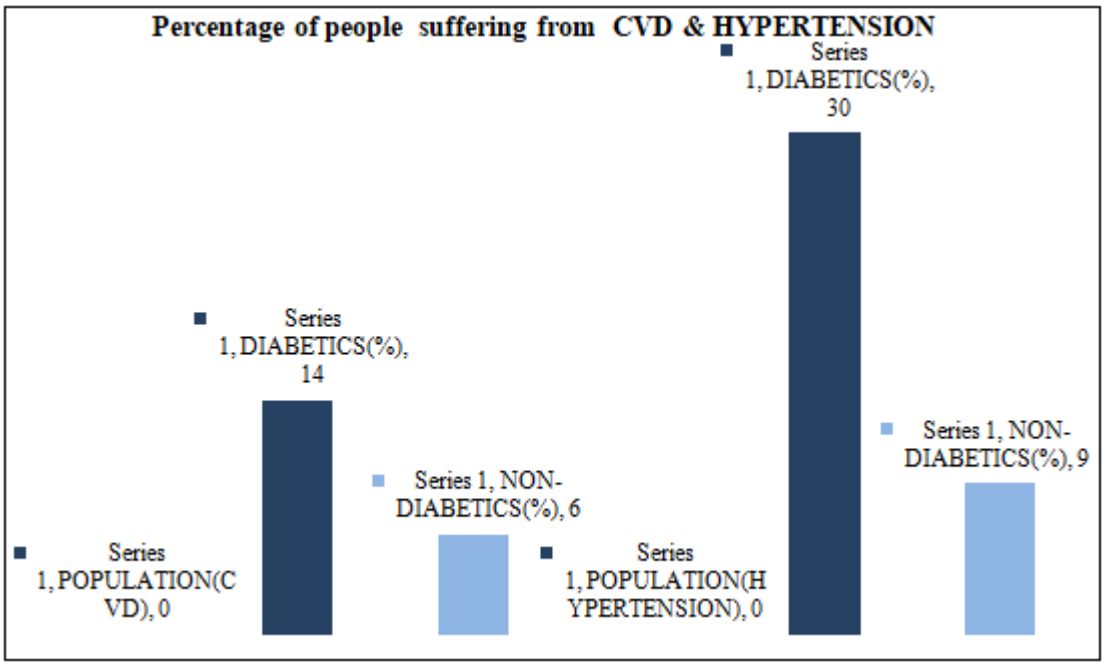
3) Distribution according to BMI :



According to this result it can be stated that diabetic people have a higher BMI i.e 24.20 than the non diabetics i.e. 24.12.

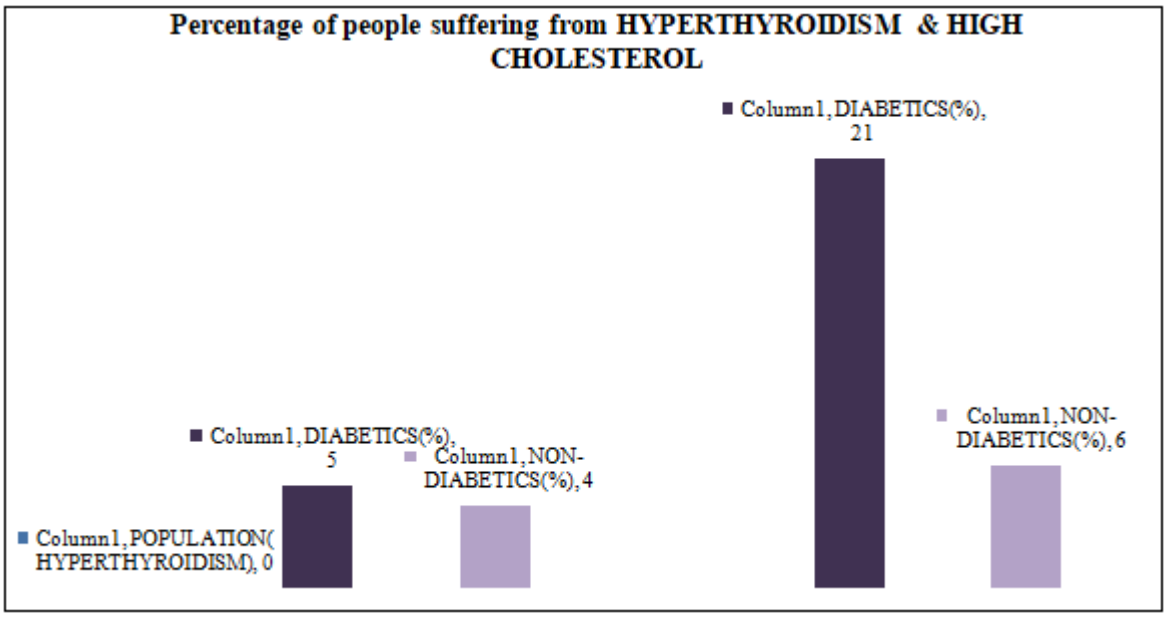
4) Percentage of people suffering from Hypertension and CVD

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According to this result it was found that hypertension is much more common in diabetic than in non diabetic. People who are suffering from diabetes and are hypertensive are 30 percent whereas people who are non diabetic but are suffering are hypertension are only 9 percent. According to this result diabetic patients are more prone to cardiovascular disease. 14% of total diabetic patients are suffering from different type of cardiovascular disease whereas people who are non diabetic but are suffering from cardiovascular disease are only 9 percent.

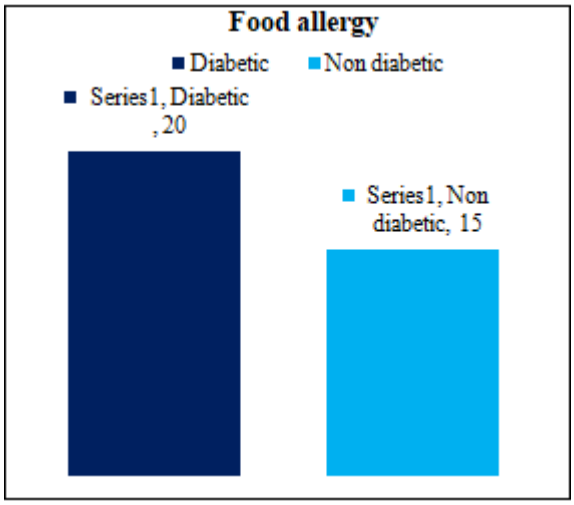
5) Percentage of people suffering from high cholesterol level



According to this result diabetic patients are more prone to thyroid disorder then non diabetic patient. 5% of total diabetic patients are suffering from hyperthyroidism whereas people who are non diabetic but are suffering from hyperthyroidism are only 4 percent. It was found that diabetic patients are more prone to cholesterol than non diabetic. About 21% people are suffering from high level of cholesterol who are having diabetes whereas only 6% people are suffering from hypercholestolemia who don't have diabetes.

6) Distribution according to food allergy:

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According to this result it was found that diabetic patient are more prone to allergy then non diabetic patient. 20% of total diabetic patients are suffering from allergy whereas people who are non diabetic but are suffering from allergy are only 15%.

4. Conclusion

Diabetes is a condition in which body's ability to convert glucose (sugar) to energy is impaired. Here in this study diabetes and its association with few complications were assessed.

From the study it can be concluded that diabetes is a precipitating factor for development of complication like gallstone, obesity, gout, hypertension, high cholesterol level, CVD and hypertension.

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