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Epidemiological study on diabetes in urban areas of Hazaribagh Jharkhand

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Abstract
Background: Epidemiological studies identifies the aetiological factors that lead to the pathogenesis of the disease. These informations are helpful in the planning and implementation of programs that are made to prevent, control and treat diseases. Epidemiological study on diabetes helps in identifying the people who are diabetic in the community, early identification help is lowering the rate of complications. Diabetes Mellitus, commonly called as diabetes is a chronic (long term) diseases caused due to insufficient production of the hormone insulin or when the body cannot effectively use the produced insulin.
Material and Methods: 375 subjects in the age group of 20 years and above were randomly selected for three urban areas of Hazaribagh. Three urban areas were randomly selected. Demographic data, anthropometric data, biochemical estimation was done of the study subjects. Data was put into excel sheet and results were calculated.
Results: In the present study out of total 375 respondents, 157 (41.86) of the respondents were male and rest 218(58.13%) were females**.** Out of total 375 study subjects 296 (78.9%) were from upper lower class, 77 (20.5%) from lower middle class and 2(0.5%) from lower class. Diabetes was found in 54(14.4%) of the study population. Pre diabetes was found in 42(11.2%) of the study population.
Conclusion: The prevalence of diabetes is increasing in all socio economic groups in India. Lifestyle changes and lack of physical activity are the most common reasons of the rapid rise in prevalence. Dietary patterns also play an important role. Strategies should be made to communicate the masses about the ill effects of being hyperglycemic and steps to reduce the same.

Keywords: Diabetes, urban areas, prevalence, epidemiology

Introduction
Diabetes Mellitus, commonly called as diabetes is a chronic (long term) diseases caused due to insufficient production of the hormone insulin or when the body cannot effectively use the produced insulin. It is often called metabolic disease. Metabolic diseases refers to those disorders in which the various reactions in the body cells are affected, like production and utilisation of energy due to abnormal production of one or more hormones, or deficiency of an enzyme in the body. Insulin hormone is produced by the beta cells of islets of langerhans of the pancreas. It acts like a vehicle to pass the glucose from the food we eat from the blood stream into the body cells. Insulin also helps in the metabolism of proteins and fats. This in turn leads to the production of energy in the body. International Diabetes Federation (2021) reported that 10.50% people worldwide are diabetic and this number is expected to increase to 11.30% by 2030 and 12.20% by 2045. In India the prevalence is increasing too. India ranks second to china with the maximum number of people with diabetes. National Family Health Survey (2021) showed that the prevalence of diabetes in Jharkhand was 5.8% urban and 5.2% rural adult female population >15 years had random blood sugar level 141-160mg/dl.

Diabetes is broadly classified into two types
Type 1 diabetes
Type 1diabetes is also called juvenile diabetes, as it affects people of young age of 4-5 years. It represents about 10% of all people with diabetes. According to WHO in 2017 there were 9 million people with type 1diabetes, and most of them were from high income countries. Patients suffering with type 1 diabetes show sudden weight loss, frequent urination (polyuria), tiredness, lack of energy, feeling thirsty (polydipsia), blurred vision, bedwetting etc.

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Type 2 diabetes

Type 2 diabetes also called non insulin dependent diabetes mostly occurs at a later age affecting adults. But nowadays children, adolescents and young people are also being affected by it due to unhealthy eating habits and lack of physical activity. Type 2 is more common in overweight and obese individuals of middle to late age but is increasingly being seen in younger age groups and in those with lower body mass index (BMI) as well. Obesity is one of the main cause of insulin resistance. Other risk factors include overweight, family history of diabetes, unhealthy diet like use of refined grains and saturated fats, physical inactivity etc.

Material and Methods

This is a cross sectional study was conducted between May 2018 to December 2019 among individuals 20 years and above to estimate the prevalence of diabetes in rural area. The geographical area selected for the study was rural area of Hazaribagh district. Hazaribagh is situated 93km from its state capital Ranchi. The rural population of the district is 84.12%. Out of total urban areas 3 villages were randomly selected. Matwari, janra nad Babugaon were randomly selected. 125 samples were taken from each village. Individuals were selected by simple random sampling. Written informed consent was taken prior to the study. Physically/mentally ill individuals, diseased and non-cooperative people were excluded from the study. Interview questionnaire contained data on personal details, demographic and family income etc. Biochemical test was done by glucose estimation. Fasting blood samples were taken and estimation was done using standard procedures. Data were put in Microsoft excel worksheet and estimation was done. Analysis was done and results were expressed in the forms of tables, graphs and figures.

Results and Discussion

The present study was conducted between November 2018 to January 2020. A total of 375 subjects were investigated for this study. 125 individuals were from each of the 3 villages of Hazaribagh district. Matwari, Babugaon and Jabra were included in the study areas.

Out of total 375 respondents, 157 (41.86) of the respondents were male and rest 218(58.13%) were females. The percentage of male respondents was higher than the females.
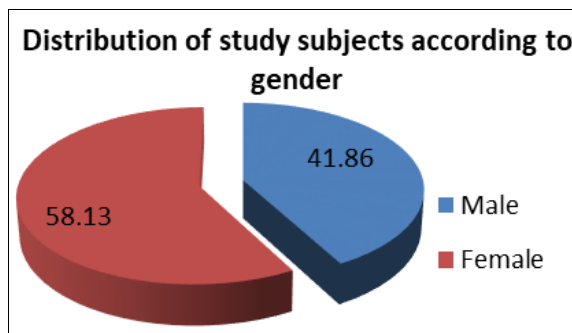

Fig 1: Gender distribution of the study subjects

Table 1: Educational status of the study population

Educational status	Jabra N	Babugaon N	Matwari N	Total N	%
No formal schooling	11	12	15	38	10.13
Primary school	39	20	10	69	18.40
Middle school	27	26	32	85	22.66
High school	17	24	11	52	13.86
Intermediate or diploma	11	12	35	61	16.26
Graduate	20	31	22	73	19.46

Table 1 shows the Educational status of the study population. Out of total 375 study subjects 38 subjects (10.13%) had no formal schooling, 69 (18.40%) studied upto primary school, 85 (22.66%) had middle school qualification, 52(13.86%) had high school degree, 61 (16.26%) had intermediate or diploma and 73 (19.46%) were graduate. This shows that not many people from the study area are graduate and also quite a good number of people also are not having any formal education.
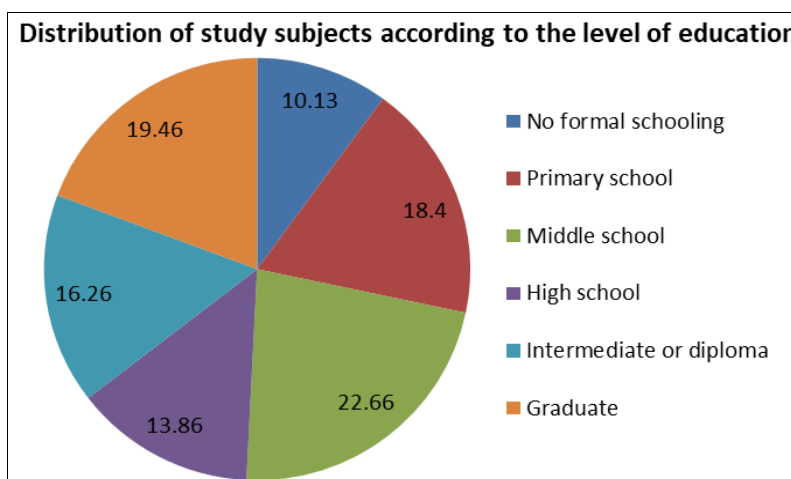

Fig 2: Graphical representation of educational status of the study population

Table 2: Prevalence of diabetes in urban population of Hazaribagh

Glucose range	Jabra	Babugaon	Matwari	Total	%
70-109 (Normal)	89	98	92	279	74.4
110-125 (Impaired fasting glucose)	14	12	16	42	11.2
>125 (Diabetes)	22	15	17	54	14.4

The study reveals that 22 people from Jabra, 15 from babugaon and 17 from matwari study area are diabetic with fasting blood sugar levels more than 125mg/dl. A total of 54 subjects of our total 375 are found to be diabetic. 14.4% of the

total urban population is found to be diabetic. Also 14, 12 and 16 people from Jabra, Babugaon and Matwari respectively are found to be pre diabetic with their fasting blood sugar levels between 110-125mg/dl. Total 42 subjects 11.2% of the studies population are found to be pre diabetic. 279(74.4%) of the subjects have normal blood sugar levels as standardised by WHO. Anjana R M *et al*. (2017) [8] conducted a nationwide study and found the prevalence of 13.5% in urban areas of Jharkhand. The present study data is comparable with this data.

Table 3: Distribution of respondents according to the blood glucose range

Glucose range	N	%
70-109 (Normal)	279	74.4
110-125(Impaired fasting glucose)	42	11.2
>125 (Diabetes)	54	14.4

The study shows that 54 (14.4%) are diabetic, 42 (11.2%) pre diabetic and 279(74.4%) normal blood sugar levels
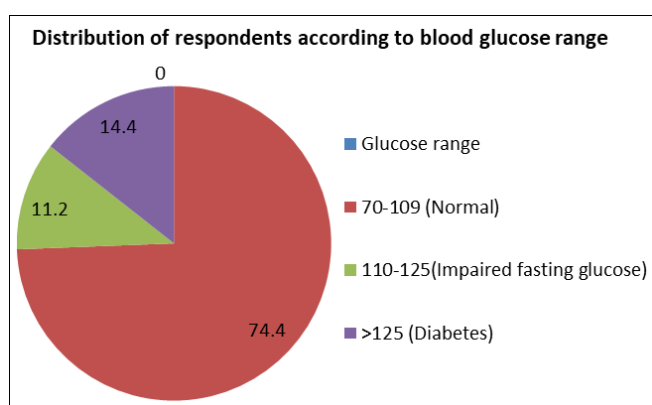

Fig 3: Graphical representation of respondents according to the blood glucose range

Table 4: Self reported/Newly diagonised and total diabetes

	Jabra	Babugaon	Matwari	Total	%
Self-reported	7	8	10	25	6.66
Newly Diagnosed	15	7	7	29	7.73
Total	22	15	17	54	14.4

The study shows that of total 375 studied subjects 25 (6.66%) were known diabetic and self-reported themselves to be diabetic at the time of study whereas 29(7.73%) were newly diagnosed diabetic. This shows that are a lot of people who are unaware of the condition that they are suffering from diabetes.
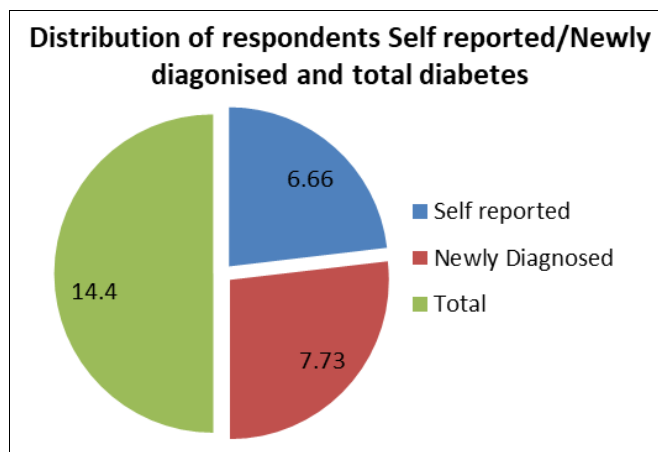

Fig 4: Shows the self-reported, and newly diagnosed diabetics

Conclusion
The prevalence of diabetes in urban areas is increasing rapidly. Unhealthy eating habits and sedentary lifestyle are the two most important factors. Awareness among the people and education are the two most important ways to decrease the prevalence rate of diabetes. Adopting healthy eating practice like high fibre foods, avoiding saturated fats and limiting total fat is required. 30 minutes of exercise minimum 5 days in a week is required to be physically active and prevent diseases. Preventing the disease is better than treatment.

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