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Prevalence of gall stone disease in type 2 diabetic patients in rural and urban Indian population: 100 cases cross sectional study

Medical Science

KEYWORDS : Diabetes mellitus, Gall stone disease, Prevalence

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ABSTRACT

Diabetes mellitus refers to a group of common metabolic disorders that share the phenotype of hyperglycemia. Diabetes is an "iceberg" disease. Currently the number of cases of diabetes worldwide is estimated to be around 150 million. Gall stone disease is associated with approximate 50% patients of long standing type 2 diabetes mellitus. Prevalence of gall stone disease also varies in urban and rural population. There are a lot of risk factors for developing gall stone disease in which metabolic syndrome like diabetes is one of them. Our current study aims to check the overall prevalence of gall stone disease in Indian population and comparison of prevalence of GSD between rural and urban Indian population.

Introduction

Diabetes is an "iceberg" disease. Currently the number of cases of diabetes worldwide is estimated to be around 150 million. This number is predicted to double by 2025 (a prevalence rate of about 5.4 per cent). It is estimated that 20 per cent of the current global diabetic population resides in South-East Asia Region. The number of diabetic persons in the countries of the region is likely to triple by the year 2025 increasing from the present estimates of about 30 million to 80 million.[1] .The global increase in the prevalence of diabetes is due to population growth, aging, urbanisation and an increase of obesity and physical inactivity. Roughly 80% of people with diabetes are in developing countries, of which India and China share the larger contribution. It is estimated that the total number of people with diabetes in 2010 to be around 50.8 million in India, rising to 87.0 million by 2030.[2]

Diabetes mellitus is one of the risk factors in cholesterol gallstones. Individuals with diabetes mellitus are reported to have a 2-fold to 3-fold increase in the incidence of cholesterol gallstones[3].Cholesterol stones account for more than 90 % of gall stone in western industrialized countries. There are several important mechanisms in formation of lithogenic bile, the most important is increased biliary secretion of cholesterol. This may be associated with obesity, metabolic disorder like diabetes, high caloric and cholesterol rich diets or drugs (clofibrate)[4].

Other important mechanism in cholesterol gall stone formation is gall bladder hypo motility leading to delayed gall bladder emptying and stasis[5].diabetic neuropathy develops in approximately 50% individuals with long standing type 1 and 2 DM . it may manifest as polyneuropathy, mononeuropathy and autonomic neuropathy among which polyneuropathy is most common[6]. Contractibility of the gallbladder is reduced as a consequence of diabetic neuropathy in diabetics. Such phenomenon reduces the frequency of enterohepatic cycling of the bile salt pool and results therefore in an expansion of both the bile salt pool and biliary cholesterol secretion. Such responses allow cholesterol to accumulate within the gallbladder, in excess of the other solubilizing biliary lipids. In addition, gallbladder distention and stagnation associated with diabetic neuropathy allows such supersaturated bile to precipitate its cholesterol content and the resultant stones to grow.[7]

Aim of our present study is to check the prevalence of gall stone disease in Indian population. Our study also compares the prevalence of GSD between rural and urban population.

Method and material:

The study was conducted on 100 clinically diagnosed diabetic patients attending medicine outdoor patient department (MOPD) or admitted in medicine ward of Shri Guru Ram Dass medical college, Amritsar. 20 normal age and sex matched individual constituted the control group to evaluate the incidence of GSD.

Eligibility criteria includes: 1.TYPE 2 –Diabetic patient of age group 40-70 were comprised the study group. 2. Written consent for the trial was obtained from all the patients after examining them in detail and consent of institutional ethical committee was obtained.

Exclusion criteria: The following exclusion criteria were adherent to the study.

All non-diabetic patients

The patient of age group less than 40 years or more than 70 years

Patients who refused to give informed written consent.

Patient was eliminated from the study if at any stage it was found that patient had developed life threatening symptoms or it was observed that continuation of study was not in the interest of the patient. After recording the consent of the subjects in the study group as well as the control group detailed history was recorded regarding the symptoms of diabetes and symptoms suggestive of autonomic neuropathy like postural hypertension. Clinical examination including general physical examination and systemic examination of central nervous system, respiratory system, cardiovascular system and gastrointestinal system, autonomic nervous system was done.

Ultrasound examination of abdomen was performed after 12 hours of overnight fasting in the morning using real time scanner with 3.5 megahertz transducer. Both cases and control group were assessed. Presence of gall stone and sludge were considered positive for gall stone disease.[8]

Results:

The table1 shows that in the study group GSD was present in 45 (45%) of patients and was absent in 55 (55%). In control group GSD was present in 3 (15%) and absent in 17 (85%) which was statistically significant. So prevalence of GSD in study group was 45% and in control group was 15%.

The table2 shows that GSD was present in 7 (15.6%) patients living in rural area, 38 (84.4%) patients living in urban area. GSD was absent in 32 (58.2%) patients living in rural area and 23 (41.8%) living in urban area which was statistically highly significant. So prevalence of GSD in rural population was 15% and in urban population was 84%.

Table 1. Showing distribution of GSD between study and control group

GSD	Study Group		Control Group	
	No.	%age	No.	%age
Absent	55	55	17	85
Present	45	45	3	15

Statistical analysis of table 1

GSD	Chi- square value	p value	Significance
	6.250	.012	Significant

Table 2. DISTRIBUTION OF PATIENTS ACCORDING TO URBANIZATION IN STUDY GROUP BETWEEN GSD POSITIVE AND GSD NEGATIVE

Urbanization	GSD +		GSD -	
	No.	%age	No.	%age
Rural	7	15.6	32	58.2
Urban	38	84.4	23	41.8

Statistical analysis

	Chi- square value	p value	Significance
GSD	18.903	.000	Highly Significant

Limitations of study:

1. In our study cross sectional data of 120 patients is small but the prevalence of GSD found to be same as other comparing studies.
2. We have taken a cross sectional data here from mix urban and rural population served by government medical college Patiala, Punjab. Patients were matched for age and sex for study and control groups. But in study group patients were enrolled randomly from urban and rural population but still our medical college opd serves both rural and urban population to same extent as our statistical data.

Discussion :

In the study group the prevalence of GSD was present in 45% patients with diabetes mellitus and in control the prevalence of GSD was present in 15% patients, it was statistically significant. It was in accordance the study done by Al-Bayati and Kodayer[9] (2012) in which the incidence of gallstones was 33% in diabetic patient and 17% in non-diabetic patients, it was also statistically significant. Study done by Elmehdawi et al [10] (2009), Gupta et al[11] (2008) also showed significant increase in incidence of GSD in diabetic patients.

In the present study 84.4% diabetic patients with GSD were living in urban area and 15.6% were living in rural area. This was statistically highly significant. These results were similar to the study Liu et al[12] (2012) in which 68.2% patients with GSD were living in urban areas, showing that there was a significant to corelation between gall stone disease and urbanization.

Conclusion

We therefore conclude that prevalence of GSD in Indian diabetes population is high making diabetes mellitus is a risk factor for gall stone disease. Elderly age, female sex and long duration of DM are independent risk factor for GSD. Living in an urban area is more strongly associated with prevalence of gall stone disease as compared to rural area which has been proved in our study, so we recommend urbanization another risk factor for gall stone disease.

References

1. Park K.(2011) Epidemiology of chronic non-communicable diseases and conditions. Park's textbook of preventive and social medicine (21st edn.). Jabalpur: M/s Banarsidas Bhanot: 362-66.
2. Ramachandran A, Das AK, Joshi SR, Yajnik SR, Shah S, Kumar PKM.(2010 jun) Current Status of Diabetes in India and Need for Novel Therapeutic Agents. JAPI .58 Suppl:7-9.
3. 3.Hahm JS1, Park JY, Park KG, Ahn YH, Lee MH, Park KN.(1996 Nov) .Gallbladder motility in diabetes mellitus using real time ultrasonography. Am J Gastroenterol,91(11):2391-4.
4. Norton j.(2015) "Harrison's principles of internal medicine" vol 2,19th edition,p.2076-2077.
5. Norton j. (2015) "Harrison's principles of internal medicine" vol 2,19th edition,p.2078
6. Norton j.(2015) "Harrison's principles of internal medicine"vol 2,19th edition,p.2426.
7. Thiel DHV(1984) Diabetes mellitus and hepatobiliary disease. Acta Medica Portuguesa 1984;5:59-65.
8. Norton j .(2015) "Harrison's principles of internal medicine" vol 2,19th edition,p.2027
9. 9 Al-Kayatt MK and Al-Youzbaki DB(2008) "Sociological risk factors in the development of gallstones for women in the childbearing Age a Case-control study". Irazi J Comm Med,21(2):97-103.
10. Elmehdawi RR, Elmajberi SJ, Beheih A, Elramli A(2009) "Prevalence of gall bladder stones among type 2 Diabetic patients in Benghazi Libya : A Case-control study. Libyan" J Med.;4(1): 27–30.
11. RS Gupta, HK Rao, AR Singh, AP Singh .(2008). "Gall Bladder Disease in Type 2 Diabetes Mellitus". Avaiable at : http://www.japi.org/ april2008/Oral_Diabetes%20Mellitus_Endocrinology_Clinical%20Pharmacology.htm.
12. Liu CM, Hsu CT, Li CY, Chen CC, Liu ML, Liu JH.(2012) "A population-based cohort study of symptomatic gallstone disease in diabetic patients". World J Gastroenterology;18(14):1652-9.