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Role of Indian diabetic risk score in assessing non alcoholic fatty liver disease and coronary artery disease in obese diabetics

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Abstract
India is deemed as the world's capital of diabetes, with majority of people being undiagnosed. Therefore, a diabetes risk score will help us to device effective screening strategies to unmask hidden burden of the disease. Indian Diabetic Scoring System (IDRS) is one of the scoring system which uses 4 simple parameters namely age, abdominal obesity, family history of diabetes and physical activity. Non Alcoholic Fatty Liver Disease (NAFLD) is the most common chronic liver disease in the world with increase in its prevalence in patients with type 2 diabetes mellitus. The aim of this study is to compare the efficacy of IDRS with USG in diagnosing NAFLD as well as to find correlation between IDRS and ECG as well as 2D echo changes in patients with ischaemic heart disease. The study included 120 patients with type 2 diabetes mellitus. Prevalence of NAFLD is more in type 2 diabetes mellitus. High risk IDRS (IDRS ≥ 60) has positive predictive value for fatty liver changes in patients with diabetes and also in patients with ischaemic heart disease with ECG changes.

Keywords: type 2 diabetes mellitus, Indian diabetes risk score (IDRS), non alcoholic fatty liver disease (NAFLD), coronary artery disease, ischemic heart disease

Introduction

Diabetes mellitus can alter hepatic metabolism and physiology. Recently liver disease has been recognized as a major complication of type II diabetes mellitus. There is high prevalence of non alcoholic fatty liver disease [NAFLD] in individuals with Type 2 Diabetes Mellitus [T2DM]. The prevalence of NAFLD is rising in India. It begins as mild steatosis, develops into non-alcoholic steatohepatitis (NASH) which can progress to cirrhosis and even Hepatocellular Carcinoma making early detection and prevention of diabetic liver disease important [1, 2]. T2DM is recognized as equivalent to Coronary Artery disease [CAD] and thus carries the risk as that of established CAD. About 60% of diabetic subjects succumb to CAD which makes it the leading cause of morbidity and mortality in diabetic patients [3]. It is thus prudent to look for the evidence of subclinical CAD in every patient of diabetes mellitus.

Madras Diabetic research foundation (MDRF) have developed an Indian Diabetes Risk Score (IDRS) which is a clinical scoring system [4]. using four simple parameters namely age, abdominal obesity, family history of diabetes and physical activity.

IDRS was classified as low (<30), medium (30-50) and high (≥60) and was initially used to diagnose undetected diabetics, metabolic syndrome and CAD [5].

However there are very few studies regarding if IDRS to be used as a screening tool for detecting NAFLD as well as CAD in diabetics. Hence, the current study is undertaken to test whether IDRS can be used to screen diabetic population to identify high risk patients for these complications at early stage in a cost effective way.

This study is thus an attempt to correlate the efficacy of clinical evaluation of patients and blending that observation into outcomes which otherwise would have costed huge sum of money as well as time.

Indian diabetes risk scoring: [IDRS]

Table 1

Particulars	Score
1. AGE	
<35 years	0
35- 49 years	20
≥50 years	30
2. Waist Circumference (WC)	
WC <80 cm [female], <90 cm [male]	0
WC 80- 89 cm [female], 90- 99 cm [male]	10
WC ≥90 cm [female], ≥100 cm [male]	20
3. Physical Activity	
Strenous activity	0
Moderate activity	10
Mild activity	20
No activity	30
4. Family History of Diabetes	
No Diabetes in Parents	0
One parent is Diabetic	10
Both parents having Diabetes	20
Total Score	100

Materials and Methods

This is an observational cross sectional study. The data was collected from the patients fulfilling the inclusion and exclusion criteria attending either out-patient or in-patient department of SSG hospital, Vadodara. The duration of data collection was 8 months. Informed written consent was

obtained from patient or responsible attendant before inclusion in the study. The ethics committee of the institution gave the permission for the study. 120 patients with type 2 diabetes mellitus were included.

Inclusion Criteria: All non alcoholic type 2 diabetes mellitus patients between the age of 26-80 years were included in the study.

Exclusion criteria: Patients with HBsAg or HCV positivity, on drugs causing fatty damage to the liver like amiodarone, sodium valproate, glucocorticoids, methotrexate, having hypo or hyper thyroidism, nephropathy, any malabsorption syndromes and other conditions like celiac sprue, wilson's disease.

For data collection, detailed history was taken in each case. Clinical examination, calculation of IDRS, laboratory investigations such as complete blood count, liver function tests, renal function tests, urine analysis, HBsAg and Anti-HCV, fasting and postprandial blood sugar, HbA1C, lipid profile, ultrasonography (USG) to look for presence or absence of fatty liver, ECG and 2D echo. Statistical analysis was carried out for 120 non-alcoholic patients with type 2 diabetes mellitus.

USG features include any 4 out of the following 5 sonographic features [6].

- Attenuation of the image quickly within 4-5 cm of depth.
- Echogenic diffusely but particularly important to note brightness within the first 2-3 cm of depth.
- Liver uniformly heterogenous.
- Thick subcutaneous depth (>2 cm) and
- Liver fills entire field with no visible changes.

Comparision was done between patients having fatty liver changes on USG with those coming positive on IDRS scoring, further comparing the sensitivity and specificity of IDRS with USG considering USG as standard for diagnosing fatty liver. ECG and 2D echo changes as per the risk stratification of IDRS were also compared for getting the risk of coronary artery disease.

Conclusion

- The prevalence of non-alcoholic fatty liver disease in our study was 61.66%.
- Gender wise distribution of fatty changes was almost nearly equal in males and females (51.6% in females and 48.6% in males).
- Maximal distribution of fatty changes in liver is seen in the age group of 50-60 years with highest IDRS distribution in that age group.
- IDRS showed statistically significant results in identifying diabetic patients who had fatty liver on USG, with p value <0.05 suggesting that patients with high risk IDRS i.e. ≥60 have strong predictive value for fatty liver. IDRS henceforth can be used as a screening tool for fatty liver changes in patients with diabetes.
- IDRS ≥60 is statistically significant for ECG changes in patients with ischemic heart disease with p value <0.05. This was the first study in which IDRS could be used for categorizing and identifying high risk patients who have ischemic changes in ECG.
- For 2D echo changes, no statistical significance could be found, p value being >0.05. Hence, IDRS could not be used for detecting or categorizing ECHO changes in such patients.

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