

Original Research Article

To determine the levels of high sensitivity C-reactive protein (hs-CRP) and alanine aminotransferase (ALT) in patients of Non-alcoholic fatty liver disease with Diabetes Mellitus and in healthy controls

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Abstract:

Background & Method: The aim of this study is to determine the levels of high sensitivity C-reactive protein (hs-CRP) and alanine aminotransferase (ALT) in patients of Non-alcoholic fatty liver disease with Diabetes Mellitus and in healthy controls. Particle enhanced immunoturbidimetric test with two applications. The high sensitive application is recommended for samples with concentrations lower than 20 mg/L and where high precision and extremely good sensitivity is required (measuring range of hs application: 0.05 mg/L-20 mg/L). The universal application is characterized by extraordinary wide measuring range (0.3-350 mg/L) and low sample volume.

Result: Significant increase in hs-CRP in cases at 0 month when cases compared to controls, significant increase in hs-CRP in cases at 6 month when cases compared to controls, significant increase in ALT in cases at 0 month when cases compared to controls, show significant increase in ALT in cases at 6 month when cases compared to controls.

Conclusion: Non-alcoholic fatty liver disease is emerging as major health burden in West and in India as well. The risk of developing NAFLD in T2DM is significantly more. hsCRP is significantly high in T2DM and in those with sonographically detected NAFLD. High serum level of hsCRP is an independent risk factor of short term progression to hepatic complications like progressive changes in grades of fatty liver and NASH in patients with NIDDM and NAFLD. For the perspective of long-term prognosis, the serum level of CRP is also a potential predictive factor of cirrhosis, hepatic failure and malignant tumors.

Keywords: hs-CRP, ALT, Diabetes Mellitus & fatty liver.

Study Designed: Observational Study.

1. INTRODUCTION

The natural history of NAFLD has been well described in the literature. De Alwis and Day summarised that 12-40% patients with simple steatosis progress to NASH with early fibrosis after 8-13 years; 5-10% patients with NASH and early fibrosis will progress to more advanced liver disease; and up to 50% of those with advanced fibrosis will develop cirrhosis[1]. Approximately 7% of patients with cirrhosis will develop hepatocellular carcinoma within 10 years, and 50% will need a liver transplant or die from a liver-related cause.

Information from the NASH Clinical Exploration Organization recommended that patients with NASH are bound to be female, have diabetes and insulin opposition, and higher liver transaminases[2]. A Swedish investigation of patients with biopsy demonstrated NAFLD over a mean of 13.7 years observed that the gamble of fibrosis movement is related with insulin opposition, weight gain, higher transaminases, lower platelet count and more articulated hepatic greasy infiltration[3].

High sensitivity C-reactive protein (hs-CRP), synthesized in hepatocytes, is an acute-phase reactant that increases nonspecifically in bacterial infection, immuno-inflammatory diseases and malignant disorders[4&5]. Obesity, particularly abdominal adiposity, is characterized by low-grade systemic inflammation. In prospective studies, high hs-CRP levels have been shown to predict the metabolic syndrome, type 2 diabetes mellitus (T2DM) and coronary heart disease (CHD). Increased hs-CRP levels have been shown to correlate with generalized and abdominal adiposity in Asian Indians[6].

2. MATERIAL & METHOD

The present study was conducted in the Department of Biochemistry of the SVBP Hospital, Lala Lajpat Rai Memorial Medical College, Meerut, U.P. from April 2020 to Mar 2021.

The present study included 160 cases of Non-alcoholic fatty liver disease with stable Type II Diabetes Mellitus aged between 30 to 60 years including IPD and OPD patients of Medicine SVBP Hospital, Meerut, U.P. and 160 apparently healthy controls matched for age and sex. Informed written consent was taken from all the subjects.

Determination of the concentration of CRP by photometric measurement of antigen-antibody reaction of antibodies to human CRP bound to polystyrene particles with CRP present in the sample.

Particle enhanced immunoturbidimetric test with two applications. The high sensitive application is recommended for samples with concentrations lower than 20 mg/L and where high precision and extremely good sensitivity is required (measuring range of hs application: 0.05 mg/L-20 mg/L). The universal application is characterized by extraordinary wide measuring range (0.3-350 mg/L) and low sample volume.

3. RESULTS

TABLE 1: DISTRIBUTION OF CASES ACCORDING TO AGE GROUP

S. No.	Age group	No. cases	Percentage
1	30-40	28	17.5%
2	41-50	54	33.75%
3	51-60	78	48.75%
Total		160	100%

As per this table total 160 patients were included. In our study most of the patients were of the age group 51-60 years i.e. 48.75% of total patients and Minimum no of patients were of the age group 30-40 years with 17.5 % of total patients.

TABLE 2: COMPARISON OF FASTING BLOOD SUGAR BETWEEN CASE AND CONTROL

Group	Mean±S.D	P value
Case	152.6±22.5	<0.005
Control	91.21±4.80	

Table shows mean Fasting blood sugar of cases was 152.6±22.5 and of control were 91.21±4.80.

TABLE 3: COMPARISON OF HIGH SENSITIVITY C - REACTIVE PROTEIN BETWEEN CASE AND CONTROL INITIALLY AT 0 & 6 MONTH

Group	Mean±S.D 0 Month	Mean±S.D 6 Month	P value
Case	5.94±4.16	6.40±4.37	<0.005
Control	1.89±1.29	1.97±0.93	

Table shows significant increase in hs-CRP in cases at 0 month when cases compared to controls, significant increase in hs-CRP in cases at 6 month when cases compared to controls.

TABLE 4: COMPARISON OF ALANINE AMINOTRANSFERASE BETWEEN CASE AND CONTROL INITIALLY AT 0 MONTH

Group	Mean±S.D 0 Month	Mean±S.D 6 Month	P value
Case	48.9±32.4	48.6±33.8	<0.005
Control	23.68±5.20	24.72±4.51	

Table shows significant increase in ALT in cases at 0 month when cases compared to controls, show significant increase in ALT in cases at 6 month when cases compared to controls.

4. DISCUSSION

The relationship between's diabetes mellitus and NAFLD is vigorous as shown by a concentrate in Japanese grown-ups where it was seen that as 27% with ordinary fasting glucose, 43% with weakened fasting glucose and 62% with recently analyzed diabetes had

NAFLD[7]. Subsequently, NAFLD ascends in relation to blood glucose level. Our review shows that T2DM fundamentally expands the seriousness of NAFLD contrasted with non-diabetics affirming that diabetes is a significant gamble factor for NAFLD in our populace. Bruce et al., (2003)[8] have uncovered that a poor quality irritation goes before and predicts the beginning of diabetes in grown-ups. Anyway there are, truth be told, not many examinations including the clinical connection with NAFLD with biochemical as well as sonological proof.

Yeniova AO et.al.[9]stated that hs-CRP can be utilized as a painless marker of NAFLD as being major areas of strength for an of NAFLD in this study was found. In our review, mean hsCRP levels were viewed as higher in patients of NAFLD with T2DM. In our review, out of 160 patients of NAFLD with T2DM, 43 patients had higher hs-CRP level i.e, 53.75% patients had raised hs-CRP level and staying 37 patients i.e, 46.25% were having typical hs-CRP level.

Out of 160 patients, 12 patients, for example 15% has shown weakening with change of greasy liver to its higher grade. Out of 160 patients, 11 patients. for example 13.75% has shown improvement with change of greasy liver to its lower grade and to ordinary ultrasonography discoveries. Out of 160 patients, 57 patients. for example 71.25% has shown no progressions in ultrasonography discoveries. No understanding has shown proof of NASH, Cirrhosis and hepatocellular carcinoma in this transient review.

5. CONCLUSION

Non-alcoholic fatty liver disease is emerging as major health burden in West and in India as well. The risk of developing NAFLD in T2DM is significantly more. hsCRP is significantly high in T2DM and in those with sonographically detected NAFLD. High serum level of hsCRP is an independent risk factor of short term progression to hepatic complications like progressive changes in grades of fatty liver and NASH in patients with NIDDM and NAFLD. For the perspective of long-term prognosis, the serum level of CRP is also a potential predictive factor of cirrhosis, hepatic failure and malignant tumors.

6. REFERENCES

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