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CO RELATION OF SERUM TRIGLYCERIDES AND HIGH DENSITY LIPOPROTEINS WITH SEVERITY OF ACUTE PANCREATITIS-A PROSPECTIVE STUDY IN COASTAL AREAS OF KARAIKAL

General Surgery

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ABSTRACT

Acute pancreatitis is an acute inflammatory condition of pancreas that can range from mild self-limiting disease to severe pancreatitis charecterised by acute inflammation,necrosis,Systemic Inflammatory Response Syndrome(SIRS),Multi Organ Dysfunction Syndrome(MODS) and death. The atherogenic index of plasma(AIP) reflects the TG and HDL levels calculated as log(TG/HDL).AIP is a biomarker for dyslipidemia ,metabolic syndrome , coronary syndrome.Low HDL level and elevated TG level is a well known risk factor for persistent organ failure in acute pancreatitis.In this study we aim to correlate serum triglycerides and HDL levels with severity of acute pancreatitis, All patients with first episode of acute pancreatitis with serum amylase and/or lipase ≥3 times the upper normal limit and Characteristic imaging on a radiological study were included in the study. Clinical data and blood samples were obtained patients' diagnoses of AP. . The AIP was defined as log (TG/HDL). The severity of AP was evaluated according to the 2012 revised Atlanta classification and recorded as mild, moderately severe, or severe AP.statistical analysis was done and results were derived as Atherogenic Index of plasma(AIP) was significantly higher in the SAP group. Hence AIP can be used as predictor for severity of acute pancreatitis

KEYWORDS

Acute pancreatitis, HDL, triglycerides, hypertriglyceridemia, atherogenic index, amylase, lipase.

INTRODUCTION

Acute pancreatitis is an acute inflammatory condition of pancreas that can range from mild self-limiting disease to severe pancreatitis charecterised by acute inflammation,necrosis,Systemic Inflammatory Response Syndrome(SIRS), Multi Organ Dysfunction Syndrome (MODS) and death. Predicting the severity of pancreatitis becomes crucial in making appropriate clinical management.Many attempts were made previously to find out prognostic and predictive markers that stratify the risk,the most widely used being the Ranson's criteria or modified Glasgow criteria. Both use clinical and biochemical parameters scored over the first 48 hours of admission.There are many other approaches to predicting severity. At 24 hours after admission an APACHE II score of 8 or more or a serum C-reactive protein level of >150mg/dl has a similar accuracy in predicting severity as Ranson's criteria

The more recently proposed Bedside Index for Severity of Acute Pancreatitis (BISAP) is calculated from blood urea nitrogen (> 25 mg/dl), impaired mental status (GCS <15), presence of systemic inflammatory response syndrome (SIRS), age >60 years, and pleural effusion.The atherogenic index of plasma(AIP) reflects the TG and HDL levels calculated as log(TG/HDL).AIP is a biomarker for dyslipidemia ,metabolic syndrome , coronary syndrome.Low HDL level and elevated TG level is a well known risk factor for persistent organ failure in acute pancreatitis.

Since there is a close relationship between impaired lipid metabolism and severity of pancreatitis,AIP can be considered a predictor for the same.

Aims And Objectives:

To correlate serum triglycerides and HDL levels with severity of acute pancreatitis

MATERIALS AND METHODS:

Study design: Prospective observational study.

Study location: Vinayaka Mission's Medical College and Hospital, Karaikal.

Study duration: 12 months, April 2021 to April 2022.

Sample size: 45

- Written informed consent was obtained from all the patients .

Inclusion Criteria

(1) All patients with first episode of acute pancreatitis with serum amylase and/or lipase ≥3 times the upper normal limit
(2) Characteristic imaging on a radiological study.

Exclusion Criteria

(1) Age < 18 years old
(2) Idiopathic pancreatitis
(3) Patients with incomplete lipid profile data
(4) Chronic pancreatitis,
(5) Recurrent pancreatitis.

Study Procedure:

Clinical data and blood samples were obtained patients' diagnoses of AP. The presence of hypertension, diabetes mellitus, alcohol consumption, and smoking was recorded. The patients' body mass index (BMI) was calculated using their height and weight. Complete blood count, blood urea nitrogen, creatinine, lactate dehydrogenase, CRP, procalcitonin, amylase, and lipase were recorded at the time of admission. Abdominal computed tomography (CT) scans were performed to diagnose AP and differentiate AP from other diseases. Once AP was diagnosed, the TG and HDL levels were measured as soon as possible. Additionally, scoring systems such as the Ranson score, BISAP, and CTSI were calculated. The AIP was defined as log (TG/HDL). The severity of AP was evaluated according to the 2012 revised Atlanta classification and recorded as mild, moderately severe, or severe AP [4].

Mild AP is defined by the absence of organ failure and local or systemic complications. Moderately severe AP is described as transient organ failure that resolves within 48 h. SAP is described as persistent organ failure. Non-SAP included mild AP and moderately severe AP

Statistical Analysis

Categorical variables were presented as frequencies and percentages. Continuous variables were presented as means (± standard deviation) or medians with ranges. The Pearson rank method was used to evaluate the correlation between the AIP and the Atlanta classification. After adjustments for confounding factors, the odds ratios for SAP were evaluated using univariate and multivariate logistic regression analyses in order to determine the predictive factors of SAP among all

the patients with AP and the predictive factors for intensive care unit (ICU) admission. The accuracy of the prediction power for SAP was determined by the area under the curve (AUC) using receiver operating characteristic (ROC) curves. AUC values were used to compare the predictive abilities of SAP using the AIP and scoring systems. A p value < 0.05 was considered statistically significant. Analyses were performed using SPSS version 23

RESULT

Baseline Charecteristics Of Patients:

The study included 45 patients with acute pancreatitis based on the diagnostic criteria . Table 1 describes the participants characteristics. The mean age was 50.2±18.7 and 30 patients were male and 15 female respectively. The causes of acute pancreatitis was gallstone ,alcohol consumption, hypertriglyceridemia in 21 patients,18 patients & 6 patients respectively.

According to the revised Atlanta classification ,acute pancreatitis was mild ,moderate, severe in 24 patients ,15 patients & 6 patients respectively in this study.

Ranson's score, BISAP was higher in severe acute pancreatitis(SAP) group . The number of ICU admissions ,mortality, and length of hospital stay was higher in the SAP group.

Similarly the Atherogenic Index of plasma(AIP) was significantly higher in the SAP group.

The area under the curve(AUC) of various scoring systems and AIP was calculated for predicting SAP.

The AUC of AIP for prediction of SAP was 0.812. The AIP was positively correlated with CRP,BMI,WBC and Atlanta classification.

VARIABLE	TOTAL PATIENTS	SAP	NON -SAP	p Value
Gender (M:F)	45(30:15)	6(4:2)	39(26:13)	0.213
Age (years)	50.2±18.7	55.8±19.5	53.4±18.1	0.453
Aetiologies • Gallstone • Alcohol • Hypertriglyceridemia • Smoking	21.15(47.05%) 18(40%) 5.8(12.95) 20.11(44.7%)	19.98(44.4%) 14.98(33.3%) 9.99(22.2%) 9.47(21.05%)	21.87(48.6%) 18.85(41.89%) 5.46(12.15) 35.1(78%)	0.172 0.521
BMI	24.8±3.8	26.8±3.1	23.8±3.7	0.212
Atlanta Classification • Mild • Moderate • Severe	24(55.2%) 15(34.11%) 6(10.58%)			
Ransons	2.8±1.8	4.8±1.7	2.2±1.3	<0.001
BISAP	1.2±1.3	3.2±1.8	1.9±1.1	<0.001
Mortality	4(4.7%)	3(3.5%)	1(1.2%)	<0.001
Lab findings • CRP(mg/dl) • HDL(mg/dl) • TG LEVELS(mg/dl)	4.1±5.1 30.4±19.5 280±543	6.2±5.1 33±19.5 350±520	3.7±6.1 39.4±17.5 260±442	0.321 0.182 0.084
ATHEROGENIC INDEX OF PLASMA (AIP)	0.7±0.6	0.8±0.6	0.5±0.6	<0.001

- Area under the curve for predicting SAP

Variable	AUC	Standard Error	p- value
AIP	0.812	0.053	<0.001
TG	0.543	0.049	0.004
HDL	0.412	0.056	0.031
RANSONS SCORE	0.723	0.035	<0.001
BISAP	0.889	0.042	<0.001

DISCUSSION

In this study we have correlated serum levels of triglycerides and HDL with severity of acute pancreatitis by means of AIP.It was found that AIP was higher in patients with severe AP compared to patients with mild and moderate level of severity.It was also seen that AIP is positively correlated with the Revised Atlanta classification.It was analysed that AIP was an independent predictor for severe acute pancreatitis when compared to HDL and TG levels independently.Very few studies have been carried out to explore the relationship between AIP and Acute Pancreatitis.

Hence the study suggests that AIP may be a simple biomarker for predicting the severity of acute pancreatitis

Study Limitations

1) Small sample size
2) Study restricted to a single institution
3) The cause and effect relationship could not be determined
4) other inflammatory markers such as Tumor necrosis factor and interleukin-6 were not measured .

CONCLUSION

In this study ,atherogenic index of the plasma is significantly associated with the severity of acute pancreatitis.Impaired lipid metabolism has positive correlation with the severity of acute pancreatitis.Since the parameters are easily available and can be tested at all centre ,it can be easily employed in our clinical practice for all diagnosed case of acute pancreatitis.

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