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RESEARCH ARTICLE

EVALUATION OF PROGNOSTIC SIGNIFICANCE OF CRP, IONIC CALCIUM, AND SERUM ALBUMIN IN ACUTE PANCREATITIS

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Abstract

Introduction: Acute pancreatitis is defined as “an inflammatory process of pancreas with possible peripancreatic tissue involvement and multi organ dysfunction syndrome with increasing mortality rate”. In response to initial insult, acinar cells release proinflammatory cytokines, such as TNF α , IL-1, 2 and 6, and anti-inflammatory mediators such as IL-10 and IL-1 receptor antagonist. Acute pancreatitis is best diagnosed clinically in a patient presenting with 2 of the 3 following criteria. (1) Symptoms consistent with pancreatitis, (2) Serum lipase or amylase levels more than 3 times the laboratory’s upper range of normal, and (3) Radiologic features suggestive of pancreatitis, usually using CECT. Usually, the first two criteria are present, and CECT is not required for diagnosis.

Aims & Objective: 1. To determine the prognosis of acute pancreatitis on the basis of quantitative value of CRP, SERUM ALBUMIN AND IONIC CALCIUM in admitted patients of HIMS on day of admission and after 48 hours. 2. To assess the severity of acute pancreatitis as mild, moderate, severe form (as per REVISED ATLANTA CLASSIFICATION 2013) and compare it with values of CRP, SERUM ALBUMIN AND IONIC CALCIUM.

Methodology: The study will be conducted over a period of 18 months (January 2021 to July 2022) in which all patients coming to General Surgery department at Hind Institute of Medical Sciences, Barabanki, UP with diagnosis of acute pancreatitis will be included.

Result: We found that male population was higher than the female population, which was statistically significant. Higher number of patients had Pain in Abdomen Since 3 Days and patients were Alcoholic but this was statistically significant. Association of CRP Value with Day is statistically **significant**. Association of serum albumin value with Day is statistically **significant**. Association of Ionic Calcium value with Day is statistically **significant**. This study shows that there is relation between se.CRP, se.Albumin and ionic calcium to assess the severity of Acute Pancreatitis.

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Introduction:-

Acute pancreatitis is defined as “an inflammatory process of pancreas with possible peripancreatic tissue involvement and multi organ dysfunction syndrome with increasing mortality rate”. The exact mechanism of pathophysiology of acute pancreatitis is not clearly known, but has been attributed to abnormal activation of pancreatic enzymes within the acinar cells. Co-localization of zymogen granules and lysosomes occur resulting in activation of the enzymes, which results in autodigestion of pancreas. In response to initial insult, acinar cells release proinflammatory cytokines, such as TNF a, IL-1, 2 and 6, and anti-inflammatory mediators such as IL-10 and IL-1 receptor antagonist¹

Acute pancreatitis is best diagnosed clinically in a patient presenting with 2 of the 3 following criteria.(1) Symptoms consistent with pancreatitis,(2) Serum lipase or amylase levels more than 3 times the laboratory’s upper range of normal, and (3) Radiologic features suggestive of pancreatitis, usually using CECT. Usually, the first two criteria are present, and CECT is not required for diagnosis. Acute pancreatitis can be classified as mild, moderate and severe form. Mild acute pancreatitis is characterised by interstitial edema of the gland and is usually a self-limiting disease. Whereas in the severe form, there is pancreatic necrosis, sever systemic inflammatory response and multi – organ failure which can lead to death. Hence it is prudent to identify risk stratification tools for the disease, which help in the management.A revision in 2013 of the Atlanta classification of acute pancreatitis recommends that patients with acute pancreatitis can be stratified into 3 groups²

CRP is a pentameric protein synthesized by the liver, whose level rises in response to inflammation. CRP is an acute-phase reactant protein that is primarily induced by the IL-6 action on the gene responsible for the transcription of CRP during the acute phase of an inflammatory/infectious process. There is some question about whether dysregulation of the role of CRP in the clearance of apoptotic cells and cellular debris plays a role in the pathogenesis of systemic lupus erythematosus (SLE), but this has not been definitively demonstrated. It has been demonstrated to have some protective properties in animal studies on lung tissue in alveolitis by reducing neutrophil-mediated damage to the alveoli and protein leakage into the lung.CRP has both proinflammatory and anti-inflammatory properties. It plays a role in the recognition and clearance of foreign pathogens and damaged cells by binding to phosphocholine, phospholipids, histone, chromatin, and fibronectin. It can activate the classic complement pathway and also activate phagocytic cells via Fc receptors to expedite the removal of cellular debris and damaged or apoptotic cells and foreign pathogens. This can become pathologic, however, when it is activated by autoantibodies displaying the phosphocholine arm in auto-immune processes, such as idiopathic thrombocytopenic purpura (ITP). It can also worsen tissue damage in certain cases by activation of the complement system and thus inflammatory cytokines.²

As compared to the erythrocyte sedimentation rate, which is an indirect test for inflammation, the levels of CRP rise and fall rapidly with the onset and removal of the inflammatory stimulus, respectively. Persistently elevated CRP levels can be seen in chronic inflammatory conditions such as chronic infections or inflammatory arthritides such as rheumatoid arthritis.

There are numerous causes of an elevated C-reactive protein. These include acute and chronic conditions, and these can be infectious or non-infectious in etiology. However, markedly elevated levels of CRP are most often associated with an infectious cause² (an example of pathogen-associated molecular pattern recognition). Trauma can also cause elevations in CRP (alarmin response). More modest elevations tend to be associated with a broader spectrum of etiologies, ranging from sleep disturbances to periodontal disease.

Acute pancreatitis (AP) is a severe inflammation of the pancreas presented with sudden onset and severe abdominal pain with a high morbidity and mortality rate, if accompanied by severe local and systemic complications. It is the most common gastrointestinal cause of hospitalization, associated with high financial burdens. Several studies have shown that the incidence of AP is increasing, probably as a result of a combination of risk factors, such as obesity and gallstone disease³. The overall mortality rate is 3% to 10%, but patients with the severe form of the disease are at an increased risk of death, with a mortality rate of 36% to 50%. Although its etiology is complex and not known for certain, the two most common causes are gallstones and alcohol. Numerous studies have been published about the pathogenesis of AP; however, the precise mechanism behind this pathology remains unclear. Even with the proposal of several mechanisms about the pathophysiological process of AP, none are totally enlightening. Some of the hypotheses include acinar and ductal premature activation of trypsin, leukocyte attraction and activation, recruitment of cytokines, adhesion molecules, and oxygen free radicals, which lead to mitochondrial dysfunction and microcirculatory injury. Initial AP events take place in the acinar cells. Acinar cells can act as inflammatory cells as they respond, synthesize, and release cytokines, chemokines, and adhesion molecules⁴.

Aims & Objective:-

1. To determine the prognosis of acute pancreatitis on the basis of quantitative value of CRP, SERUM ALBUMIN AND IONIC CALCIUM in admitted patients of HIMS on day of admission and after 48 hours.
2. To assess the severity of acute pancreatitis as mild, moderate, severe form (as per REVISED ATLANTA CLASSIFICATION 2013) and compare it with values of CRP, SERUM ALBUMIN AND IONIC CALCIUM.

Material And Methods:-

The study was conducted over a period of 18 months (January 2021 to July 2022) in which all patients coming to General Surgery department at Hind Institute of Medical Sciences, Barabanki, UP with diagnosis of acute pancreatitis was included.

Serum amylase, lipase level in diagnostic range of pancreatitis was included.

Normal amylase:

30-110 U/L

Normal lipase:

24-150 U/L

In ACUTE PANCREATITIS, amylase and lipase was more than 3 times the higher value of the normal value.

Inclusion Criteria

All patients admitted with the diagnosis of acute pancreatitis on the basis of clinical, biochemical, radiological (any 2 out of 3) (patients with raised amylase and lipase more than 3 times of higher limit of normal value)

Exclusion Criteria

- Chronic pancreatitis
- Pancreatic malignancy
- Patient not willing to give consent.

Sample Size:

All cases during the study period are selected for sample size calculation, open epi (free software sample size) supported by centre for disease control and prevention, Atlanta.

30 cases from January 2021 till 18 months

$P=2\%$ per 1000 population

$1-p=98\%$

$N=Z_{\alpha/2}P(1-P)/E^2$

Z_{α} =Critical value of z score at α level of significance

$Z_{\alpha}=1.96$ at $\alpha=5\%$ level of significance

$E=5\%$

$N=(1.96)^2 \times 2 \times 98 / 5^2$

$N=30.11$

Sample size: 30

Data analysis and compilation-

Data analysis was done using student trial SPSS version 26.0/epi info. www.openepi.com

Ethical approval was taken from the concerned institutional ethical committee for the commencement of the study.

Informed consent was taken from the patients in English as well as in Hindi.

Detailed history, examination was done which will include demographic data consisting of age, sex, occupation, bowel habits, personal history including dietary history and alcohol or tobacco consumption.

Presenting complaint, general examination, per abdominal examination C.B.C, RANDOM BLOOD SUGAR, BLOOD UREA, SERUM CREATININE, SERUM AMYLASE, SERUM LIPASE, TOTAL BILIRUBIN (DIRECT, INDIRECT), LFT, SERUM ELECTROLYTES, CHEST XRAY, USG ABDOMEN. CECT ABDOMEN TO BE DONE IF REQUIRED.

Quantitative value of CRP, serum Albumin and ionic calcium test was done on the day of admission, 48 hours and on day 7.

Normal value of CRP: 6-10mg/dl

Ionic Calcium: 4.64-5.28mg/dl

Serum albumin: 3.4-5.4gm/dl

The values of CRP, SERUM ALBUMIN, and IONIC CALCIUM were matched with clinical severity of acute pancreatitis during the subsequent hospital course as determined by the presence or absence of organ failure (Revised Atlanta Classification, 2013).

Patients with acute pancreatitis were given treatment according to presentation, severity and were included in study for recording incidence. All these patients were kept under 1 month follow up for treatment outcome.

Results:-

Table 1:- Distribution of Age in Group.

Age In Group	Frequency	Percent
≤ 40	11	36.7%
41 – 50	6	20.0%
51 – 60	5	16.7%
≥ 61	8	26.7%
Total	30	100.0%

Table 2:- Distribution of Sex.

Sex	Frequency	Percent
Female	11	36.7%
Male	19	63.3%
Total	30	100.0%

In our study, 11 (36.7%) patients were Female and 19 (63.3%) patients were male.

Table 3:- Distribution of Chief Complain.

Chief Complain	Frequency	Percent
Generalized Weakness For 2 Days	1	3.3%
Loss Of Appetite For 2 Days	3	10.0%
Pain In Abdomen For 3 Days	16	53.33%
Pain In Abdomen for 2 Days	4	13.3%
Vomiting For 2days	5	16.7%
Vomitting For 3days	1	3.3%
Total	30	100.0%

The value of p is .0001. The result is significant at $p < .05$.

Table 4:- Distribution of Alcohol Intake (Y/N).

Alcohol Intake (Y/N)	Frequency (>80g/d for 5-6years)	Percent
YES	17	56.67
NO	13	43.33
Total	30	100.0%

56.67% of patients were alcoholic.

Table 5:- Distribution of Hydration at admission.

Hydration	Frequency	Percent
Dehydrated	12	40.0%
Moderately/well hydrated	18	60.0%
Total	30	100.0%

In our study, 18 (60.0%) patients were hydrated at the time of admission.

Table 6:- Distribution of USG Abdomen.

USG Abdomen	Frequency	Percent
Acute Pancreatitis,	13	43.3%
Acute Pancreatitis, With AscitiesWith Hepatomegaly	11	36.7%
Acute Pancreatitis, With Hepatomegaly	6	20.0%

In our study, 13 (43.3%) patients had Acute Pancreatitis and 11 (36.7%) patients had Acute Pancreatitis, With AscitiesWith Hepatomegaly.

The value of z is 1.9427. The value of p is .05238. The result is not significant at $p < .05$.

Table 7:- Distribution of mean Age.

	Number	Mean	SD	Minimum	Maximum	Median
Age	30	43.2667	18.1106	21.0000	65.0000	43.0000

In above table showed that the mean Age (mean \pm s.d.) of patients was 43.2667 \pm 18.1106.

Table 8:- Distribution of mean BMI.

	Number	Mean	SD	Minimum	Maximum	Median
BMI	30	23.9733	1.5483	21.2000	26.5000	23.5000

In above table showed that the mean BMI (mean \pm s.d.) of patients was 23.9733 \pm 1.5483.

Table 9:- Distribution of mean Temp.

	Number	Mean	SD	Minimum	Maximum	Median
Temp	30	99.1600	1.5547	96.4000	102.0000	98.9000

In above table showed that the mean Temp (mean \pm s.d.) of patients was 99.1600 \pm 1.5547.

Table 10:- Distribution of mean SBP.

	Number	Mean	SD	Minimum	Maximum	Median
SBP	30	113.9333	8.7017	106.0000	132.0000	110.0000

Table 11:- Distribution of mean DBP.

	Number	Mean	SD	Minimum	Maximum	Median
DBP	30	73.0000	8.8318	66.0000	98.0000	68.0000

In above its shown that the mean DBP (mean \pm s.d.) of patients was 73.0000 \pm 8.8318.

In above it is showed that the mean SBP (mean \pm s.d.) of patients was 113.9333 \pm 8.7017

Table 12:- Distribution of mean PR.

	Number	Mean	SD	Minimum	Maximum	Median
PR	30	101.4667	3.5982	98.0000	106.0000	102.0000

In above table showed that the mean PR (mean \pm s.d.) of patients was 101.4667 \pm 3.5982.

Table 13:- Distribution of mean CRP.

	Number	Mean	SD	Minimum	Maximum	Median
CRP Day 0	30	67.4400	37.8445	50.8000	150.8000	50.8000
CRP 48HOURS	30	41.1133	19.3826	32.6000	88.0000	32.6000
DAY 7	30	17.340	7.2134	9	37	9.89

In above table showed that the mean CRP DAY 0 (mean \pm s.d.) of patients was 67.4400 \pm 37.8445.

In above table showed that the mean CRP On 48hours (mean \pm s.d.) of patients was 41.1133 \pm 19.3826.
The mean CRP DAY 7 (mean \pm s.d.) of patients was 17.340 \pm 7.21345.

Table 14:- Distribution of KFT.

	Number	Mean	SD	Minimum	Maximum	Median
Urea	30	36.9333	17.9788	30.0000	82.0000	30.0000
Creatinine	30	.9580	.1763	0.8900	1.4000	0.8900

In above table showed that the mean Se.Urea(mean \pm s.d.) of patients was 36.9333 \pm 17.9788.

In above table showed that the mean Se.Creatinine (mean \pm s.d.) of patients was .9580 \pm .1763.

Table 15:- Distribution of mean Electrolytes.

	Number	Mean	SD	Minimum	Maximum	Median
NA+	30	-133.8667	2.6618	-135.0000	-125.0000	-135.0000
k+	30	-4.2100	.6406	-4.9100	-3.5100	-3.9100
Ionic Ca ²⁺ day 0	30	-.8417	.2019	-1.1500	-0.6100	-0.8200
Ionic Ca ²⁺ 48hours	30	.8527	.2057	0.6200	1.0800	0.7200

Ionic ca2+ Day 7	30	0.99	.2767	1.23	1.43	0.87

Table 16:- Distribution of mean LFT.

	Number	Mean	SD	Minimum	Maximum	Median
SGOT	30	69.1000	32.7555	30.0000	102.0000	90.0000
SGPT	30	53.3667	35.1592	17.0000	97.0000	53.0000
ALP	30	108.1000	33.7622	73.0000	151.0000	108.0000
Protein	30	5.6140	.4730	4.2000	6.2000	5.8000
Albumin	30	1.7050	.5386	1.2000	2.7000	1.7000
T Bilirubin	30	1.0133	.1860	0.4600	1.2500	1.0900
Direct	30	.6563	.1438	0.3300	1.0100	0.6600
Indirect	30	.3570	.0823	0.1300	0.4300	0.3300

In above table showed that the mean SGOT (mean±s.d.) of patients was 69.1000± 32.7555, mean SGPT (mean±s.d.) of patients was 53.3667± 35.1592, mean ALP (mean±s.d.) of patients was 108.1000± 33.7622. Mean Se.Protein (mean±s.d.) of patients was 5.6140± .4730, mean Se.Albumin (mean±s.d.) of patients was 1.7050± .5386, mean T.Bilirubin (mean±s.d.) of patients was 1.0133± .1860. In above table showed that the mean Direct (mean±s.d.) of patients was .6563± .1438, mean Indirect (mean±s.d.) of patients was .3570± .0823.

Table 17:- Distribution of mean Se. Lipase.

	Number	Mean	SD	Minimum	Maximum	Median
Se.Lipase-(day 0)	30	600.6667	270.4777	83.0000	908.0000	573.0000
Se.Lipase-(day 2)	30	371.6000	226.6749	73.0000	668.0000	290.0000

In above table showed that the mean Se.Lipase-(day 0) (mean±s.d.) of patients was 600.6667± 270.4777. In above table showed that the mean Se.Lipase-(day 2) (mean±s.d.) of patients was 371.6000± 226.6749.

Table 18:- Distribution of mean Se. Amylase.

	Number	Mean	SD	Minimum	Maximum	Median
Se.Amylase-(day 0)	30	2338.5333	1180.4657	108.0000	3474.0000	2683.0000
Se.Amylase-108(day 2)	30	685.0000	267.5869	68.0000	913.0000	688.0000

In above table showed that the mean Se.Amylase-(day 0) (mean±s.d.) of patients was 2338.5333± 1180.4657.

In above table showed that the mean Se.Amylase-108(day 2) (mean±s.d.) of patients was 685.0000± 267.5869.

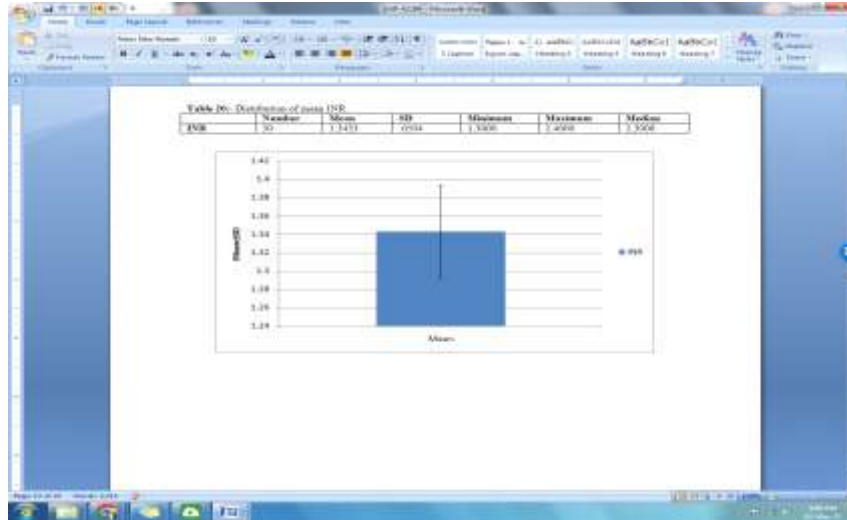
Table 19:- Distribution of mean ABG PH.

	Number	Mean	SD	Minimum	Maximum	Median
ABG PH	30	7.1933	.0829	7.1200	7.3400	7.2000

In above table showed that the mean ABG PH (mean±s.d.) of patients was 7.1933± .0829.

Table 20:- Distribution of mean INR.

	Number	Mean	SD	Minimum	Maximum	Median
INR	30	1.3433	.0504	1.3000	1.4000	1.3000



In above it has been shown that the mean INR (mean±s.d.) of patients was 1.3433± .

Day	CRP Value			Total
	6 – 10	<150	>150	
Day – 0	0	13	17	30
48hours	0	20	10	30
Day-7	0	23	7	30

Table 21:- Association between CRP Value:Day.

Chi-square Value:7.4685; **P value:** 0.023891.

Association of CRP Value with Day is statistically **significant** (p=0.0692).During admission **43.33%** patients were mild acute pancreatitis according to CRP,after 48hours **66.67%** were mild acute pancreatitis and after 7days **76.67%** were mild acute pancreatitis.On day 0 i.e day of admission moderate to severe i.e ranging above 150mg/L were 63.37%,33.33%,23.33% respectively.

Table 22:- Association between Ionic Calcium Value: Day

Day	Ionic Calcium value		Total
	1.2-1.5	<1.2	
Day – 0	12	18	30
48hours	20	10	30
Day- 7	25	5	30

Chi-square Value:17.2857; **P value:** 0.0005384

Association of Ionic Calcium value with Dayis statistically **significant** (p=0.0384). During admission,40% were hypocalcemic ,after 48hours 66.66% and on 7th day 80% were hypo calcemic. On day 0 i.e day of admission moderate to severe i.e ranging below 1.2 were 60%,33.33% and 20% respectively

Table 23:- Distribution of Serum Albumin Value.

Serum albumin	<3.4	3.4-5.4	Total
Day 0	19	11	30
On 48hours	13	17	30
Day 7	8	22	30

Association of serum albumin value with Day is statistically **significant** ($p=0.033217$). During admission, 63% were hypo albuminemia, after 48 hours 43.33% and on 7th day 30% were having hypo albuminemia.

Table 24:- Distribution of Organ Failure.

	N=30	% Of Patient
Present	5	16.66 %
Absent	25	83.33%

In our study, 25 (83.33.0%) patients had Organ Failure.

Table 25:- Distribution of Types of Organ Failure (N=5).

	N=5	% Of Patient
Transient (<48 hrs)	1	20%
Persistent (>48 hrs)	4	80%

In our study, 1 (20.0%) patient had Transient (<48 hrs) and 4 (80.0%) patients had Persistent organ failure (>48 hrs).

Table 26:- Distribution of System Involved(N=5).

	<48 hrs	>48 hrs
Respiratory Failure	2	-
Renal Failure	1	-
CVS	1	-
MODS		1

Table 28:- Distribution According to Atlanta Classification.

Atlanta Classification	N=30	% Of patient
Mild	25	83.33 %
Moderate	4	13.3 %
Severe	1	3.3 %

In our study, 25 (83.33%) patients had Mild, 4 (13.3%) patients had Moderate and 1 (3.3%) patient had Severe AP.

Table 29:- Comparison between ATLANTA Classification with CRP TITRE, IONIC Calcium and SE.Albumin.

	Mild	Moderate -Severe	P-VALUE
ATLANTA Classification	25	5	
CRP TITRE	Day-0 13 48-HRS-20 Day7-23	17 10 7	0.00567 Significant
IONIC Calcium	Day-0 12 48-HRS-20 Day7-25	18 10 5	0.00583 Significant
SE Albumin	Day-0 13 48-HRS-19 Day7-22	17 11 8	0.008602 Significant

According to, Serum Albumin and Ionic calcium Sensitivity: 100.0, Specificity: 100.0, Positive Predictive Value: 100.0, Negative Predictive Value: 100.0 and Accuracy: 100.0

Discussion:-

The present study was Analytical Study (observational type). This study conducted from 18 months From Jan 2021 to July 2022, Hind Institute of Medical Sciences, Salemabad Barabanki. 30 patients were included in this study.

In a study in2019⁵ it was found that pancreatitis is a disease of inflammation of the pancreas and is rising exponentially in the world. A North India based ayurvedic clinic has collected details of age, sex, religion, caste, profession, native place. The male-female ratio was 4.6:1. Highest incidences were noted in the age group of nineteen to forty-five years.

In a study in2018⁶ it was found that acute pancreatitis is an acute inflammatory process of the pancreas. There was no significant difference in the age of patients in each severity grade (p value: 0.242).

In our study, out of 30 patients, most of the patients were ≤ 40 years old [11 (36.7%)]. Age was statistically significant (p=.08012) (Z=1.7516). The mean Age of patients was [43.2667 \pm 18.1106].

We found that male population [19 (63.3%)] was higher than the female population [11 (36.7%)]. which was statistically significant (p=03846) (Z=2.0656).

In a study in1991⁷ it was found that an analysis of postmortem investigations between 1980 and 1985 revealed 43 patients with acute pancreatitis. Abdominal pain was present in only one patient. Amylase levels had been estimated in 11 patients, but the level was in the diagnostic range (≥ 3 times of upper normal level) in only four.

In this study mean Se.Amylase-(day 0) (mean \pm s.d.) of patients was 2338.5333 \pm 1180.4657.

and the mean Se.Amylase-108(day 2) (mean \pm s.d.) of patients was 685.0000 \pm 267.5869

In this study, Mean Se.Protein (mean \pm s.d.) of patients was 5.6140 \pm .4730, mean Se.Albumin(mean \pm s.d.) of patients was 1.7050 \pm .5386,

In a study in2020⁸ it was found that acute pancreatitis (AP) is a severe inflammation of the pancreas presented with sudden onset and severe abdominal pain with a high morbidity and mortality rate.

It was found that, higher number of patients had Pain in Abdomen Since 3 Days [14 (46.7%)] (p<0.0001) (Z=3.8759) and [15 (50.0%)] patients were Alcoholic but this was statistically significant

In a study in2013⁹ it was found that this guideline presents recommendations for the management of patients with acute pancreatitis (AP). Aggressive hydration should be provided to all patients, unless cardiovascular and/or renal comorbidities preclude it.

We found that, higher number of patients had Hydration [18 (60.0%)] but this was not statistically significant (p=12114) (Z=1.5492).

In our study, lower number of patients had Acute Pancreatitis, With Hepatomegaly [6(20.0%)] (p=05238) (Z=1.9427) but this was not statistically significant.

In a study in 2019¹⁰ it was found that to investigate the clinical characteristics of hypertriglyceridemia pancreatitis (HTGP) and evaluate the correlative risk factors for severe acute pancreatitis (SAP) in HTGP patients. Patients with HTGP had lower serum Ca²⁺ and higher hsCRP, NLR, and BMI, and these were associated with higher risk of developing SAP

In our study, the mean BMI of patients was [23.9733 \pm 1.5483], mean Temp of patients was [99.1600 \pm 1.5547], mean SBP of patients was [113.9333 \pm 8.7017], mean DBP of patients was [73.0000 \pm 8.8318] and mean PRof patients was [.101.4667 \pm 3.5982]

Mean RR of patients was 27.5333 ± 4.0576 , HB of patients was $11.4767 \pm .6704$ and TLC of patients was 15653.3333 ± 1694.1549 AND the mean PLT of patients was $2.8967 \pm .2442$.

In a study in 2021¹¹ it was found that maternal lipid profile in second trimester has rarely been investigated in the risk assessment for pre-eclampsia (PE). Receiver operating characteristic curves (ROC) defined the cut-off values of TG and HDL-c, and the final regression model included five statistically significant risk predictors for early-onset PE (maternal age of ≥ 35 years, multipara, pre-pregnancy body mass index (BMI) ≥ 25 kg/m², second trimester TG ≥ 2.59 mmol/L and second trimester HDL-c ≤ 2.03 mmol/L).

In a study in 2019⁵ it was found that pancreatitis is a disease of inflammation of the pancreas and is rising exponentially in the world. Highest incidences were noted in the age group of nineteen to forty-five years.

In a study in 2022¹² it was found that the incidence of hypertriglyceridemic acute pancreatitis (HTG-AP) has increased yearly, but updated population-based estimates on the incidence of HTG-AP are lacking. The highest incidence rate of acute pancreatitis was observed for men in the age group of 30-39 years.

In a study in 2015¹³ it was the significance of serum calcium and phosphorus levels in patients with acute myocardial infarction is not entirely clear. Twelve-month mortality was associated with CRP level (OR 2.21 [95% CI 1.00 to 4.89]; P=0.049) and also patient age (OR 1.08 [95% CI 1.00 to 1.17]; P=0.045).

Means CRP Day 0 Age in Group was higher in ≥ 61 [75.8000 ± 46.2910] compared to ≤ 40 [68.9091 ± 40.2906], 41 – 50 [67.4667 ± 40.8248] and 51 - 60 [$50.8000 \pm .0000$] but this was not statistically significant ($p < 0.7326$).

In a study in 2019⁵ it was found that pancreatitis is a disease of inflammation of the pancreas and is rising exponentially in the world. The male-female ratio was 4.6:1.

In a study in 2016¹⁴ it was diabetic ketoacidosis (DKA) is characterized by a biochemical triad of hyperglycemia, acidosis, and ketonemia. The MLR analysis indicated that males were 7.93 times more likely to have favorable outcome compared with female patients (odds ratio, 7.93; 95% confidence interval, 3.99 to 13.51), while decreases in mean APACHE II score (14.83) and serum phosphate (4.38) at presentation may lead to 2.86- and 2.71-fold better outcomes, respectively, compared with higher levels (APACHE II score, 25.00; serum phosphate, 6.04).

In a study in 2019¹⁰ it was found that to investigate the clinical characteristics of hypertriglyceridemia pancreatitis (HTGP) and evaluate the correlative risk factors for severe acute pancreatitis (SAP) in HTGP patients. Among the HTGP patients, the results indicated that Ca²⁺ (OR=0.018, P<0.001, 95%CI: 0.002–0.129) was an independent protective factor for SAP, while higher CRP (OR=1.008, P=0.004, 95%CI: 1.003–1.013), NLR (OR=1.314, P<0.001, 95%CI: 1.161–1.488), and BMI (OR=1.597, P=0.002, 95%CI: 1.195–2.314) were independent risk factors for SAP. Patients with HTGP had lower serum Ca²⁺ and higher hsCRP, NLR, and BMI, and these were associated with higher risk of developing SAP.

It was found that, Means CRP Day 0 BMI was higher in 26.5 BMI [90.6400 ± 54.5539] compared to 24.7 BMI [79.3714 ± 48.7950], 21.2 BMI [75.8000 ± 50.0000] and 23.5 BMI [$50.8000 \pm .0000$] but this was not statistically significant ($p = 0.1364$).

In a study in 2013⁹ it was found that this guideline presents recommendations for the management of patients with acute pancreatitis (AP). Aggressive hydration should be provided to all patients, unless cardiovascular and/or renal comorbidities preclude it. Early aggressive intravenous hydration is most beneficial within the first 12–24 h, and may have little benefit beyond. Association of serum albumin value with Day is statistically **significant** ($p = 0.033217$).

In this study during admission, 63% were hypo-albuminemia, after 48 hours 43.33% and on 7th day 30% were having hypo-albuminemia.

In our study, higher number of patients had Organ Failure [25 (83.33.0%)]

In this study, majority number of patients had Mild Pancreatitis [25 (83.33%)]

Conclusion:-

- Out of 30 patients, most of the patients were ≤ 40 years old. Age was statistically significant. The mean Age of patients was [43.2667 \pm 18.1106].
- We found that male population was higher than the female population. which was statistically significant.
- Higher number of patients had Pain in Abdomen Since 3 Days and patients were Alcoholic but this was statistically significant and more number of patients had Pallor and Normal X-ray Chest but this was statistically significant.
- Association of CRP Value with Day is statistically **significant**.
- Association of serum albumin value with Day is statistically **significant**.
- Association of Ionic Calcium value with Day is statistically **significant**.

7. According to this study, Serum Albumin and Ionic calcium Sensitivity: 100.0, Specificity: 100.0, Positive Predictive Value: 100.0, Negative Predictive Value: 100.0 and Accuracy: 100.0. at Day-0 1348-HRS, Day-0 1248-HRS and Day-0 1348-HRS

This study shows that there is relation between se.CRP, se.Albumin and ionic calcium to assess the severity of Acute Pancreatitis.

Limitation Of The Study:

In spite of every sincere effort my study has lacunae.

The notable short comings of this study are:

- The sample size was small. Only 30 cases are not sufficient for this kind of study.
- The study has been done in a single centre.
- The study was carried out in a tertiary care hospital, so hospital bias cannot be ruled out.

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