

Original Research Article

C T and Clinical Correlation of Severity of Acute Pancreatitis**Dr. Periasamy Subbiah¹, Dr. Prasanth²**¹Professor, ²General Surgeon (PG), Dept. Of Surgery, Chengalpet Medical College, Tamil Nadu, India***Corresponding author**

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Abstract: The cases of acute pancreatitis is more common now a days. Our ED admits cases of Acute Pancreatitis on almost on all days. Here we try to analyse the effectiveness of CT in diagnosis and grading of disease. So that we can effectively treat the disease and prevent further progression of the disease to more severe forms of systemic disease. In this article we correlate the CT findings with that of clinical observations and assess the severity of the disease.

Keywords: Marshall's scoring CT scoring, Acute Pancreatitis (AP)

INTRODUCTION:

Acute pancreatitis is often confused with that of acute alcoholic gastritis and diagnosed with the help of serum analysis. With advent of modern gadgets like U S G and Computerized Tomography we can identify the disease early and treat before the local disease becomes a systemic disease[1]. Early we grade the disease it is easier to treat the disease and control the damage. Severity index is assessed by correlating clinical grading with that of C T grading. There by creating a parallel correlation between C T findings and Severity of the disease.

We can evaluate the disease which are prone for MODS or SIRS[2]. There by we can intervene even before the actual on set of renal failure or respiratory distress. By assessing the possible systemic damage we can either introduce immune modulators or ventilator or dialysis. Or keep the patient under observation. Here in this article we correlate the findings of C T with clinical grading and out come the treatment our hospital.

Aims of Study

- To analyze and compare the various clinical presentations of acute pancreatitis.
- To correlate the severity of acute pancreatitis with regard to available biochemical parameters.
- To assess the severity in relation to computerized tomography of abdomen.
- To predict the outcome of acute pancreatitis with regard to CT abdomen.
- To prognosticate the disease.

- To decide the further management with CT abdomen and to decide when to intervene.

MATERIALS AND METHODS**Patients:**

50 patients from both sexes who presented with acute pancreatitis to the department of surgical emergency, Chengalpet medical college Hospital during the period July 2014 to September 2016 were included in the study.

Diagnostic Criteria for Acute Pancreatitis:

Acute pancreatitis was diagnosed if there were findings consistent with acute pancreatitis and a raised serum amylase above the upper reference limit(URL). This diagnosis was further complemented with transabdominal USG and CE-CT. Exclusion of acute pancreatitis in patients with acute abdominal pain was based on clinical, radiographic, endoscopic and surgical findings.

Severity Assessment of Acute Pancreatitis:

Assessment of severity based on clinical presentations. Assessment of severity was also based on CT abdomen. A correlation was obtained between clinical severity and that based on CT abdomen.

Scoring Systems:

Clinical Scoring:In AP patients appropriate laboratory and physiological data were recorded On day 1 and 48 hours after admission to calculate the ranson criteria. MODS score provides a means to grade the intensity of dysfunction of six organ systems: the respiratory (spo2),

renal(serum creatinine), hepatic(serum bilirubin), the hematological system(platelet count), nervous system(GCS), cardiovascular(pulse rate) and

Table-1: MODS SCORING [3]

ORGAN SYSTEMS	0	1	2	3	4
RESPIRATORY Spo2 in %	100	90-100	80-90	70-80	<70
RENAL Serum creatinine in mic.mol/l	<=100	101-200	201-350	351-500	>500
HEPATIC Serum bilirubin in mmol/l	<=20	21-60	61-120	121-240	>240
CARDIOVASCULAR Heart rate in BPM	70-80	81-90	91-100	101-110	110-120
HEMATOLOGICAL Platelet count *10 ⁹	>120	81-120	51-80	21-50	<=20
NEUROLOGICAL GCS	15	13-14	10-12	7-9	<6

Criteria for Organ Failure:

Organ failure was defined as acute respiratory failure necessitating intubation and mechanical ventilation and/or ARF, defined as need for hemodialysis. The criteria for initiating mechanical ventilation were tachypnoea (RR>35/min) and/or the need of inspiratory oxygen fraction Fio2 > 0.6 in order

to maintain pao2 > 60 mmHg. The hemodialysis was started in patients with significant reduction of renal function indicated by increased concentration of serum creatinine (>300mic.mol/l) and serum urea (>40mmol/l) and progressive metabolic acidosis in serial measurements.(PH < 7.28) with or without anuria or oliguria(<500ml/24hr).

Table-2: CT Scoring [4]

GRADE	APPEARANCE	SCORE
Grade A	Normal appearance	0
Grade B	Focal or diffuse enlargement of pancreas.	One
Grade C	Peripancreatic inflammation	Two
Grade D	Intra/ extrapancreatic fluid collection.	Three
Grade E	Two or more fluid collection or gas in pancreas or retroperitoneum	Four

CT Severity Index:

Necrosis score based on CE-CT.	
0% OF NECROSED PANCREAS	0
<33% OF NECROSED PANCREAS	2
33 – 50% OF NECROSED PANCREAS	4
>50% OF NECROSED PANCREAS	6

CT severity index = unenhanced CT score + necrosis score>5 score indicates an 8 fold higher mortality.

ANALYSIS AND OBSERVATIONS:

1. Relationship between Clinical Scoring and Severity:

It is found in this study that there is a linear progression between Ranson and MODS clinical scorings and clinical severity of the disease as shown in the line diagrams.

2. Outcome of the Disease

Lesser grades were discharged after clinical cure while higher grades have either been shifted to intensive care or have expired. This is depicted in the bar graphs 1 and 2.

Though the numbers expired appear less in grade E compared to that of grade D, only 5 patients had poor outcome out of total 11 patients while in grade E 4 out of 5 patients had poor outcome which is clinically and statistically significant.

3. Relationship Between Sex and Severity of Disease :

A total of 40 males and 10 females were incorporated in this study. The following table will analyze the sex differences.

Table- 3: Distribution of the Disease in Male and Female

GRADES	TOTAL	MALES	FEMALES
B	20	17	3
C	14	11	3
D	11	8	3
E	5	3	2

It is seen from the above table that the sex difference decreases with increase in severity. That is, as the grade of the disease increases, the incidence of disease is more in females with a poorer outcome.

It was found in my study that alcohol forms the main cause of acute pancreatitis in 30 patients, while 15 patients had biliary tract pathology as the main cause. 4 patients had other miscellaneous causes like usage of steroids or thiazide diuretics, hemochromatosis. One case had malignancy of head of pancreas.

4. Relationship between Aetiopathogenesis and Severity of the Disease:

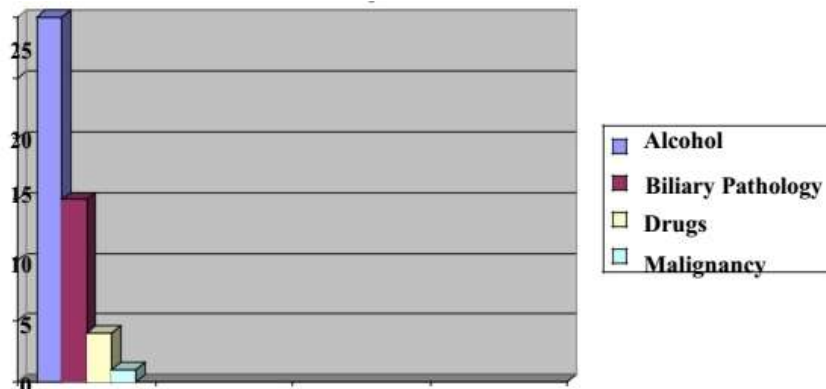


Fig-1: graph showing the aetiology of the disease

Follow Up:

Out of 37 patients who were discharged, 17 patients did not turn up for follow up. Hence a total of 20 patients were followed up during the study period of

3 years. It was found that about 15 of 20 patients who had alcoholic pancreatitis had recurring episodes of the same disease and had repeated hospital admissions. About 5 out of 20 patients who had biliary pathology had recurred and these were due to retained CBD stones.

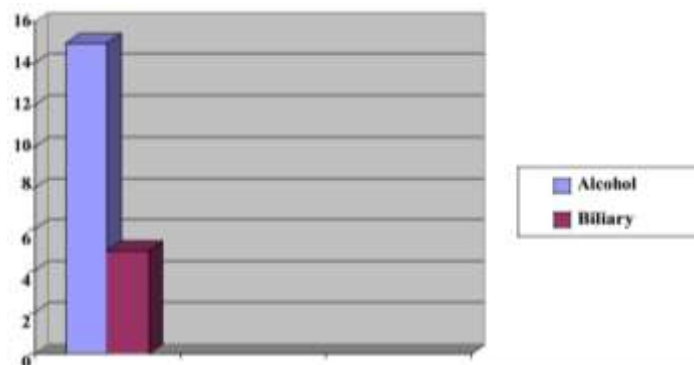


Fig-2: graph showing the follow up of the disease Showing the relation between aetiology and recurrence.

International trials:

Hill *et al* [5] in 1983 conducted a study in which he studied a total of 83 patients. None of the patients in grade A or B died while 17% of D and 61% of E developed infected fluid collections and died.

Claviens and co-workers [6] conducted a prospective evaluation of 176 patients in which he found that grade D and E had a protracted clinical course and developed the most complications.

Balthazar [7] conducted two separate trials and found the CT is both sensitive and specific in assessing the severity of the disease, the scoring named after him.

LIMITATIONS OF STUDY

In my study the outcome of grade D and E patients could not be completely assessed as some of the patients were discharged against medical advice.

- Paediatric group patients were not included in the study.
- Serial follow up with biochemical markers made in my study are less specific after 48 hrs of admission.

EPIDEMIOLOGY

Acute pancreatitis contributes to about 20% of the total cases of acute abdomen that are presented to the emergency unit at CMCH.

- Most of the cases are either under reported or misdiagnosed as acid peptic disease.
- Hence clinician should have a strong suspicion of the disease if other major causes are to be ruled out.
- Available biochemical markers in our hospital are not as reliable to indicate the severity of the disease.
- It is the clinical acumen complemented with biochemical and radiological investigations that arrive at a diagnosis. It is the fourth common cause of acute abdomen presenting to our hospital emergency unit .
- Hence a strong suspicion should be in our mind if a history and clinical presentation warrants

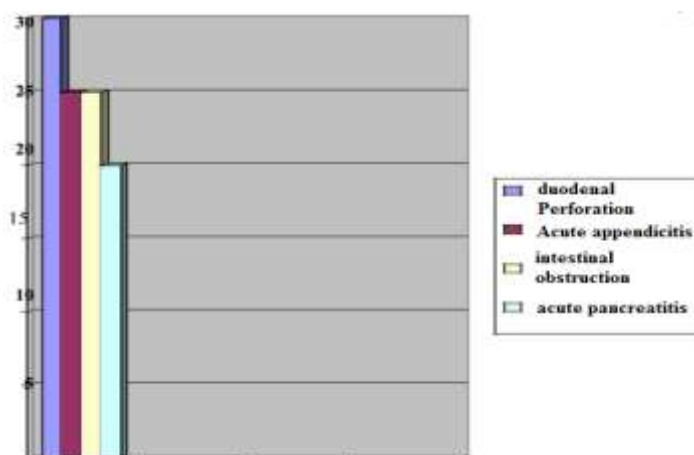


Fig-3: Graph Showing Epidemiology of Acute Abdomen in CMCH

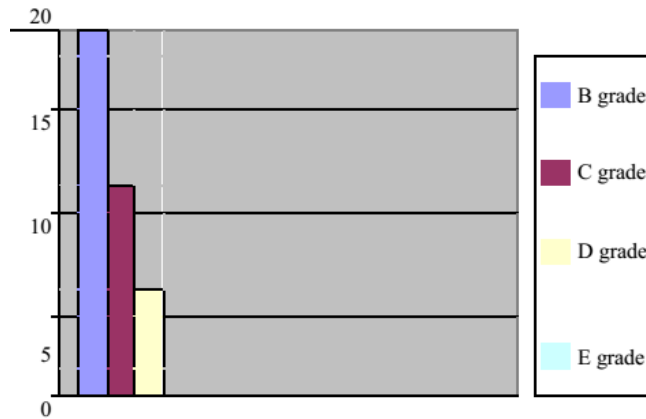


Fig-4: No of patients discharged

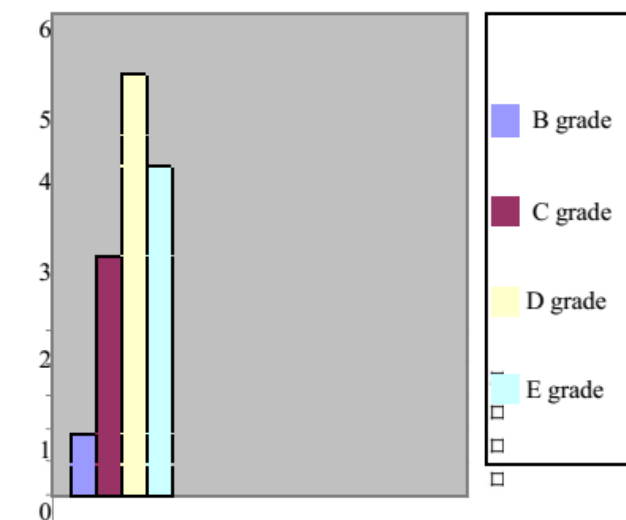


Fig-5: No. of patients requiring intensive care / expired

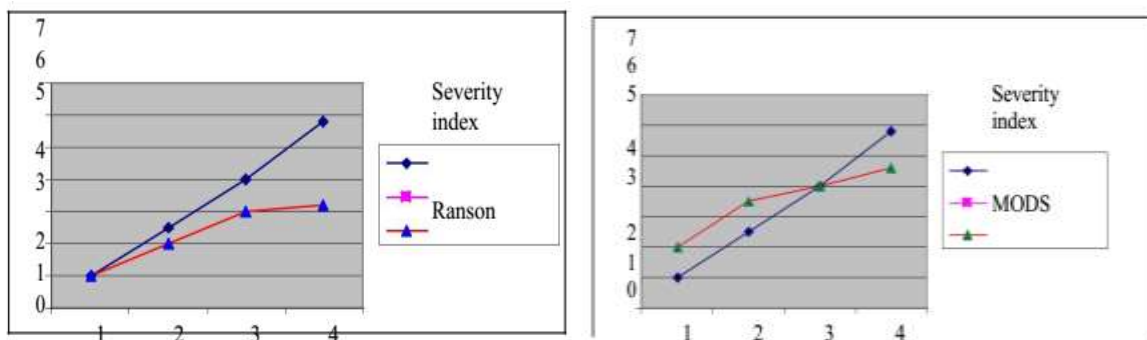


Fig-6: Relationship between clinical Scoring and severity Index

CONCLUSION:

1. CT is an important single imaging modality to evaluate patients with acute pancreatitis.
2. CT plays a critical role in initial process of diagnoses, as an early predictive indicator of disease severity, and in detecting complications associated with acute pancreatitis.
3. CT has a high sensitivity and specificity in diagnoses of moderate and severe forms of pancreatitis and it is used to confirm clinical

diagnosis as well as to detect other intraabdominal catastrophes that may mimic acute pancreatitis.

4. Early CT evaluation allows identification of group of patients at high risk of local complications. These group of patients should be followed up with serial CT examinations and should be monitored closely.

REFERENCES

1. Levitt MD, Eckfeldt JH. Diagnosis of acute pancreatitis. The Pancreas: Biology,

Pathophysiology and Disease 2nd ed. Raven Press, NY. 1993:613-35.

2. Baue AE, Durham R, Faist E. Systemic Inflammatory Response Syndrome (SIRS), Multiple Organ Dysfunction Syndrome (MODS), Multiple Organ Failure (MOF): Are We Winning The Battle?. Shock. 1998 Aug 1;10(2):79-89.
3. Bone RC. A personal experience with SIRS and MODS. Critical care medicine. 1996 Aug 1;24(8):1417-8.
4. Tarzi RM, Lim A, Moser S, Ahmad S, George A, Balasubramaniam G, Clutterbuck EJ, Gedroyc W, Brown EA. Assessing the validity of an abdominal CT scoring system in the diagnosis of encapsulating peritoneal sclerosis. Clinical Journal of the American Society of Nephrology. 2008 Nov 1;3(6):1702-10.
5. Hill MC, Dach JL, Barkin J, Isikoff MB, Morse B. The role of percutaneous aspiration in the diagnosis of pancreatic abscess. American journal of roentgenology. 1983 Nov 1;141(5):1035-8.
6. Clavien PA, Hauser H, Meyer P, Rohner A. Value of contrast-enhanced computerized tomography in the early diagnosis and prognosis of acute pancreatitis: A prospective study of 202 patients. The American journal of surgery. 1988 Mar 1;155(3):457-66.
7. Balthazar EJ, Ranson JH, Naidich DP, Megibow AJ, Caccavale R, Cooper MM. Acute pancreatitis: prognostic value of CT. Radiology. 1985 Sep;156(3):767-72.

Appendixes

CASE PROFORMA

NAME:
AGE:
IP NUMBER:
UNIT:
DATE OF ADMISSION:
COMPLAINTS:
GENERAL EXAMINATION:
 GCS: SPO2:

BP: PR:
 RESPIRATORY RATE:
 TEMPERATURE:
SYSTEMIC EXAMINATION:
INVESTIGATIONS:
 SERUM AMYLASE:

RANSON CRITERIA:

AT ADMISSION:	CRITERIA	SCORE
	AGE:	
	BLOOD GLUCOSE:	
	WCC:	
	LDH:	
	SGOT:	

48 HRS AFTER ADMISSION:

SERUM UREA INCREASE:	HEMATOCRIT DECREASE:
	SERUM CALCIUM:
	FLUID SEQUESTRATION: SPO2:
	BASE DEFICIT:

MODS SCORE:	SCORE
ORGAN SYSTEMS	
Respiratory:	
Renal:	
Hepatic:	
Cardiovascular:	
Central nervous system:	
Hematological:	
USG ABDOMEN:	
CT ABDOMEN:	

MASTER CHART

NAME	AGE	IP NO.	SEX	DOA	DOD/AMA/DEATH	RANSONS CRITERIA	MODS SCORE	CT GRADE	NECROSIS INDEX	SEVERTY INDEX
SHANMUGAM	49	928748	M	6/2/16	11/2/16 – D	0	2	B(1)	0	1
DRAVIDAMA NI	36	928357	M	3/2/16	11/2/16 – D	3	5	D(3)	2	5
ANBALAGAN	44	953849	M	24/8/16	14/9/16 – D	1	3	B(1)	0	1
POOSAIMANI	56	955796	F	8/9/16	20/9/16-D	3	6	C(2)	2	4
ARUNAN	39	957582	M	20/9/16	28/9/17 – D	2	5	C(2)	0	2
SASIKUMAR	31	921600	M	7/12/15	14/12/15 – D	1	1	B(1)	0	1
RAMAIYAN	55	921378	M	7/12/15	14/12/15 – D	1	1	B(1)	0	1
GANESAN	45	92828384	M	3/2/15	12/2/15 – D	1	3	B(1)	0	1
SHANMUGAM	49	928748	M	30/11/15	8/12/15 – D	3	2	C(2)	2	4
THANGAVELU	60	918938	F	18/11/15	2/12/15 – D	1	1	D(3)	0	3
THENMOZHI	32	919807	F	23/11/15	2/12/15 – D	0	2	B(1)	0	1
PURUSHOTHAMAN	27	920070	M	21/11/15	28/11/15- D	1	2	B(1)	0	1
RAJENDRAN	51	919115	M	20/11/15	28/11/15 – D	1	2	B(1)	0	1
KALIYAMOORTHY	55	918997	M	15/11/15	27/11/15 – D	1	2	B(1)	0	1
RAJENDRAN	45	919439	M	17/11/15	24/11/15 – D	2	4	C(2)	1	3
CHINNAYAN	60	918817	M	10/11/15	18/11/15 – D	2	3	C(2)	1	3
CHITRA	45	916367	F	2/11/15	12/11/15 – D	1	2	B(1)	0	1
KARTHIKEYEN	22	915977	M	21/10/15	4/11/15 – D	2	2	B(1)	0	1
SUMATHI	24	915895	F	24/10/15	2/11/15 – D	2	3	C(2)	0	2
MAHALINAGAM	51	915486	M	17/10/15	28/10/16 – D	4	4	D(3)	1	4
SUBRAMANIYAN	55	915980	M	2/10/15	27/10/15 – D	4	5	D(3)	1	4
VADIVEL	75	915085	M	10/10/15	17/10/15 – A	3	5	E(4)	2	6
PANDIYAN	42	912244	M	7/10/15	14/10/15 – D	1	2	B(1)	0	1
GANESAN	45	913345	M	3/10/15	10/10/15 – D	1	2	B(1)	0	1
AMBIKAPATHI	46	910465	M	1/9/15	9/9/15 – A	2	3	C(2)	0	2
PERUMAL	45	908506	M	2/8/15	27/8/15 – D	2	3	D(3)	1	4

KAMARAJ	14	901214	M	13/8/15	26/8/15 – D	2	2	B(1)	0	1
SEKAR	40	907109	M	16/8/15	23/8/15 – A	3	5	D(3)	0	3
KULANDAIE	60	907847	M	10/8/15	22/8/15 – E	3	4	E(4)	2	6
PARAMESWARAN	44	903962	M	16/7/15	22/7/15 – D	1	2	B(1)	0	1
UTHIRAPATH	37	889228	M	11/6/15	27/6/15 – D		3	C(2)	0	2
RAVI	39	900102	M	20/6/15	26/6/15- D		2	B(1)	0	1
RAMAN	69	891611	M	7/6/15	14/6/15		2	B(1)	0	1
BALASUBRAMANIAM	71	889635	M	6/6/15	13/6/15– D		3	C(2)	0	2
SHANMUGA	34	891269	M	5/6/15	11/6/15- A		4	D(3)	1	4
NATARAJAN	51	885265	M	2/5/15	10/5/15- A	2	5	D(3)	1	4
SHANKAR	42	886597	M	1/5/15	7/5/15 – A	2	4	C(2)	0	2
UMARANI	29	885508	F	13/4/15	1/5/15 – D	1	4	C(2)	0	2
KALIYAMORTHY	45	882721	M	7/4/15	14/4/15 – A	3	5	D(3)	1	4
DHARMAR	55	882761	M	2/4/15	9/4/15- D	1	4	B(1)	0	1
SUNDRRAJ	41	880968	M	16/3/15	22/3/15 – E	3	5	E(4)	1	5
VISWANATHAN	38	878340	M	2/3/15	8/3/15 – A	1	2	B(1)	0	1
NATHIYA	19	878136	F	13/2/15	2/3/15 – A	1	2	B(1)	0	1
SELVAM	40	878543	M	11/2/15	2/3/15– A	2	4	C(2)	0	2
THIRUNAVUKKARASU	25	872950	M	2/1/15	20/1/15 - D	1	2	B(1)	0	1
PURUSHOTHAMAN	27	869553	M	13/12/14	26/12/14 – D	1	3	C(2)	0	2
ALAGAR	35	866661	M	3/12/14	13/12/14 – D	3	5	E(4)	2	6
MARIYAMBEEVI	47	866668	F	3/12/14	7/12/14- D	4	4	D(3)	1	4
MARY	22	860677	F	27/9/14	4/10/14– A	3	5	D(3)	1	4
RAJENDRAN	42	855166	M	27/5/14	2/6/14 – A	4	4	E(4)	2	6

D – Discharged / Clinical cure

A – AMA

E – Expired

ANALYSIS CHART

GRADE	MALES	FEMALE	AVERAGE HOSPITAL STAY	AVERAGE RANSON SCORE	AVERAGE MODSSCORE	AVERAGE SEVERITYINDEX
B	17	3	8	1	2	1
C	11	3	9	2	3.5	2.5
D	8	3	8	3	4	4
E	3	2	8	3	4	5.8
TOTAL	40	10				2