Original Article ISSN (O):2395-2822; ISSN (P):2395-2814

Computed Tomography Severity Indices and its Predictive Value in Patient Outcome in Acute Pancreatitis in a Tertiary Care Centre in Northern Kerala

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Received: October 2019
Accepted: October 2019

ABSTRACT

Background: The objectives of this study are to describe the spectrum of Computed Tomography findings in cases of acute pancreatitis and to correlate the Computed Tomography Severity Indices with the clinical outcome of the patient. **Methods:** This descriptive study was done in Department of Radiodiagnosis, Government Medical College, Kannur on patients with suspected acute pancreatitis referred to Department of Radiodiagnosis for Contrast Enhanced Computed Tomography over a period of one year from 1/02/2016 to 31/01/2017. **Results:** 64 patients were studied, and 29 patients had mild, 22 had moderate and 13 had severe pancreatitis according to CTSI. According to MCTSI, 9, 35 and 20 patients had mild, moderate and severe pancreatitis respectively. The sensitivity of CTSI and MCTSI for predicting organ failure was 68.4 % and 94.7 % and specificity 100 % and 95.6 % respectively. The diagnostic accuracy of MCTSI was 95 % compared to 90 % for CTSI. MCTSI has a positive predictive value of 90 % and negative predictive value of 97.7 %. **Conclusions:** Both CTSI and MCTSI are extremely useful in predicting the patient outcome in acute pancreatitis in terms of hospital stay, need for intervention and development of organ failure. However, the sensitivity, negative predictive value and diagnostic accuracy are higher for MCTSI compared to CTSI.

Keywords: Acute pancreatitis; Computed Tomography Severity Index; Modified Computed Tomography Severity Index

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INTRODUCTION

Acute pancreatitis is a process of acute inflammation of the pancreas usually caused by biliary stone, alcohol ingestion, metabolic factors and drugs. It is generally classified into mild and severe forms. Mild pancreatitis (otherwise known as interstitial or edematous pancreatitis) is associated with minimal organ failure and an uneventful recovery.[1] Severe pancreatitis (otherwise called as necrotizing pancreatitis) occurs approximately in 20% of the patients and is associated with organ failure or local complications, including necrosis, infection or pseudocyst formation.[2] The clinical diagnosis is usually established by leucocytosis, elevated serum amylase, serum lipase. A computed tomography (CT) scan confirms the clinical impression of acute pancreatitis.

The assessment of the severity of acute pancreatitis has a significant role in management. Mild pancreatitis responds well to the supportive therapy, whereas severe pancreatitis requires intensive monitoring and specific treatment.[2] The aim of this study is to determine whether Computed Tomography is effective in assessing the severity of acute pancreatitis and in predicting the prognosis and clinical outcome in these patients.

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Background

Acute pancreatitis is an acute inflammation of the pancreas and is a potentially life-threatening condition. The diagnosis of acute pancreatitis is made by fulfilling two of the following three criteria.[3]

1. Acute onset of persistent, severe epigastric pain (i.e. pain consistent with acute pancreatitis)
2. Lipase/amylase elevation >3 times the upper limit of normal
3. Characteristic imaging features on contrast-enhanced CT, MRI, or ultrasound

Causes of pancreatitis are many and can be roughly grouped into the following common ones (gallstones including microlithiasis, alcohol, hypertriglyceridemia, endoscopic retrograde cholangiopancreatography -ERCP, trauma, postoperative, drugs, Sphincter of Oddi dysfunction), uncommon ones (vascular causes and vasculitis, connective tissue disorders, cancer of the

pancreas, periampullary diverticulum, pancreas divisum) and also rare ones (including infections, autoimmune disorders)

Two distinct phases of acute pancreatitis were introduced: an early phase that occurs within the first week of onset of disease; and a late phase that takes place after the first week of onset (3,4). During early phase, pancreatic or peripancreatic ischemia or edema may completely resolve, develop fluid collections or progress to permanent necrosis and liquefaction. Severity of the acute pancreatitis in the early phase is entirely based on clinical parameters. The late or second phase starts from one week onwards. In this stage, the need for treatment is determined by presence of symptoms or complications, and the type of management is mainly based on the morphologic characteristics of pancreatic and peripancreatic region seen on cross sectional imaging.

The web based international consensus revised the original Atlanta classification of 1992 and proposed a new classification of acute pancreatitis to avoid the confusion in terminology seen over the last 2 decades.[3] This consensus classification defines criteria for the diagnosis of acute pancreatitis, differentiates the two types of acute pancreatitis (interstitial edematous pancreatitis and necrotizing pancreatitis) classifies the severity of acute pancreatitis into three categories and defines the morphology seen on imaging of pancreatic and peripancreatic collections that arise as complications of acute pancreatitis.

Table 1: Indications to perform contrast-enhanced computed tomography[5]

Types	Indications
Initial imaging	1. When the diagnosis of acute pancreatitis is uncertain 2. Patients with hyperamylasemia, severe clinical pancreatitis, abdominal distention and tenderness, fever > 102°, and leukocytosis for the detection of complications 3. Ranson score > 3 or APACHE score > 8. 4. Patients who fail to improve after 72 h of conservative medical therapy. 5. Acute change in clinical status, such as new fever, pain, and shock after successful initial medical therapy
Follow up imaging	1. Acute change in clinical status suggesting complication. 2. 7-10 d after presentation if CT severity score is 3-10 at presentation or grade. 3. To determine response to treatment after surgery or interventional radiologic procedures to document response to treatment. 4. Before discharge of patients with severe acute pancreatitis

Role of Imaging in Acute Pancreatitis

The imaging modality is chosen depending on the clinical presentation, timing of onset of symptoms and laboratory data, CECT continues to be the most commonly used modality for the evaluation of acute pancreatitis.

Morphologic Types Of Acute Pancreatitis And Definition Of Terminology[6-9]

Interstitial edematous pancreatitis (IEP)

Interstitial edematous pancreatitis is the milder form of acute pancreatitis that usually resolves over the first week. It is characterized by diffuse or localized enlargement of the pancreas secondary to interstitial or inflammatory edema without necrosis.

On CECT, findings include enlarged pancreas with comparatively normal enhancement. Peripancreatic fat may be normal or show mild stranding due to inflammation, with varying amounts of peripancreatic fluid. The characteristic CECT finding that distinguishes interstitial edematous pancreatitis is absence of pancreatic parenchymal and peripancreatic necrosis.

Necrotizing pancreatitis

Necrotizing pancreatitis is pancreatic inflammation with parenchymal and peripancreatic tissue necrosis.

On CECT, findings include compromised enhancement of pancreatic parenchyma on the post-contrast images with or without inhomogeneous peripancreatic fluid collections. This impairment of pancreatic perfusion and peripancreatic necrosis evolve over several days and is the reason why an early CECT may underestimate the extent of pancreatic and peripancreatic necrosis.

Acute peripancreatic fluid collections (APFC)

Acute peripancreatic fluid collections are fluid collections less than 4 weeks old in interstitial pancreatitis that lacks a discrete wall, with no solid components in the peripancreatic region. Approximately 50% of them develop within 48 hours following the onset of acute pancreatitis. On CT scan, they appear as low attenuating homogenous collections and do not have well-defined walls. Most acute fluid collections remain sterile and resolve spontaneously without intervention.

Pancreatic pseudocysts

Pseudocysts are peripancreatic fluid collections that last for more than 4 weeks in interstitial edematous pancreatitis, with well-defined wall and absence of solid components in the peripancreatic region.

On CECT, they are low attenuating homogenous collections surrounded by a uniform enhancing capsule. Pseudocysts may have communication with pancreatic duct occasionally. Simple pseudocysts may be complicated by infection and hemorrhage. Gas bubbles may be seen in infected pseudocyst on CT. However, absence of these findings on CT

needs confirmation by fine needle aspiration if there is a strong clinical suspicion.

Acute necrotic collections (ANC)

Acute necrotic collection is a collection containing varying amounts of fluid and necrotic tissue during the first 4 weeks. Unlike APFCs, ANCs are present within the pancreas and peripancreatic regions. ANC's often maintain communication with the main pancreatic duct or its side-branches.

On CECT, ANC's show heterogeneous attenuation variably higher than that of thin fluid. CECT often demonstrates ANC's as a homogenous non-enhancing area during the first week of necrotizing pancreatitis; making it difficult to be differentiated from APFC's. MRI may be helpful for confirmation of the presence of solid component in the collection.

Walled-off necrosis (WON)

After 4 weeks, APFC's mature and develop thick non-epithelialized wall; referred to as walled-off necrosis. They commonly occur in the body and tail of pancreas.

On CECT, walled-off necrosis demonstrates a heterogeneous fluid and non-fluid attenuation with varying amounts of loculations surrounded by a well-defined and enhancing wall; which can involve both the pancreatic and extrapancreatic tissue.

Infected pancreatic necrosis

Pancreatic and peripancreatic necrosis may become infected. There is increased morbidity and mortality with development of secondary infection (10).

The diagnosis of infected acute necrotic collections or walled off necrosis can be suspected in the presence of extraluminal gas on CT or MRI. This extraluminal gas is present in areas of necrosis and may or may not form a gas/fluid level depending on the amount of fluid content present at that stage of the disease. The diagnosis may be confirmed by aspiration and analysis including microscopy and culture.

Severity of Acute Pancreatitis

Clinical versus CT scoring systems

In the last two decades, radiological scoring systems were developed for accurate diagnosis and correlation of complications in acute pancreatitis. In 1990, Balthazar et al (11) introduced the CT severity index for assessment of acute pancreatitis; which correlated well with morbidity, mortality and length of hospital stay. One limitation of this index was the score obtained did not incorporate the presence of organ failure (12) or peripancreatic vascular complications or extra pancreatic parenchymal complications (13,14)and their correlation with the final outcome. MCTSI introduced by Mortele et al (15) in 2004 to account for the limitations of CTSI; which showed improved correlation with severity.

Table 2: Scoring systems for acute pancreatitis

Pancreatic characteristics	CTSI(0-10)	Modified CTSI(0–10)
Pancreatic inflammation		
Normal pancreas	0 (A)	0
Focal/diffuse enlargement of pancreas	1 (B)	2
Peripancreatic inflammation	1 (B)	2
Single acute fluid collection	2 (C)	4
Two or more acute fluid collection	4 (E)	4
Pancreatic necrosis		
None	0	0
Less than 30%	2	2
Between 30% and 50%	4	4
More than 50%	6	4
Extrapancreatic complicationsa	0	2

[a]Including pleural effusion, ascites, vascular, parenchymal and gastrointestinal tract complications

MATERIALS & METHODS

Type of Study:

A hospital based descriptive study

Source of Data:

This descriptive study was done in Department of Radiodiagnosis, Government Medical College, Pariyaram, Kannur. This study comprises of 64 patients with suspected acute pancreatitis referred to Department of Radiodiagnosis for Contrast Enhanced Computed Tomography.

Selection Criteria

Inclusion criteria:

Patients admitted with clinical suspicion of acute pancreatitis who underwent contrast enhanced computed tomography.

Exclusion criteria:

Pancreatitis due to trauma, patients not giving informed consent

Technique

All patients were evaluated with Contrast Enhanced Computed Tomography and findings were correlated with follow up evaluations or surgical findings wherever applicable.

All scans were done using GE Hi-speed dual-slice MDCT with 120 KVp and 300 mAs with 5 mm slice thickness. Bolus tracking method is used for post contrast scan with the tracker placed in the descending aorta at the level of dome of diaphragm.70-80 ml of 350mg/ml nonionic iodinated contrast (IOHEXOL) was injected using pressure injector at the rate of 3-4 ml/sec. Threshold set at 150 Hounsfield units(HU) and delay of 3 seconds was given after the attainment of threshold for arterial phase. Venous phase acquired after a delay of 60 seconds from the time of contrast injection. Scanning was done in cranio-caudal direction in arterial and venous phases; from the

level of diaphragm to aortic bifurcation in the arterial phase and from the level of diaphragm to the level of pubic symphysis in the venous phase. Images were retro reconstructed with 1 mm slice thickness and reformatted in sagittal and coronal planes for analysis.

The severity of pancreatitis was scored using modified and original Computed Tomography severity index and classified into three categories (mild, moderate and severe). The modified index is a 10-point scoring system derived by assessing the degree of pancreatic inflammation (0 to 4 points) pancreatic necrosis (0 to 4 points) and extrapancreatic complications (0 or 2 points). Clinical outcome parameters included the length of hospital stay, the need for surgical intervention and the occurrence of infection, organ failure and death.

RESULTS & DISCUSSION

This study comprised of 64 patients with suspected acute pancreatitis who underwent contrast enhanced computed tomography in Government Medical College, Pariyaram, Kannur, during the study period of one year from 01/02/2016 to 31/01/2017. The age of the patients ranged from 12 years to 85 years. The maximum number of patients were in the 30-39 range (27 patients, 42%). According to the study by Irshad Ahmad Banday et al,[16] the maximum number of patients were in the 40-50 years range (42%). Out of the 64 patients, 45 were male (70.3 %) and 19 were female (29.7 %). This is similar to study conducted by P. Sonwalkar et al,[17] where 72.3 % of the patients were males and 27.7 % were females. This does not correlate with study by Amna Rehan et al,[18] where majority of patients were females (60.8 %).

The cause of acute pancreatitis remained unidentified in 27 patients. Among identified causes, alcohol accounted for the 39.1 % (25 patients) and gall stones comprised 18.8 % (12 patients). Abdominal pain, predominantly in the epigastrium was the most common symptom, present in 100 % of the patients. Next common symptom was vomiting found in 42 patients (65%). Fever was present in 12 patients and diarrhea in 5 patients. This correlates with the study done by P. Sonwalkar et al,[17] where abdominal pain and vomiting were seen in 100 and 85 % respectively.

The patients were categorized into having mild, moderate and severe pancreatitis according to CTSI and MCTSI. Based on computed tomography findings, 40 patients had edematous/ interstitial pancreatitis (62.5 %) and 24 (37.5 %) had necrotizing pancreatitis. In the study by Biswanath Sahu et al,[19] interstitial or edematous pancreatitis comprised 46.7 % and necrotizing pancreatitis 50 %. Out of the 24 patients with necrotizing pancreatitis, 13 had necrosis less than 30 % and 11 had necrosis more than 30 %. Normal pancreas was seen in 3 patients (4.6 %). 26 patients (40.6%) had intrinsic pancreatic abnormalities with or without inflammatory changes in peripancreatic fat and 35 patients (54.6 %) had pancreatic or peripancreatic fluid collection or peripancreatic fat necrosis. According to the study done by P. Sonwalkar et al (17), normal pancreas, intrinsic pancreatic abnormalities, pancreatic or peripancreatic fluid collection or peripancreatic fat necrosis was found in 4.3 %, 51.1 % and 44.7 % respectively.

Extrapancreatic complications were seen in 90 % (58 cases). This was high compared to the study done by Thomas.L.Bollen et al,[3] (56%) and by P. Sonwalkar et al,[17] (59.6 %).

The most common extra-pancreatic complication in the study was pleural effusion, found in 42 patients (65%). The next common complication was ascites, seen in 36 patients (56%). Vascular complications were present in 3 and gastrointestinal complications in 6 patients. One patient had pancreaticopleural fistula. This correlates well with the study done by Irshad Ahmad Banday et al,[16] where pleural effusion was the most common complication, seen in 56 %. Ascites was present in 36 % according to their study. Pleural effusion was the most common complication (in 50 %) followed by ascites in the study done by Biswanath Sahu et al.[19]

According to CTSI, mild pancreatitis was found in 29 patients, moderate in 22 and severe in 13 patients. According to MCTSI, 9 patients had mild pancreatitis, 35 had moderate and 20 had severe pancreatitis. 20 patients who were classified as mild according to CTSI was classified as having moderate pancreatitis according to MCTSI. Also 7 patients with moderate pancreatitis according to CTSI had severe pancreatitis according to MCTSI.

The duration of hospital stay ranged from 3 to 22 days in the present study. The mean duration of hospital stay in mild, moderate and severe pancreatitis according to CTSI was 5.2, 8.7 and 15.2 days respectively and according to MCTSI was 3.2, 6.5 and 14.6 days respectively. This difference is statistically significant with a test value of 119.661 and p value of <0.001. Posthoc Tukey tests comparing mild acute pancreatitis and moderate acute pancreatitis groups shows a mean difference of -3.321 and is statistically significant with a p value of 0.002. Comparing mild acute pancreatitis and severe acute pancreatitis groups shows a mean difference of -10.936 and is statistically significant with a p value of <0.001. Comparing moderate acute pancreatitis and severe acute pancreatitis groups shows a mean difference of -7.615 and is statistically significant with a p value of <0.001. These results are comparable with the study done by Prem Chand et al,[20] were the mean duration of hospital stay was 5.3, 6.8 and 10 days for patients with mild, moderate and severe pancreatitis respectively.

7 patients (10.9 %) required interventional procedures in our study. This is similar to the studies

done by Thomas. L. Bollen et al,[3] and Lipee Nath et al,[21] were the need for intervention was 10 % and 13 % respectively.

All the 7 patients were having severe pancreatitis according to MCTSI and 4 were having severe and 3 having moderate pancreatitis according to CTSI. 29.6 % (19 patients) in our study developed organ failure. The percentage of patients who developed organ failure was less compared to study done by Biswanath Sahu et al,[19] (41.7%) and more compared to the study done by Thomas.L.Bollen et al,[3] (19%). The most common complication was respiratory failure (11 patients) followed by renal (8 patients) and cardiac (3 patients) failure. Multiorgan failure was seen in 3 patients. Out of the 19 patients, 18 patients were having severe pancreatitis according to MCTSI and 1 patient was having moderate pancreatitis according to MCTSI. Of the 19 patients who developed organ failure, 13 had severe and 6 had moderate pancreatitis according to CTSI. One patient (1.5 %) died during the study. This patient had severe pancreatitis according to both CTSI and MCTSI. This correlates with the study done by Lipee Nath et al,[21] were 1.7 % of patients expired. Death occurred in 6 % of patients in the study done by Thomas.L.Bollen et al.[3] On comparison of the test group CTSI (cutoff severe) with the Gold standard of organ failure the test group has a sensitivity of 68.4 % and specificity of 100%. The test has a positive predictive value of 100% and Negative predictive value of 88.2%. The test and the gold standard agree on 58 out of 64 having a diagnostic accuracy of 90.625%. The Kappa value of 0.753 indicates very good agreement with a p value of <0.001. On comparison of the test group MCTSI (cutoff severe) with the Gold standard of organ failure the test group has a sensitivity of 94.7 % and specificity of 95.6%. The test has a positive predictive value of 90% and Negative predictive value of 97.7%. The test and the gold standard agree on 61 out of 64 having a diagnostic accuracy of 95.3125%. The Kappa value of 0.889 indicates excellent agreement with a p value of <0.001.

The MCTSI had a sensitivity of 100 %, specificity of 87 % according to the study by Amna Rehan et al. The positive predictive value, negative predictive value and accuracy were 81.3 %, 100 % and 91.6 % respectively. According to the present study, the sensitivity of MCTSI (94.7 %) for detecting severe pancreatitis was significantly higher compared to CTSI (68.4 %). However, the specificity of CTSI was 100 % compared to that of MTCSI (95.6 %). The diagnostic accuracy of MCTSI was 95 % vs 90 % for CTSI.

Thus, MCTSI is an important tool in assessing the severity of acute pancreatitis and predicting the patient outcome in terms of hospital stay, need for intervention and development of organ failure.

Table 3: Demography, clinical features and gross imaging characteristics of the sample size

Characteristics	Number of cases (%)
Males	45 (70.3%)
Females	19(29.7%)
Median age range	30-39 years (27 patients, 42%).
Major etiology	
Alcohol	25 patients (39.1%)
Gall stones	12 patients (18.8%)
Unidentified	27 patients (42.2%)
Common symptoms	
Abdominal pain	64 patients (100%)
Vomiting	42 patients (65%)
Fever	12 patients (18.7%)
Diarrhea	5 patients (7.8%)
Imaging features	
Normal	3 patients
Edematous/ interstitial pancreatitis	40 patients (62.5 %)
Necrotizing pancreatitis	24 patients (37.5 %)
Necrosis less than 30 %	13 patients
Necrosis more than 30 %.	11 patients
Intrinsic pancreatic abnormalities with or without inflammatory changes in peripancreatic fat.	26 patients (40.6%)
Pancreatic or peripancreatic fluid collection or peripancreatic fat necrosis.	35 patients (54.6 %)
Extrapancreatic complications	58 patients (90 %)

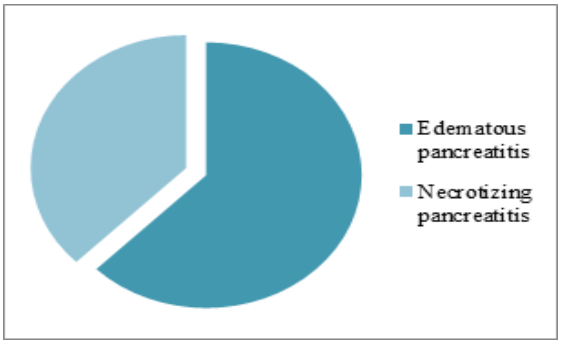

Figure 1: Types of Pancreatitis

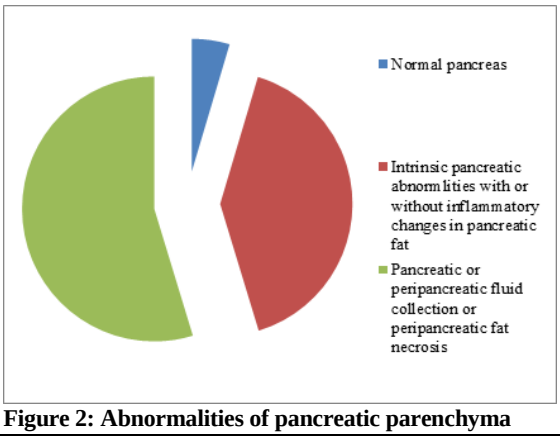

Figure 2: Abnormalities of pancreatic parenchyma

Table 4: Classification of acute pancreatitis

	Mild	Moderate	Severe
CTSI	29	22	13
MCTSI	9	35	20

Table 5: Days of hospital stay as per the CT indices

			Mild pancreatitis		Moderate pancreatitis		Severe pancreatitis		Total	
			CTSI	MCTSI	CTSI	MCTSI	CTSI	MCTSI	CTSI	MCTSI
Days of hospital stay	<=5	Count	16	9	3	10	0	0	19	19
		Percentage value	55.2%	100.0%	13.6%	28.6%	0.0%	0.0%	30.2%	30.2%
	6-10	Count	13	0	12	24	0	1	25	25
		Percentage value	44.8%	0.0%	54.5%	68.6%	0.0%	5.3%	39.7%	39.7%
	11-15	Count	0	0	6	1	8	13	14	14
		Percentage value	0.0%	0.0%	27.3%	2.9%	66.7%	68.4%	22.2%	22.2%
	>=15	Count	0	0	1	0	4	5	5	5
		Percentage value	0.0%	0.0%	4.5%	0.0%	33.3%	26.3%	7.9%	7.9%
Total		Count	29	9	22	35	12	19	63	63
		Percentage value	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests of CTSI			Chi-Square Tests of MCTSI	
	Value	P value (sig if <0.05)	Value	P value (sig if <0.05)
Fisher's Exact Test	45.567	<0.001	66.512	<0.001
Number of Valid Cases	63		63	

Table 6: Need for intervention as per CT indices

			Mild pancreatitis		Moderate pancreatitis		Severe pancreatitis		Total	
			CTSI	MCTSI	CTSI	MCTSI	CTSI	MCTSI	CTSI	MCTSI
Need for intervention	No	Count	29	9	19	35	9	13	57	57
		Percentage value	100.0%	100.0%	86.4%	100.0%	69.2%	65.0%	89.1%	89.1%
	Yes	Count	0	0	3	0	4	7	7	7
		Percentage value	0.0%	0.0%	13.6%	0.0%	30.8%	35.0%	10.9%	10.9%
Total		Count	29	9	22	35	13	20	64	63
		Percentage value	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests of CTSI			Chi-Square Tests of MCTSI	
	Value	P value (sig if <0.05)	Value	P value (sig if <0.05)
Fisher's Exact Test	8.788	<0.001	14.370	<0.001
Number of Valid Cases	64		64	

Table 7: Organ failure as per CT indices

			Organ failure					
CTSI & MCSTI (CUTOFF SEVERE)			Absent CTSI	Present CTSI	Absent MCTSI	Present MCTSI	Total CTSI	Total MCTSI
	Mild/ Moderate	Count	45	6	43	1	51	44
		% within the applied scoring system	88.2%	11.8%	97.7%	2.3%	100%	100%
		% within organ failure	100%	31.6%	95.6%	4.3%	79.7%	68.8%
	Severe	Count	0	13	2	18	13	20
		% within the applied scoring system	0.0%	100%	10.0%	90.0%	100%	100%
		% within organ failure	0.0%	68.4%	4.4%	94.7%	20.3%	31.2%
Total		Count	45	19	45	19	64	64
		% within the applied scoring system	70.3%	29.7%	70.3%	29.7%	100%	100%
		% within organ failure	100%	100%	100%	100%	100%	100%

Table 8: Sensitivity, specificity, positive and negative predictive value for MCTSI and CTSI based on development of organ failure.

Parameter	Sensitivity	Specificity	Positive predictive value	Negative predictive value	Diagnostic accuracy	p value
CTSI (cutoff severe)	68.40%	100.00%	100.00%	88.20%	90.63%	<0.001
MCTSI (cutoff severe)	94.70%	95.60%	90.00%	97.70%	95.31%	<0.001

Figure 3: Axial section of CECT abdomen showing mildly bulky pancreas with mild peripancreatic fat stranding.

Figure 4: Axial section of CECT abdomen showing necrotizing pancreatitis.

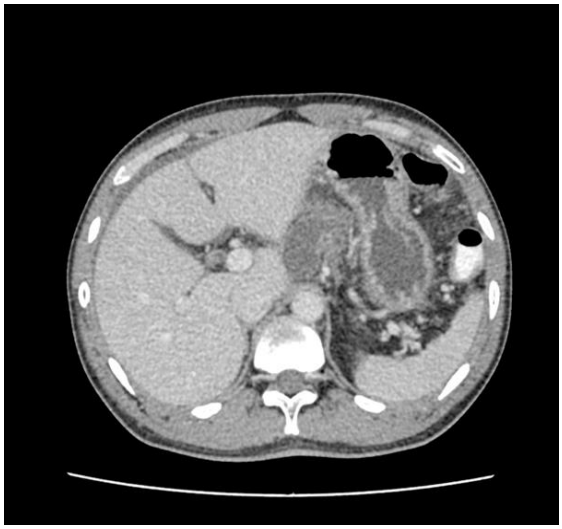

Figure 5: Axial section of CECT abdomen showing acute fluid collection in lesser sac in acute pancreatitis.

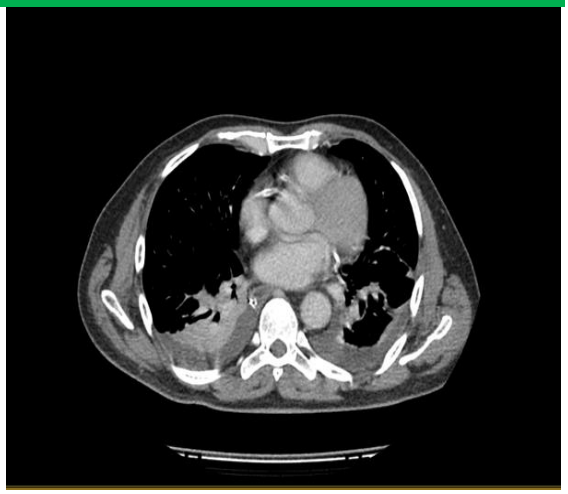

Figure 6: Axial section of CECT abdomen showing bilateral pleural effusion with underlying lung collapse in acute pancreatitis.

Figure 7: Axial section of CECT abdomen showing ascites as complication of acute pancreatits.

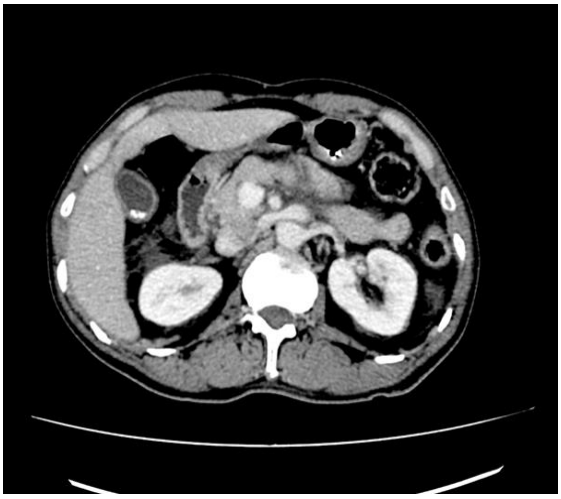

Figure 8: Axial section of CECT abdomen showing gall stone pancreatitis.

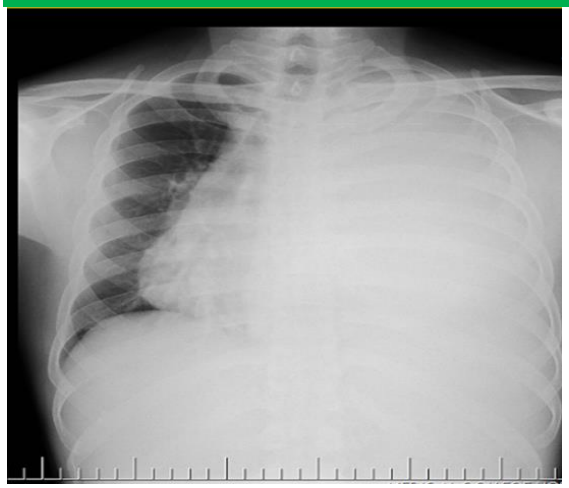

Figure 9: Frontal radiograph of chest showing massive left pleural effusion secondary to pancreaticopleural fistula.

CONCLUSION

Both CTSI and MCTSI are useful in predicting the patient outcome in acute pancreatitis in terms of hospital stay, need for intervention and development of organ failure. The sensitivity, negative predictive value and diagnostic accuracy is higher for MCTSI compared to CTSI, while CTSI has a higher specificity and positive predictive value for diagnosing severe acute pancreatitis.

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How to cite this article: Jinu CK, Prasad A, Kavya MK. Hepatobiliary, Computed Tomography Severity Indices and its Predictive Value in Patient Outcome in Acute Pancreatitis in a Tertiary Care Centre in Northern Kerala. Ann. Int. Med. Den. Res. 2019; 5(6):RD13-RD20.

Source of Support: Nil, **Conflict of Interest:** None declared