

**Role of CT Scan in Evaluation of Pancreatic Lesions****Dr. Abhijit Patil<sup>1</sup>, Dr. Smita V. Valekar<sup>2\*</sup>, Dr. Amit Deshmukh<sup>1</sup>, Dr. Harshal Tukaram Pandve<sup>3</sup>**<sup>1</sup>Dept. of Radiology, Krishna Institute of Medical Sciences, Karad, Maharashtra, India<sup>2</sup>Dept. of Community Medicine, Smt. Kashibai Navale Medical College, Narhe, Pune, Maharashtra, India<sup>3</sup>Dept. of Community Medicine, ESIC Medical College, Sanathnagar, Hyderabad, India**Original Research Article****\*Corresponding author**  
*Dr. Smita V. Valekar***Article History***Received: 20.05.2018**Accepted: 27.05.2018**Published: 30.05.2018***DOI:**

10.21276/sjams.2018.6.5.71



**Abstract:** Computed tomography (CT) is highly accurate, non-invasive imaging modality of choice in evaluating the pancreas. To assess the role of spiral CT in evaluation of pancreatic lesions. To compare imaging findings with some socio-demographic variables. This Cross-sectional Study was carried out Department of Radiology in Tertiary Care Hospital in Western Maharashtra, India. Convenient sample of 50 study subjects who had fulfilled the inclusion criteria. At first patient suggestive of pancreatic mass were evaluated by detailed clinical history and clinical examination. Subsequently CT scan was done in all clinically suspected patients of pancreatic lesion. CT scans were reviewed to detect pancreatic lesion as well as to characterise them into either diseases or masses by looking radiological signs. Statistical Analysis for descriptive statistics mean, standard deviation, percentages and proportion were used. Chi square test and Fischer's exact probability test were used as a test of significance. Total 50 study subjects participated in the study. Pancreatic disorders were more common in males than in females. In the present study 35 (70%) were males and 15 (30%) were females. The commonest age group affected was between 20-40 years. The commonest pancreatic pathology in this study was acute pancreatitis followed by chronic pancreatitis and pancreatic carcinoma respectively. Computed Tomography is efficacious in detection and characterizing pancreatic pathologies. Pancreatic disorders were common in males than in females commonest age group affected was between 20-40 years. The commonest pancreatic pathology was acute pancreatitis.

**Keywords:** Pancreatic Lesions, CT Scan, Socio-demographic Characteristics.

**INTRODUCTION**

Computed tomography (CT) is highly accurate, non-invasive imaging modality of choice in evaluating the pancreas enables the imaging of entire pancreas easily from surrounding fat and bowel air together with simultaneous imaging of other abdominal organs. It also enables detection of unsuspected additional or ancillary abnormalities which may be responsible for clinical manifestation. The pancreas was one of the last organs in the abdomen to receive attention of the anatomist, physiologist, physicians and surgeons. Located in the "straggling mesenchyme" of the retro peritoneum the pancreas has been called the "hidden" organ or "hermit" of the abdomen in the past. The pancreas was first described in "Talmud" and depicted as "finger projection of liver" between 2000 B.C. and 2000 A.D. Rophos named this organ pancreas (greek: pan-all kreas-flesh) shortly thereafter. More than a millennium passed before anatomic descriptions were completed [1].

Lesions of pancreas have very variable presentation and imaging plays important role in

diagnosis and management of pancreatic diseases. Modalities for imaging pancreas range from plain x-ray to ultrasonography (USG), endoscopic ultrasound, endoscopic retrograde cholangio-pancreaticography (ERCP), computed (CT) and magnetic resonance imaging (MRI).

USG and abdominal CT are most commonly used diagnostic imaging modalities for evaluation of pancreas. But USG is of limited value in patients who are obese and in whom there is extensive bowel gas. CT is modality of choice for non-invasive imaging of pancreas because it is unaffected by bowel gas or large body habitus. CT is more accurate and sensitive than USG in both diagnosing and demonstrating the extent of pseudocysts of pancreas [2]. CT is a key diagnostic tool in understanding the cause of endocrine and exocrine pancreatic insufficiency [3].

**OBJECTIVES**

- To assess the role of spiral CT in evaluation of pancreatic lesions.

- To compare imaging findings with some socio-demographic variables.

**MATERIALS & METHODS**

**Study design**

Cross-sectional Analytical Study

**Period of study:** Jan 2015 to Dec 2016

**Study Area**

Department of Radiology in Tertiary Care Hospital

**Sample Size**

Convenient sample of 50 is taken as in a one month on an average 50 patients comes for CT Scan of which approximately 1 or 2 patients comes for Abdominal CT Scan

**Sampling Unit**

Patients attending Medicine OPD for Pancreatic Lesions

**Inclusion Criteria**

- Clinical history and laboratory criteria suggestive of pancreatic disease
- Finding of pancreatic pathology noted on other imaging modalities especially ultrasound

Written Informaed consent is obtained from all study subjects

**Study Technique**

At first patient suggestive of pancreatic mass were evaluated by detailed clinical history and clinical examination. Subsequently CT scan was done in all clinically suspected patients of pancreatic lesion. CT

scans were reviewed to detect pancreatic lesion as well as to characterise them into either diseases or masses by looking radiological signs. This study was performed using a 16 slice multi detector CT (Somatom, Siemens Healthcare; Germany). Low residue diet was prescribed 24 h before the procedure and the patient was instructed to come to CT unit after completing fasting for about 4-6 hours before examination. Reassurance and brief explanation of the procedure to the patient were given. All patients were examined in supine position. After explaining the possibility of contrast reaction Oral conthast (30 ml of diatrizoate sodium diluted in 1 liter of water) 600-800 ml was administered to patient 45 min prior to scan.

Contrast scan were obtained by injectin 1.5 ml/kg of INj. Lopamiro (370) at a rate of 3 ml per second using a pressure injector via 20G angiocath placed in antecubital vein.

All the other relevant data were collected from the history sheet, investigation papers. Computed Tomography findings were recorded in a structured data collection sheet.

**Data Analysis**

Using computer software statistical package for social sciences (SPSS) data were processed and analyzed. The test statistics were used to analyse the data for descriptive statistics, Chi-square test or Fischer’s exact probability test for comparison of data presented in categorical scale. The level of significance was set at 0.05 and  $p < 0.05$  were considered as significant.

**RESULTS & DISCUSSION**

Total 50 patients CT scan was done.

**Table-1: Socio-demographic Determinants of Study Subjects**

Socio-demographic Variables	Frequency (%)	
Age Group	10-20	6 (12%)
	21-30	13 (26%)
	31-40	9 (18%)
	41-50	7 (14%)
	51-60	7 (14%)
	61-70	6 (12%)
	>70	2 (4%)
Sex	Male	35 (70%)
	Female	15(30%)

**Table-2: Distribution of patients according to pancreatic disorders evaluated by CT Scan**

Pathology	Frequency (%)
Acute Pancreatitis	23 (46%)
Chronic Pancreatitis	14 (28%)
Pancreatic Carcinoma	12 (24%)
Congenital lesion	1 (2%)

**Table-3: Association of Socio-demographic variables with pancreatic pathologies**

Pathology on CT Evaluation	Socio-demographic Variable	Yes	No	Chi-Square Value (d.f)	P Value	
Acute Pancreatitis	Age group	10-20	2	4	11.809 (4)	0.02 <b>S</b>
		21-30	9	4		
		31-40	5	4		
		41-50	5	2		
		51-60	0	7		
		61-70	2	4		
		>70	0	2		
	Sex	Male	20	15	4.432 (1)	0.04 <b>S</b>
		Female	3	12		
Chronic Pancreatitis	Age group	10-20	2	4	2.628 (4)	0.62 <b>NS</b>
		21-30	4	9		
		31-40	3	6		
		41-50	3	4		
		51-60	2	5		
		61-70	0	6		
		>70	0	2		
	Sex	Male	12	23	1.365 (1)	0.24 <b>NS</b>
		Female	2	13		
Pancreatic Carcinoma	Age group (< 40 or > 40)	10-20	2	4	7.925 (1)	0.005 <b>S</b>
		21-30	0	13		
		31-40	0	9		
		41-50	0	7		
		51-60	7	0		
		61-70	1	5		
		>70	2	0		
	Sex	Male	2	33	18.176 (1)	<0.001 <b>HS</b>
		Female	10	5		

\*S – Significant      NS – Not significant      HS – Highly significant

Pancreatic disorders were more common in males than in females; The commonest age group affected was between 20-40 years (Table-1).

The commonest pancreatic pathology in this study was acute pancreatitis followed by chronic pancreatitis and pancreatic carcinoma respectively (Table-2).

Acute pancreatitis is the most of patients are in the middle age group of 20- 50 years; Male are commonly affected than female; the association between age group & sex with acute pancreatitis showed statistically significant (Table-3).

Gaston Mendex Jr. *et al.*, [4] also showed in their study that maximum patients were male as compare to female. Alcohol (70%) is commonest etiological factor for acute pancreatitis followed by cholelithiasis (9%) Trauma (4%) was least causative factor.

Gaston Mendex Jr. *et al.*, [4] also found out in their study as alcohol is commonest factor for acute pancreatitis. Diffuse enlargement (61%), regular contour (61%), homogenous density (70%) was commonly observed in acute pancreatitis. Peri-

pancreatic fluid accumulation (48%), pseudocyst (48%), ascites (50%), pleural effusion (48%) were common extrapancreatic manifestation of acute pancreatitis.

Michael C. Hill *et al.*, [5] conducted a study on 91 patients also showed diffuse enlargement in maximum patients whereas J Haga *et al.*, [6] showed focal enlargement as a main finding in their study. Mild grade (0-2) (48%) modified CT severity index was commonly observed than moderate and severe grade.

Chronic pancreatitis is Male are more commonly affected than female; the association between age group & sex with the chronic pancreatitis did not found statistically significant. (Table-3). Pancreatic ductal dilatation (71%), parenchyma calcification (62%), pseudocyst (71%), alteration in peri-pancreatic fat (57%) were commonest signs observed in chronic pancreatitis followed by atrophic pancreas.

Patrick Luetmer *et al.*, [7] also showed in their study that dilatation of the main pancreatic duct 68% was the most common finding whereas F. Kolmannskog, *et al.*, [8] showed pancreatic

calcification was the commonest finding found in association with other signs which was noted in 19 patients out of 24 chronic pancreatitis patients

Wyatt S and Fishman E K [9] reported that spiral CT has an important role in chronic pancreatitis because of its ability to increase the conspicuity of the pancreatic and biliary ducts against a markedly enhanced parenchyma. Most of pseudocysts are located in body and tail region of pancreas followed by head. Most of pseudocysts are located in peri-pancreatic region.

Pancreatic carcinoma is the fifth most common cause of cancer deaths and accounts for approximately 3 % of all cancers. As most patients of pancreatic neoplasm present with inoperable tumours widespread use of non-operative methods for relieving obstructive jaundice in patients with non resectable tumours in the pancreatic head and periaampullar regions has put greater demand on CT. In the pre-treatment evaluation in these patients to determine resectable from unresectable tumours [10]. Most of patients are in older age group (>50 years); this also showed statistically significant association with pancreatic carcinoma.

Female were more affected than male; this showed highly statistically significant association with pancreatic carcinoma. Focal enlargement was more common than diffuse enlargement with commonest involvement of head (42%) followed by body of pancreas (33%). Hypo-dense mass (67%) was more common than iso/heterogeneous mass (16% each) on NECT.

Partric Freeny *et al.*, [11] also showed pancreatic mass in 96% patients with the mass being focal in 95% and diffuse in 5%; Of the focal masses (62%) maximum were in the head. Heterogeneous enhancement was commonly observed on CECT. Most tumours (58%) were detected in early stage <3 cm in size whereas E.A. Eelkema *et al.*, [12] showed A mass was in 25 patients (96%) of average size of 3-24 cm with 8 tumours (31%) being larger than 10 cm. Dilatation of pancreatic duct, atrophy of distal gland, calcifications were associated lesions seen in carcinoma of pancreas. Lymph node metastasis (33%) was commonest extra-pancreatic sign followed by hepatic metastasis (17%), involvement of contiguous organs (17%) and obstructive biliary dilatation (17%). Peripancreatic infiltration, ascites, pleural effusions were less commonly observed whereas Hepatic metastasis was identified in 15 patients (36%) which was commonest in study conducted by E.A. Eelkema *et al.*, [12].

There are many congenital anomalies seen with pancreas like annular pancreas, pancreatic divisum, duplication and ectopic pancreatic tissue.

Many variants about shape, size and orientation are described. Knowledge of these conditions is important for radiologist in interpretation and avoids misdiagnosis.

In this study we found one case of annular pancreas this case contributes to congenital lesion category. E A Free and Barry Gerald [13] also showed annular pancreas as a common congenital lesion in study conducted on infants.

## CONCLUSION

The result of present study show that computed tomography is efficacious in detection and characterizing pancreatic pathologies. Pancreatic disorders were common in males than in females commonest age group affected was between 20-40 years. The commonest pancreatic pathology was acute pancreatitis followed by chronic pancreatitis and pancreatic carcinoma respectively and out of these pathologies acute pancreatitis & pancreatic carcinoma showed statistically significant association with mentioned socio-demographic variables.

## REFERENCES

1. Frederick LH, Helena G, Nancy AH, Richard MG. Pancreas: normal anatomy and examination techniques. In Textbook of gastrointestinal radiology. 3<sup>rd</sup> edition. Saunders Elsevier Ltd 2008;2:1839-54.
2. Williford ME, Foster Jr WL, Halvorsen RA, Thompson WM. Pancreatic pseudocyst: comparative evaluation by sonography and computed tomography. American Journal of Roentgenology. 1983 Jan 1;140(1):53-7.
3. Shuman WP, Carter SJ, Montana MA, Mack LA, Moss AA. Pancreatic insufficiency: role of CT evaluation. Radiology. 1986 Mar;158(3):625-7.
4. Mendez Jr G, Isikoff MB, Hill MC. CT of acute pancreatitis: interim assessment. American Journal of Roentgenology. 1980 Sep 1;135(3):463-9.
5. Hill MC, Barkin J, Isikoff MB, Silverstein W, Kalsner M. Acute pancreatitis: clinical vs. CT findings. American Journal of Roentgenology. 1982 Aug 1;139(2):263-9.
6. Haaga JR, Alfidri RJ, Zelch MG, Meany TF, Boller M, Gonzalez L, Jelden GL. Computed tomography of the pancreas. Radiology. 1976 Sep;120(3):589-95.
7. Luetmer PH, Stephens DH, Fischer AP. Obliteration of periaarterial retropancreatic fat on CT in pancreatitis: an exception to the rule. American Journal of Roentgenology. 1989 Jul 1;153(1):63-4.
8. Kolmannskog F, Schruppf E, Bergan A, Larsen S. Diagnostic value of computer tomography in chronic pancreatitis. Acta Radiologica Diagnosis 1981;22(6):1-5.

9. Wyatt SH, Fishman EK. Spiral CT of the pancreas. *Seminars in Ultrasound, CT and MR.* 1994;15(2):122-32.
10. Aspestrand, F., & Kolmannskog, F. (1992). CT compared to angiography for staging of tumors of the pancreatic head. *Acta Radiologica*, 33(6), 556-560.
11. Freeny PC. Impacted Bile Duct Stone and Chronic Pancreatitis. *American Journal of Roentgenology.* 2001 Apr;176(4):898-.
12. Eelkema EA, Stephens DH, Ward EM, Sheedy 2nd PF. CT features of nonfunctioning islet cell carcinoma. *American journal of roentgenology.* 1984 Nov 1;143(5):943-8.
13. Free EA, GERALD B. Duodenal obstruction in the newborn due to annular pancreas. *American Journal of Roentgenology.* 1968 Jun;103(2):321-5.