



BIOCHEMICAL MARKERS IN ACUTE PANCREATITIS IN THE ERA OF ENDOSCOPIC ULTRASOUND.

Dr. Sadaf Ali*

Senior Resident, Department of Biochemistry, Government Medical College, Srinagar. *Corresponding Author

Dr. Nadeem Rashid

Senior Resident, Department Of Surgery, Government Medical College, Anantnag.

Dr. Sabhiya Majid

Professor, Department of Biochemistry, Government Medical College, Srinagar

ABSTRACT

Acute pancreatitis is a common clinical condition resulting in inflammation of pancreatic tissue usually associated with cholelithiasis and or consumption of excess alcohol. Biliary calculus disease remains frequent pathology in these patients. The main aim of our study was to find usefulness of simple, cost effective biochemical tests in differentiating acute biliary and non-biliary pancreatitis. Detection of biliary aetiology may be useful in treatment by prioritising such patients for earlier cholecystectomy and thereby preventing further pancreatic damage. A total of 200 diagnosed patients of acute pancreatitis were selected for the purpose of this study. Patients were divided into two groups each comprising of 100 acute pancreatitis patients and were grouped on the basis of biliary and non-biliary aetiology. The study was conducted between March 2019 to April 2020. A simple, rapid and accurate prediction of biliary aetiology in acute pancreatitis may be provided by assessment of changes in various biochemical parameters. Clinico-biochemical prediction of biliary cause of acute pancreatitis may provide as a useful alternative in the centres where there is no access to endoscopic ultrasonography and unavailability of any local expertise. This may prove useful so as to avoid serious complications of delayed surgery and help in earlier definitive treatment of biliary pancreatitis thereby preventing morbidity and mortality.

KEYWORDS : Acute pancreatitis, biliary aetiology, cholelithiasis, cholecystectomy, clinico-biochemical.

INTRODUCTION:

Acute pancreatitis is a serious abdominal emergency and is defined as an inflammatory condition in pancreas that often affects pancreas and peri-pancreatic fat but may sometimes affect systemic organs also.^{1,2,5} Gall stone disease is a potential life threatening condition and commonest cause of pancreatitis worldwide with significant mortality and morbidity. In order to prevent repeated episodes of acute cholecystitis it is important to offer definitive management to these patients by performing elective cholecystectomy. The aetio-pathogenesis of acute pancreatitis is not exactly clear. Biochemical tests and radiological findings may be useful in differentiating biliary and non-biliary pancreatitis as well as for prediction of prognosis in these patients. This may be useful for planning and development of early treatment modalities and prevention of secondary complications. Following ERCP for biliary pancreatitis the timing of cholecystectomy, may vary markedly depending on severity of pancreatitis. Abdominal ultrasonography is the gold standard test to diagnose cholelithiasis with sensitivity of almost 100% in uncomplicated situation that decreases to 67-87% in acute pancreatitis.^{3,5} According to literature, Endoscopic Ultrasound reveals biliary etiology more correctly and almost 75% of underlying biliary pancreatitis may be differentiated by EUS.^{1,6,7} However, availability of Endoscopic ultrasonography and local expertise in small set up needs further consideration.

As an alternative to this problem, simple and cost-effective biochemical investigations such as serum bilirubin levels and levels of various enzymes such as alanine transaminase, aspartate transaminase and amylase levels have been proposed to identify underlying biliary pathology.⁸⁻¹⁰ Aim of this study was to investigate the differences in biochemical parameters between biliary and non-biliary acute pancreatitis and its role in detection of biliary etiology in case of acute pancreatitis.

MATERIALS AND METHODS:

Patient selection: Ambulatory patients of acute pancreatitis (both biliary/non biliary pancreatitis) attending the Department of General surgery, SMHS were taken for the purpose of this

study. Patients were divided into two groups according to biliary and non biliary pathology. Each group consisted of 100 patients. The study was conducted between March 2019 to April 2020. Study was conducted after obtaining ethical clearance from the institutional Ethical Committee. Each patient was informed about the purpose of this study and written informed consent was taken from the patients.

Source of data and sampling methods: Ambulatory patients of acute pancreatitis attending the Department of General Surgery SMHS Hospital.

Type of study: Cross sectional, Analytical. Data analysed by using SPSS version 20 and excel sheets were used for compilation of data. Statistical tool used was Mann Whitney-U test.

Inclusion Criteria: Known ambulatory cases of acute pancreatitis (biliary and non-biliary) diagnosed by clinical signs and symptoms and confirmed by USG.

Exclusion Criteria: Biliary ascariasis, alcoholism, liver cirrhosis, viral hepatitis.

Clinical history and case sheets:

Pain (Nature, radiation, duration, aggravating and relieving factors.), dehydration, jaundice, abdominal guarding, Murphy's sign, co-morbid conditions like diabetes mellitus, hypertension, post menopausal onset, parity, abdominal USG findings.

Biochemical tests:

Serum Amylase levels, liver function test, total leucocytes count.

RESULTS:

Table 1: Various aetiologies underlying acute pancreatitis in our study group.

Aetiology	Percentage
Cholelithiasis	40%
Biliary ascariasis	10%
Drug induced	5%
Idiopathic	20%

According to the results shown in Table 1, the most common aetiology of acute pancreatitis in our study population was cholelithiasis followed by biliary ascariasis and the least common was drug induced. However, alcohol intake is a significant cause according to literature, but we have excluded alcoholism in this study.

Table 2: Comparison of Biochemical parameters between the study groups

Biochemical test	Biliary Pancreatitis (Mean ± SD)	Non-biliary Pancreatitis (Mean ± SD)
Total Billirubin	(2.29 ± 0.66)	(1.46 ± 0.36)
Serum Amylase	(31141.3 ± 4635.22)	(19600 ± 4546.39)
Aspartate transaminase	(201.09 ± 10.23)	(112.77 ± 20.41)
Alanine transaminase	(194.5 ± 55.01)	(103.37 ± 27.08)
Total Leucocyte count	(17465.35 ± 3884.75)	(1363.76 ± 2810.17)

Table 3: Comparison using Mann Whitney-U test among the study groups

	Biliary Pancreatitis Mean rank	Non-biliary Pancreatitis Mean rank	Mann Whitney U test	p value
Total Billirubin	83.1	33.4	499.0	<0.001
Serum Amylase	131.1	51.0	495.0	<0.001
Aspartate transaminase	152.0	51.0	0.0	<0.001
Alanine transaminase	141.0	55.9	495.0	<0.001
Leucocytes	131.4	71.6	2084.0	<0.001

According to the results shown in Table 3, there was a statistically significant difference between various biochemical parameters when compared between biliary and non-biliary groups. It was found that patients who have biliary aetiology tend to develop pancreatitis most commonly and may be differentiated by simple biochemical tests at an earlier stage. Earlier intervention in such patients may prove helpful and prevent further pancreatic damage in these patients by earlier timely cholecystectomy.

DISCUSSION:

Gallstone induced pancreatitis represent more than one third of the etiology of acute pancreatitis.¹¹ Diseases of biliary tract are diagnosed by abdominal ultrasound and represents the standard tool with a high sensitivity and specificity around 95%. However, the sensitivity of abdominal ultrasound in the setting of acute pancreatitis decreases due to overlying air-filled bowel loops.¹² At present the best diagnostic tool of choledocholithiasis is endoscopic ultrasound, but the availability is difficult.¹³ Clinico-biochemical score might provide useful as a very good tool in patient selection for EUS diagnosis of biliary acute pancreatitis.¹⁸ A serum ALT of > 150IU/l is predictive of gall stone pancreatitis with a positive predictive value of 95%.¹⁹

In the centres where endoscopic ultrasonography is inaccessible and or local expertise is unavailable, clinico-biochemical prediction of biliary cause of acute pancreatitis may provide a useful alternative in the initial management of such patients.⁵ Timing of cholecystectomy depends on the severity of pancreatitis. With the advances in medicine laparoscopic cholecystectomy is to become the procedure of choice for biliary pancreatitis.²⁰ In order to avoid complications of delayed surgery, there has been a move towards an earlier definitive treatment for biliary pancreatitis.²¹

CONCLUSION:

Cholelithiasis is the most common cause of acute pancreatitis which is a serious abdominal emergency associated with

significant mortality and morbidity.⁵ In order to deliver a definitive therapy for prevention of repeated attacks of acute pancreatitis it is important to detect biliary aetiology.¹⁴ Early identification of the biliary aetiology may be useful to guide an urgent endoscopic sphincterotomy. This has a beneficial impact on the outcome of biliary calculus disease and eventual prevention of pancreatitis.^{15, 16} Differences in the results of various biochemical investigations in acute biliary and non-biliary pancreatitis provides a simple, rapid and accurate prediction of biliary etiology of acute pancreatitis.¹⁷ Therefore, this study concludes that simple biochemical tests may be helpful to differentiate between biliary and non-biliary pancreatitis in centres where facilities like Endoscopic ultrasound and local expertise are not available.

REFERENCES:

- Liu CL, Lo CM, Chan JK, Poon RT, Fan ST (2000). EUS for detection of occult cholelithiasis in patients with idiopathic pancreatitis. *Gastrointest Endosc*; 51(1):28-32.
- Banks PA (2002). Epidemiology, natural history, and predictors of disease outcome in acute and chronic pancreatitis. *Gastrointest Endosc*. 56(6 Suppl):S226-30.
- Hessler PC, Hill DS, Deforje FM, Rocc FM (1981). High accuracy sonographic recognition of gallstones. *AJR Am J Roentgenol*. 136(3):517-20.
- Alexakis N, Lombard M, Raraty M, Ghaneh P, Smart HL, Gilmore I, et al. (2007). When is pancreatitis considered to be of biliary origin and what are the implications for management? *Pancreatology*. 7(2-3):131-41.
- Trikudanathan G, Navneethan U, Vege SS (2012). Current controversies in fluid resuscitation in acute pancreatitis: a systematic review. *Pancreas*. 41(6):827-34.
- Frossard JL, Sosa-Valencia L, Amoyal G, Marty O, Hadengue A, Amoyal P (2000). Usefulness of endoscopic ultrasonography in patients with "idiopathic" acute pancreatitis. *Am J Med*. 109(3):196-200.
- Norton SA, Alderson D (2000). Endoscopic ultrasonography in the evaluation of idiopathic acute pancreatitis. *Br J Surg*. 87(12):1650-5.
- Ammori BJ, Boreham B, Lewis P, Roberts SA (2003). The biochemical detection of biliary etiology of acute pancreatitis on admission: a revisit in the modern era of biliary imaging. *Pancreas*. 26(2):e32-5.
- Tenner S, Dubner H, Steinberg W (1994). Predicting gallstone pancreatitis with laboratory parameters: a meta-analysis. *Am J Gastroenterol*. 89(10):1863-6.
- Davidson BR, Neoptolemos JP, Leese T, Carr-Locke DL (1988). Biochemical prediction of gallstones in acute pancreatitis: a prospective study of three systems. *Br J Surg*. 75(3):213-5.
- Gullo L, Migliori M, Pezzilli R, Olah A, Farkas G, Levy P et al. (2002). An update on recurrent acute pancreatitis: data from five European countries. *Am J Gastroenterol*. 97:1959-1962.
- Ammori BJ, Boreham B, Lewis P, Roberts SA (2003). The biochemical detection of biliary etiology of acute pancreatitis on admission: a revisit in the modern era of biliary imaging. *Pancreas*. 26:e3235.
- Buscarini E, Tansini P, Vallisa D, Zambelli A, Buscarini L (2003). EUS for suspected choledocholithiasis: do benefits outweigh costs? A prospective, controlled study. *Gastrointest Endosc*. 57:510518
- C.L. Liu et al. (2005). Clinico-biochemical prediction of biliary cause of acute pancreatitis in the era of endoscopic ultrasonography. *Aliment Pharmacol Ther*. 22: 423-431.
- Neoptolemos JP, Carr-Locke DL, London NJ, Bailey IA, James D, Fossard DP (1988). Controlled trial of urgent endoscopic retrograde cholangio pancreatography and endoscopic sphincterotomy versus conservative treatment for acute pancreatitis due to gallstones. *Lancet* 2: 979-83.
- Fan ST, Lai EC, Mok FP, Lo CM, Zheng SS, Wong J (1993). Early treatment of acute biliary pancreatitis by endoscopic papillotomy. *N Engl J Med* 328: 228-32.
- Tanka Prasad Bohara (2013). Role of Biochemical Investigation in Prediction of Biliary Etiology in Acute Pancreatitis. *J Nepal Med Assoc*; 52(189):229-32.
- Zamescu NO et al. Clinico-biochemical factors to early predict biliary etiology of acute pancreatitis: age, female gender, and ALT. *University Emergency Hospital Bucharest, Romania*
- WR Matull, S P Pereira, J W O'Donohue (2006). Biochemical markers of acute pancreatitis. *J Clin Pathol*. 59:340-344.
- Neha Jindal et al. Effect of cholelithiasis and cholecystectomy on serum lipids and blood glucose parameters. *Archives of International Surgery*.
- Ankush Sarwal MS, Pulkit Maru M.D, Anant Pore, Piyush Shankar Tripathi, Amardeepkumar (2018). *ARC Journal of Surgery*. Biliary Pancreatitis: Current Practices and Guidelines. Volume 4, Issue 4, 2018.