ORIGINAL ARTICLE

EXTRAPANCREATIC INFECTIONS IN ACUTE PANCREATITIS AND ITS INFLUENCE ON DISEASE OUTCOME

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ABSTRACT

Introduction: Limited data is available on prevalence of extrapancreatic infection, its influence on outcome of pancreatitis.

Objectives: To assess the prevalence of extra-pancreatic infections in acute pancreatitis, identify risk factors for development of such infections and influence of extrapancreatic infections on outcome of pancreatitis.

Methodology: Patients of acute pancreatitis admitted from June 2013 to July 2015 were recruited in the study. The patients who developed extra-pancreatic infection formed the study group while patients who didn't develop infections were included in the control group. Both groups were followed and their final outcome was compared.

Results: A total of 350 patients comprising of 158 cases and 192 controls were studied. Prevalence of extra pancreatic infections was found in 41.5% with Urinary tract infections (UTI)(14.4 followed by Biliary (10.0%), pulmonary (8.4%), Pulmonary and UTI (3.7%),Injection site infections (2.1%). Predisposing factors for development of extra pancreatic infections and subsequent outcome of acute pancreatitis was found to be influenced by duration of hospital stay ($p<0.001$), etiology of acute pancreatitis and comorbidities especially Diabeties mellitus ($p<0.001$).

Conclusions: Early detection and proper treatment of infections will definitely improve outcome of acute pancreatitis with infections.

Keywords: Acute pancreatitis, Extrapancreatic infections

INTRODUCTION

Sepsis as a complication is an important cause of morbidity and mortality in acute pancreatitis.[1-3] Occurrence of infection characterizes the more severe forms of the disease, especially when it is associated with secondary organ failure.[4] There mechanisms by which bacteria may enter pancreatic and peripancreatic necrosis are the haematogenous route via the circulation.[5,6], transmural migration through the colonic bowel wall either to the pancreas (translocation), via ascites to the pancreas, or via the lymphatics to the circulation; via the biliary duct system; from the duodenum via the main pancreatic duct.[7-10] Various extrapancreatic infections that are seen associated with acute pancreatitis are, Respiratory tract, Genitourinary tract, Peritoneal fluid Infections , Biliary tract like acute cholangitis, skin, and Intra venous site infections.[10,11] Patients with severe pancreatitis often require prolonged hospitalization and multiple interventions. They often have extrapancreatic infections which may also influence the outcome.[12] We conducted this study to evaluate the prevalence and characteristics of extrapancreatic infections in patients with acute pancreatitis and to determine their effect on patient outcome.

METHODOLOGY

The study was conducted in department of Gastroentrology, Sheri Kashmir Institute of Medical Sciences (SKIMS) Srinagar, Kashmir. A total of 350 Patients of acute pancreatitis who were admitted in the hospital from August 2013 to May 2015 were enrolled in the study. 158 patients who developed extrapancreatic infection constituted the case group while 192 patients who didn't develop any infection were placed in the control group.Patients who either presented with acute attack of chronic pancreatitis or

developed pancreatic infection or had acute recurrent pancreatitis were excluded from the study. These patients were followed upto final outcome. The study was approved by the ethical committee of Sheri Kashmir institute of medical science.Patients were diagnosed acute pancreatitis if they present with two of the following three features: Typical Pancreatic Type of Pain; i.e. Persistent epigastric pain radiating to back which may be associated with nausea and vomiting. Serum amylase/Lipase > 3 times of upper limit (normal value 30 to 110 u/l).Imaging evidence of pancreatitis; USG features of acute pancreatitis-Bulky pancreas /Peripancreatic fat stranding with or without collection. Typical CT findings include focal or diffuse parenchymal enlargement, changes in density because of oedema, indistinct pancreatic margins owing to inflammation surrounding retroperitoneal fat stranding liquefactive necrosis of pancreatic parenchyma, lack of parenchymal enhancement, presence of gas is helpful, FNA helpful, little or no necrotic tissues (thus distinguishing it from infected necrosis), haemorrhage, high-attenuation fluid in the retroperitoneum or peripancreatic tissues. Patients in both groups were followed till final outcome. Detailed physical examination and investigation according to a well defined protocol which included General physical examination and relevant systemic examination, Base line investigations like CBC, Liver function test(LFT),Kidney function test (KFT) , Serum Amylase, Serum calcium, Lipid profile, CRP, Imaging – Chest x ray USG Abdomen and CECT Abdomen as needed. Those who developed fever during the first week were regarded as having SIRS unless they have features suggestive of infection. Those who persisted with fever for more than a week or developed fever after a week were regarded as having infecion and were screened for the focus of infection according to a well defined protocol. Contrast enhanced CT scan (CECT) Abdomen and MRCP as per need.

Statistical software SPSS (version 20.0) and Microsoft Excel were used to carry out the statistical analysis of data. Data was analysed by means of descriptive statistics viz, means, standard deviations and percentages and presented by means of Bar and Pie diagrams. For parametric data, Student's independent t-test was employed. Chi-square test or Fisher's exact test, whichever appropriate, was used for non-parametric data. A P-value of less than 0.05 was considered statistically significant.

RESULTS

This study was conducted in the Department of Gastroenterology Sheri Kashmir Instititute of Medical Sciences Srinagar Kashmir, from August 2013 to May 2015. A total of 158 patients of acute pancreatitis were admitted, patients developing pancreatic infection were excluded from the study, consisting of 158 cases and 192 controls which were followed till their final outcome.

The mean age was 49.9 years in the case group and 46.6 years in the control group. There was no significant difference in number of cases as per gender, with overall female preponderance in both cases and controls. Gall stone was the commonest etiology (67.7%) followed by Ascariasis (15.1%), Alcohol (1.3%), Hypercalcemia (1.9%), Hypertriglyceridemia (1.3%), while in 30 (19%) cases Etiology could not be ascertained. The average Hospital stay was 12.01 days in cases and 4.97 days in controls .There was prolonged hospital stay in patients with extra pancreatic infections in comparable disease severity groups ($p<0.005$) (Table 1).

Table 3: Baseline Characteristics and etiology

Variables	Cases (%)	Controls (%)	p Value
Total Patients	158	192	
Age in years*	49.9±16.59	46.6±16.54	>0.05
Males	55 (34.8)	58 (30.2)	0.346
Females	103 (65.2)	134 (69.8)	
Duration of hospitalization*	12.01±5.96	4.97±1.61	**<0.001**
Etiology			
Gall Stone Induced	107 (67.7)	51 (26.6)	**<0.003**
Worm Induced	29(15.1)	14 (7.3)	
Hypercalcaemia	3(1.9)	2 (1)	
Hypertriglyceridemia	2 (1.3)	0 (0)	
Unknown Etiology	30 (19.0)	109 (56.8)	
Alcohol Use	2 (1.3)	1 (0.5)	

* Values are in Mean ±SD

Table 2: Comparison of Co morbidities between cases and controls

Comorbidity	Cases (%) (n=158)	Controls (%) (n=192)	p-Value
Hypertension	71 (44.9)	68 (35.4)	0.071
Diabetes	29 (18.4)	12 (6.3)	**<0.001**
Hypothyroid	2 (1.3)	6 (3.1)	0.247
COPD	7 (4.4)	4 (2.1)	0.345
Obesity	3 (1.9)	1 (0.5)	0.242
CKD	0	1 (0.5)	0.549
CAD	23 (14.6)	18 (9.4)	0.134

Table 3: Extrapancreatic infections

Extrapancreatic infection	No. (%)
Treated empirically due to persistent SIRS	11 (2.9)
Pulmonary	32 (8.4)
Injection site infections	8 (2.1)
Bilary/Liver	38 (10.0)
UTI	55 (14.4)
Pulmonary+ UTI	14 (3.7)
Overall	**158 (41.5)**

Among comorbidities Diabetes was significantly associated with the development of extrapancreatic infections ($p<0.001$)(Table 2).

Extra pancreatic infections was found in 41.5 %, most commonly urinary tract infections 14.4 % followed by liver and biliary infections 10 %, pulmonary 8.4 %,both pulmonary and UTI in 3.7%, injection site infections 2.1 % and 2.9 % of patients were treated empirically in view of persistent SIRS (Table 3).

DISCUSSION

Extra-pancreatic infectious complication (EIC) in patients with Acute Pancreatitis has been shown to influence morbidity and mortality.[13] We enrolled 350 in our study with 67.71% females and 32.28% males having a female to male ratio of 2.09, while studies conducted by Bessel ink et al, Garg et al., and Delinger et al [4,14,15] have male predominance. The female predominance in our study may be related to the etiology of pancreatitis. Gall stones and worm induced pancreatitis accounting for 86%, Gall stones and Ascariasis are found more in female as compared to males.Mean age of cases was 49.9 years and that of controls was 46.6 years. Hypertension was the commonest co morbidity in all patients however it had no impact on disease outcome. Diabetes was the second commonest co-morbidity seen in 29 (18.4%) of cases compared to 12 (6.3 %) controls and contributed to occurrence of extra pancreatic infections.

Extrapancreatic infection affects the course of pancreatitis and influences the outcome of disease. It increases the mobidity which is reflected by prolonged hospital stay.Mean hospital stay in case-group was 12.01 days with range of 4 to 37 days against the mean hospital stay of 4.97 days with range of 3 to 13 days in control group. This finding is in accordance with the national and international studies.[16,17] Extra pancreatic infection was seen in 41.5 % of patients ,with urinary tract infections UTI being commonest 14.4 % followed by liver and biliary tract infections 10 %, pulmonary 8.4 %,both pulmonary and UTI in 3.7 % ,Injection site infections 2.1 % and 2.9% patients treated empirically with antibiotics. Urine culture was positive only in 5 (3.16%) patients with E.coli grown in 3 (1.89%) cases sensitive to Amikacin, Imepenam and Enterococcus Feacalis in 2 (1.26%) sensitive to Imepenam. Blood culture was positive only in 2 patients with growth of E.coli sensitive to Imepenam, Linezolid, resistant to Piperacillin Tazobactum culture positivity was low as majority of patients had taken antibiotics prior to septic screen. This is comparable with various other studies like, Brown LA et al [13]. In 2014 conducted studies in 1741 patients with extra pancreatic infectious complications and found respiratory infection in 9.2% cases and bacteraemia in 8.4%. Willdison et al[18], in 1993 showed a higher incidence of bacteraemia in patients with pancreatic infections. The source of bacteraemia was respiratory in 17% cases, genitourinary in 17%, biliary in 3%, skin in 3% and the intravenous site in 3% .Acute cholangitis occurred in 6 patients, intravenous site infection in 5 patients, and urine and peritoneal fluid infection occurred in 3 patients each. The most common organisms isolated were Escherichia coli in 25% of the cultures and Pseudomonas aeruginosa in 23%of the cultures.[19]

CONCLUSION

Extrapancreatic Infection influences the outcome of pancreatitis. It increases the morbidity and mortality. Early Detection and Proper treatment of infection by appropriate antibiotics depending on culture sensitivity, site of infection and antibiogram will definitely reduce the influence of infection on the outcome of disease. Diabetic patients should be monitored for the development of infection especially.Patients should be discharged as soon as possible.

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