STUDY OF CELLULITIS IN CIRRHOSIS IN A TERTIARY CARE CENTER

Gastroenterology

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ABSTRACT

Background and Aim: Cirrhosis of the liver predisposes patients to serious bacterial infections including cellulitis. The aim of the study was to determine the clinical and bacteriological profile of cellulitis in patients with liver cirrhosis and also to correlate with severity of liver disease by using parameters such as MELD and CHILD score.

Material and methods: In this prospective study, consecutive cirrhotic patients hospitalized between October 2018 and October 2019 were enrolled. Data retrieved included demographics, aetiology, co-morbidity, cirrhosis-related complications, site of cellulitis, baseline investigations, and wound and blood culture.

Result: 470 cirrhosis patients of whom 52 had cellulitis, mean age 55.8 ± 11.4 years, men 82.60%, median MELD [model of end-stage liver disease] 18.8 ± 10.4 . Non-alcoholic steatohepatitis and alcohol were each the cause of cirrhosis in 80% of cases. 16 patients (30.8%) had diabetes mellitus, majority of the patients were Child C (34 out of 210 Child C cirrhotic), followed by Child B (17 out of 222 Child B cirrhotic patients). Cultures were positive in 28 cases (53.8%; 8 – blood, 28 – wound, 4 – both blood and skin. The majority of the cultures showed monomicrobial growth (20; 70%). *Escherichia coli* was the commonest isolate (16/28), followed by *Klebsiella* (3). 12/28 isolates had multidrug resistant organisms.

Conclusions: Prevalence of cellulitis was 11.0% in hospitalized cirrhotics. Culture positivity was 53.8%. *Escherichia coli* and *Klebsiella* were the most common isolates and three sevenths of isolates were multidrug resistant. Risk of cellulitis increased with severity of cirrhosis.

KEYWORDS

Alcoholism, Chronic Liver Disease, Cirrhosis, Infection.

INTRODUCTION

Bacterial infections are diagnosed in 25% to 47% of hospitalized patients with cirrhosis [1-4] and represent the most important precipitating event for acute decompensation [5]. Infections are increasingly recognized as a major trigger of systemic inflammation and organ failure in advanced cirrhosis leading to four-fold increased mortality [6]. Despite recent advances in understanding the underlying pathogenic mechanisms of bacterial infections in cirrhosis, organ failure and septic shock is still associated with a short term mortality of patients exceeding 75% [5, 10].

THE AIM OF THE STUDY

The aim of the study was to determine the clinical and bacteriological profile of cellulitis in patients with liver cirrhosis and also to correlate with severity of liver disease by using parameters such as MELD and CHILD score.

MATERIAL AND METHODS

This study was conducted at department of Medical Gastroenterology at Stanley Medical College, Chennai. It was an Observational Prospective study conducted between 1st October 2018 to 30th October 2019, 52 consecutive patients with Cellulitis were included. Vital data were collected regarding demographics, co morbidities, etiology, stage, MELD (Model of End Stage Liver Disease) and complications of Cirrhosis. Baseline investigations with Complete blood count, liver function test, renal function test, Blood sugar, and fasting Lipid profile were done, culture and sensitivity were obtained from blood and site of cellulitis as per CDC protocol before instituting antibiotics empirically at time of admission, change of antibiotics were decided as per clinical status and resistance pattern shown by reports.

Informed consent was taken from all the patients and the protocol was approved by the Institutional Ethics Committee

RESULTS

Baseline characteristics

There were four hundred and seventy (470) patients with Cirrhosis admitted during study period, among which 52 (11%) had cellulitis,

and they constituted the study cohort. Mean age was 55.8 ± 11.4 years, and majority were males (43 (82.6%), 9 (17.4%) were females. Etiology of Alcohol 30 (57.6%), NASH 12 (23.0%), HepB 6 (10.7%), HCV 1 (1.9%) Wilson disease 1 (1.9%), 5 patients had both ethanol and hepatitis B related cirrhosis and remaining patient were cryptogenic cirrhosis.

16 patients (30.8%) had type 2 diabetes mellitus. There were only 8 past smokers. Apart from cellulitis, other complications during admission included refractory ascites and renal dysfunction in 24 patients (46.1%), spontaneous bacterial peritonitis in 12 patients (23.1%), hepatic encephalopathy in 12 cases (23.1%) and gastrointestinal bleeding in 7 cases (13.46 cases) respectively.

Ten (19.2%) of the 52 patients had cellulitis in the past.

12 patients (23.1%) had past history of SBP but only one patient on antibiotic prophylaxis.

The baseline haematological & biochemical parameters at recruitment are shown in Table 1. MELD score less than 10 in 2 patients with cellulitis out of 62 cirrhotic with MELD less than 10 (3.9%). 293 cirrhotic patient with MELD 10-20, 26 (8.9%) have cellulitis, 115 cirrhotic patient with MELD > 20, 24 (20.9%) presented with cellulitis, majority of the patients were Child C 34 (20.5%), followed by Child B (17 (7.6%) cirrhotic patients.

Table 1-base line hematological and biochemical parameter.

SI NO	Parameter	Mean	Range
1	Corrected Body mass index (kg/m ²)	22.3	18.4-32.5
2	Hemoglobin (gm%)	8.5	7.5-14.3
3	Platelet count (cells/m ³)	58000	27000-280000
4	Serum bilirubin (mg/dl)	4.4	1.7-20.2
5	Serum albumin	2.7	1.9-4.1
6	INR	1.8	1.3-3.2
7	Serum creatinine	2.5	0.7-5.2

Skin involvement

Most common site of cellulitis was lower limb, 38 cases (73.1%), out of it 32 had unilateral cellulitis and 6 cases have bilateral cellulitis.

9 cases (17.3%) have upper limb cellulitis, 3 patients (5.7%) had scrotal cellulitis and 2 patients (3.8%) had cellulitis over trunk. 24 (46.%) patients were having local edema, erythematous skin changes with raised local temperature classified as Grade-I, 25 (48.1%) patients were having additional features of systemic symptoms as fever, tachycardia and tachypnoea, labeled as Grade-II, 3 (5.7%) had unstable hemodynamic status Grade-III. All the patients with lower limb cellulitis underwent lower limb venous doppler study to look for chronic venous insufficiency and arterial doppler for arterial atherosclerosis with decreased distal bloodflow.

Culture and sensitivity

Blood culture shown growth in 8 (8.5%) and infection site swab culture were positive in 24 (46.1%) of patients and 4 patients both skin and blood culture were positive. (total culture positive cases were 28 (53.8%). Most of the culture showed mono microbial growth 71% (20 cases) most common organism isolated was *E. coli* 16 (57%) followed by *Klebsiella* 3 (10.7%), *Pseudomonas* 2 (7.1%) *Streptococcus* 2 (7.1%), Coagulase negative *Staphylococcus* 1 (3.5%), 12 patients have multidrug resistant organism. All patients in Grade-I/II recovered but mean duration of treatment in Grade-I was 7 ± 2.8 days but in Grade-II it was 16 ± 4.1 days. But out of 3 patients with Grade-III cellulitis 2 succumbed to illness.

DISCUSSION

Patients with cirrhosis have an increased risk of developing bacterial infection, sepsis, and death.¹¹⁻¹³ Spontaneous bacterial peritonitis (SBP) and urinary tract infections are the most frequent infections followed by pneumonia, cellulitis and bacteremia. Clinical risk factors include poor liver function, variceal bleeding, low protein ascites, prior episode of SBP, and hospitalization.^{11,12} In patients with advanced cirrhosis, infection induces a systemic inflammatory response characterized by high circulating levels of pro inflammatory cytokines. In present study we observed, risk of cellulitis increases with the severity of liver disease, 34 out of 210 Child C cirrhotic patient had cellulitis as compared with 17 out of 222 Child B cirrhotic patients had cellulitis.

Third-generation cephalosporins continue to be first line drug for treatment of many of the infections acquired in the community.^{14,15} However we empirically started on Oral Amoxy-Clavulanic acid in patients with CTP-A with grade-I cellulitis, but 3rd generation cephalosporin in patients with CTP-A with grade-II or CTP-B/C with grade-I/II cellulitis and Piperacillin + Tazobactam in patients with Grade-III cellulitis irrespective of CTP, antibiotics change policy were adopted if patients were not responding to empirical treatment for 72 hours or blood or swab culture was showing resistance pattern. All patients in Grade-I/II recovered but mean duration of treatment in Grade-I was 7 ± 2.8 days but in Grade-II it was 16 ± 4.1 days. But 2 patients with Grade-III cellulitis succumbed to illness.

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