

Short Communication

Association of poor oral hygiene with spontaneous bacterial peritonitis in cirrhotic patients with ascites

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Received – 27 August 2020

Initial Review – 10 September 2020

Accepted – 26 September 2020

ABSTRACT

Background: Spontaneous bacterial peritonitis (SBP) is a frequent complication of cirrhosis resulting from factors like bacteraemia and defective ascitic fluid bactericidal activity. Also, bacteraemia is more common in patients with poor oral hygiene. **Objective:** To assess the association of SBP and poor oral hygiene in cirrhotic patients with ascites. **Methods:** A cross-sectional study was conducted among Forty-three cirrhotic patients with ascites admitted in Gastroenterology department of a tertiary care centre in central Kerala between November 2017 and July 2018. Patients were divided into 2 groups (good and poor oral Hygiene) using the simplified Oral Hygiene Index (OHI-S). Paracentesis was done and a neutrophil count of >250/cm² was considered as diagnostic of SBP. **Results:** Of the 43 patients studied, 17 patients had poor oral hygiene and 26 patients had good oral hygiene. The association of SBP with poor oral hygiene was observed in 12 (70.6%) patients, while 2 patients with good oral hygiene had SBP ($p < 0.0001$). Poor oral hygiene was more common in patients with higher MELD (Model for end stage liver disease) scores. However even in patients with higher MELD scores (>10), SBP was more common in patients with poor oral hygiene (81.8 vs 16.7 %). **Conclusion:** SBP was more common in cirrhotic patients with ascites and poor oral hygiene. Further prospective studies are needed to determine whether improving oral hygiene can reduce the incidence of SBP.

Key words: cirrhosis, oral hygiene index, poor oral hygiene, spontaneous bacterial peritonitis

Bacterial infections are very common in patients with cirrhosis, it plays a significant role in the onset of acute to chronic liver failure [1]. Previous studies have shown spontaneous bacterial peritonitis (SBP), urinary tract infection (UTI) and pneumonia to be the common infections associated with cirrhosis [2]. The higher incidence of bacterial infections in cirrhotic patients is thought to be due to two pathophysiological conditions such as dysregulated intestinal bacterial translocation and cirrhosis associated immune dysfunction (CAID) which encompasses both local and systemic immune system alterations occurring in cirrhosis [3].

Periodontitis causes increased incidence of bacteraemia. Poor oral hygiene leads to deeper gingival crevice and periodontal pockets, which act as a reservoir for a large number of microorganisms and inflammation results in translocation of bacteria into adjacent gingival microcirculation [4]. Although, there are studies showing the importance of poor oral hygiene in the causation of infective endocarditis [5], however, no published studies have looked at the correlation of poor oral hygiene in cirrhotic patients with SBP. Hence, the present study was conducted to assess whether poor oral hygiene was more prevalent in patients with cirrhotic ascites and SBP.

MATERIAL AND METHODS

A cross-sectional study was conducted among 43 patients with cirrhosis and new onset ascites admitted in the Gastroenterology department of a tertiary care centre in central Kerala between November 2017 and July 2018. A detailed history including aetiology, duration of cirrhosis, risk factors, duration of ascites and symptoms at presentation were recorded in a proforma specific to the study. Oral hygiene was assessed using simplified Oral Hygiene Index (OHI-S) by the same examiner. A score of more than or equal to 3 was considered as poor oral hygiene. Diagnostic paracentesis was done under aseptic precautions. Neutrophil count of $>250/\text{cm}^2$ was considered as diagnostic of SBP. Patients were divided into 2 groups - good oral hygiene (Good OH) and poor oral Hygiene (poor OH), using the OHI – S index and the prevalence of SBP in the two groups calculated. The collected data was analysed using the SPSS software version 15.0 and p value was calculated using the chi square test.

RESULTS

Among the 43 patients studied, 17 patients had poor oral hygiene and 26 patients had good oral hygiene. The aetiologies of cirrhosis in groups with poor and good oral hygiene were alcohol (64.7% vs 65.3%), Non-alcoholic steatohepatitis (NASH - 35.3% vs 30.7 %) and hepatitis B (0% vs 3.8%) ($p = 0.35$). The average duration of ascites was 19 months in the good OH group and 16 months in the poor OH group. A total of 14 (32.5%) patients had SBP in the study cohort. In the group of patients with poor oral hygiene, 12 (70.6%) patients had SBP, while 2 (7.7 %) patients in the good oral hygiene group had SBP ($p < 0.0001$) (Figure 1).

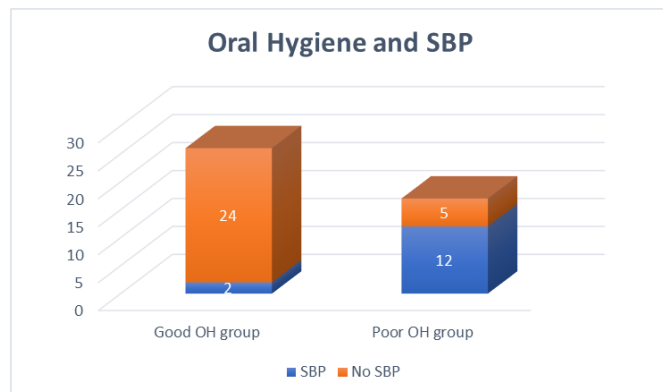


Figure 1: Bar diagram showing distribution of patients based on SBP and oral hygiene

The prevalence of poor oral hygiene in patients with MELD (Model for end stage liver disease) scores of <10 , 10-19 and ≥ 20 was 30%, 52.4% and 50% respectively. In the good oral hygiene group, 14, 11 and 1 patients had MELD scores of <10 , 10 -19 and ≥ 20 respectively. Meanwhile in the poor oral hygiene group, 6, 10 and 1 patients had MELD scores of <10 , 10 -19 and ≥ 20 respectively. The prevalence of SBP was more in the poor oral hygiene group compared to those with good oral hygiene in the group of patients with MELD score ≥ 10 . SBP was present in 3 patients (50%) in the poor OH group vs none (0%) in the good OH group, 8 patients (80%) in the poor OH group vs 2 patients (18%) in the good OH group, 1 patient (100%) in the poor OH group vs none (0%) in the good OH group among patients with MELD scores of <10 , 10 -19 and ≥ 20 respectively ($p < 0.001$) (Figure 2).

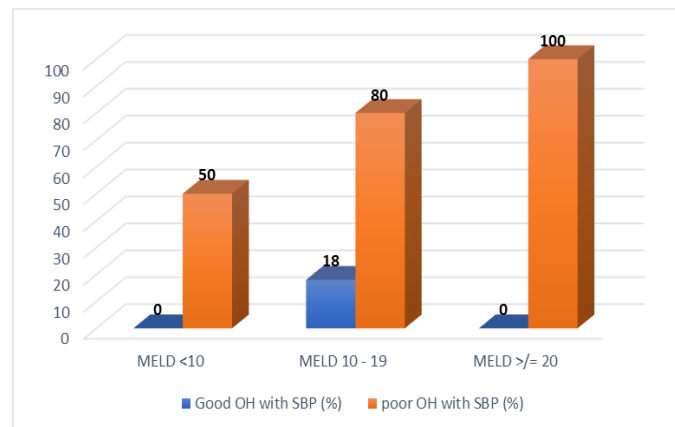


Figure 2: Bar diagram showing the prevalence of SBP (%) in patients with good and poor oral hygiene based on MELD scores

DISCUSSION

Spontaneous bacterial peritonitis (SBP) is a common complication of cirrhosis with a prevalence of 1.5–3.5% in outpatients and ~10% in hospitalised patients [6]. Further, it has a poor prognosis and impairs quality of life recommending a referral to liver transplantation team at the earliest [7]. Bacterial translocation is considered to be the most important pathophysiological mechanism leading to development of SBP. Till date, intestinal bacterial overgrowth, the structural and functional alterations of the intestinal mucosal barrier and local immune response deficiencies are considered to be the main factors leading to bacterial translocation [8].

Studies involving infective endocarditis have shown that bacteraemia is more common in patients with periodontitis [4]. However, to our knowledge there are no studies as yet looking at the correlation of poor oral hygiene and SBP. In our study, poor oral hygiene was seen in one third of patients. Association of poor oral hygiene and SPB is multifactorial. Decreased blood flow of the mucogingival junction, poor immunity, decreased salivation due to diuresis and increased levels of serum alkaline phosphatase are thought to be the predisposing factors [9]. This can also explain the increasing prevalence of poor oral hygiene in patients with higher MELD scores.

Prevalence of SBP was significantly higher in patients with poor oral hygiene. To avoid the possibility of poor liver status being the confounding factor a subgroup analysis was done dividing patients into three groups on the basis of MELD scores (< 10, 10 – 19 and \geq 20). It was found that in all the three groups, patients with poor oral hygiene group had higher prevalence of SBP suggesting that poor oral hygiene could be an additional risk factor for SBP. However the study is limited by small sample size included in the study. It was also not analysed whether interventions to improve oral hygiene would result in decrease in the occurrence of SBP. Authors believe that this study would pave way for future studies and help in finding the missing link in the occurrence of SBP.

CONCLUSION

Spontaneous bacterial peritonitis is more common in patients with cirrhosis and ascites along with poor oral hygiene. Poor oral hygiene was more common in patients with higher MELD scores. Even when grouped according to increasing MELD scores, SBP was more common in patients with poor oral hygiene. Further studies are needed to assess the correlation and association of poor oral hygiene and SBP.

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How to cite this article: Jose M, Kunnathuparambil SG, Panakkal RP, John AKA. Association of poor oral hygiene with spontaneous bacterial peritonitis in cirrhotic patients with ascites. *J Orofac Res.* 2020;9(4):68-70.

Funding: None; Conflict of Interest: None Stated.