

Periodontitis in Patients with Cirrhosis at Chandka Medical College Hospital and Bibi Aseefa Dental College Hospital Larkana

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ABSTRACT

Background: In the patients of cirrhosis oral health is generally poor and may lead to oral infections. Periodontal disease is an infection of structures in the mouth that surround the teeth, which is linked with several systemic diseases, including cirrhosis. **Objective:** To determine the frequency of Periodontitis in patients with cirrhosis at Chandka medical college hospital and Bibi Asifa dental college hospital Larkana. **Study Design:** cross-sectional study. **Settings:** Department of Medicine and Department of Periodontology at Chandka Medical College Hospital and Bibi Asifa dental college Hospital Larkana Pakistan. **Duration:** Six months from 01-08-2019 to 31-01-2020. **Methodology:** All the diagnosed patients of liver cirrhosis based on either elastography and/or clinical, biochemical, and ultrasonic findings having, age >18 years and either of gender were included in the study. Severity of liver cirrhosis was assessed by Child-Pugh classification taking help of gastroenterologists. Periodontitis was defined as progressive chronic inflammatory destruction of connective tissue of tooth and surrounding structures eventually leads to tooth loss. Data was collected via study proforma and analyzed by using SPSS software version 20.0. **Results:** Total 100 cirrhosis patients were studied; patients mean age was 46.10±9.01 years and average of disease duration was 2.10±1.7 years. Males were most common 62.0%. Plaque was seen almost in all cases 98.0%. Most of the cases had moderate and severe periodontitis 36.0% and 35.0% respectively 26.0% had mild periodontitis. Moderate and severe periodontitis were significantly high in patients having age more than 40 years, female gender and having child Pugh class II and III, (p=0.001). However, there was no significant association between severity of periodontitis and duration of cirrhosis. **Conclusion:** In the observation of this study the periodontitis rate was higher in patients of cirrhosis and it was significantly linked to child Pugh class II and III. Oral health status should be assessed and maintained among patients of cirrhosis.

Keywords: Liver cirrhosis, Periodontitis, Severity.

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INTRODUCTION

Periodontitis is a multifactorial etiology involving inflammatory disease, which affects the underlying teeth tissues and is marked by deepening periodontal pockets, gradual loss of alveolar bone and attachment of connective tissue across the teeth, progressing gradually towards tooth loss. Periodontitis, if unresolved, can lead to irritation, pain, poor mastication, and loss of the tooth.^{1,2}

Periodontal disorder is a widespread chronic condition, with an approximate incidence from 10% to 60% in adults, is referred to as periodontitis (irreversible) or gingivitis (reversible). Gingivitis can evolve into periodontitis, with inflammatory response of underlying soft tissues of gingiva or tooth, over time. It may be diagnosed through clinical assessment using periodontal probe to assess the clinical attachment loss and pocket depth in conjunction with radiographic assessment.² Periodontal disease, even with slight periodontal tissue chronic inflammation, is correlated to malnutrition, systemic conditions including cardiovascular disorder, cirrhosis and type II DM, chronic renal disease, and also preterm low birth weight in infants.¹⁻⁵ Cirrhosis, a final stage of hepatic disorder, is among the most prevalent factors of mortality and morbidity globally. Cirrhosis, following many years or even decades of

inflammatory response and fibrosis, leads to hepatic nodular change. It clinically has two stages, compensated and decompensated (oesophageal varices, malnutrition symptoms oedema, ascites, jaundice and coagulation abnormalities).⁶

Across the US alone, the disorder has an annual mortality rate of around 13.2% and it is the twelfth major factor of death. Cirrhosis may be caused by different etiologies including viral hepatitis (hepatitis B and hepatitis C), alcoholic related liver disease (ARLD) and nonalcoholic steato-hepatitis/nonalcoholic fatty liver disease (NASH/NAFLD) being among the most common. Viral hepatitis is presently the major cause of cirrhosis, globally.⁷

As a result of hepatic failure, hepatic cirrhosis cases have raised serum cytokine concentrations, which are likely to be involved with destructive phase of periodontal disorder by enhancing metalloproteinase and collagenase activity. So, with the consideration of the oral cavity, changes in immune system and elevated levels of cytokines can be involved in significant periodontal breakdown. Oral health has been found to be usually poor among patients having cirrhosis and chronic periodontal disease (gingival bleeding, gingivitis) is a common finding. The risk factors and incidence for periodontitis among cirrhotic patients are investigated individually.^{1,2,4,8}

A cross sectional study conducted in Denmark over 145 patients of cirrhosis found 46% cases of severe periodontitis, 39% cases of moderate periodontitis, and just 15% cases of either no periodontitis or mild periodontitis. Periodontitis has been found to be extremely common among cirrhosis patients in all etiologies.¹

In some studies, reported greater frequency of severe gingivitis in addition to a higher incidence of oral lesions among hepatic disorder patients, indicating the advancement of hepatic dysfunction.^{3,5} On other hand it is stated that, in cirrhosis, the estimated incidence of periodontal disorder is controversial.²

At, Chandka Medical College Hospital Larkana, has a huge population of hepatic cirrhosis patients because of traditional causes and mostly because of viral Hepatitis (B and C). A hepatic cirrhosis study will therefore be of critical interest and usefulness in this region. Bacterial infections are widespread and raise mortality and morbidity, despite modern medical treatments that have significantly enhanced the capacity to treat and prevent complications of cirrhosis. Infection in oral cavity mostly leads to localized disease; however systemic disease and bacteremia can also emerge from oral infections. It would be of great significance to validate oral condition as an independent risk factor for adverse cirrhotic outcomes, since this condition is both treatable and preventable. However, in our system, dental disorders and complaints are being overlooked, which renders the strategies of successful management controversial. This study thus aimed to assess the frequency of periodontitis in cirrhosis at Chandka medical college hospital and Bibi Asifa dental college hospital larkana that will establish directions for future research.

METHODOLOGY

Study Design: Cross-sectional study.

Settings: Department of Medicine and Department of Periodontology at Chandka Medical College Hospital and Bibi Asifa Dental College Hospital Larkana Pakistan.

Duration: Six months from 01-08-2019 to 31-01-2020.

Sample Technique: Non probability consecutive sampling.

Sample Size: Study consists of 100 patients of cirrhosis.

Inclusion Criteria: All the diagnosed patients of hepatic cirrhosis as per either elastography and/or clinical, ultrasonic, and biochemical findings having, age >18 years having and either of gender were included in the study.

Exclusion Criteria: All the smoker and wearing dental braces patients and those were on cardiac treatment, diuretic therapy, on immunosuppressive drugs and on antibiotic therapy with in last 6 months were excluded.

Data Collection Procedure: Informed consent was taken from each patient. Patients were interviewed regarding age, smoking status, any comorbidity, and oral care practices (such as frequencies of dental visits and tooth brushing). Severity of hepatic cirrhosis was evaluated by Child-Pugh classification taking help of gastroenterologists. Periodontitis was defined as progressive chronic inflammatory destruction of connective tissue of tooth and surrounding structures eventually leads to tooth loss.² Periodontitis was classified according to previous

publish studies;^{9,10} as; mild periodontitis = 1 to 2 millimeters of clinical attachment loss (CAL), Moderate periodontitis = 3 to 4 millimeter (CAL) and Severe periodontitis = 5 millimeter or more (CAL).

Oral Examination: The dental diagram of full mouth was utilized and every tooth was examined for each tooth position. The dental plaque was graded as no plaque =0, whenever required after probing over the surface of the tooth, and apparent plaque=1, modified plaque index of Silness and Loe. The clinical probing depth (PD) was determined longitudinal to parallel axis of tooth, from free gingival margins to the base of periodontal pocket, namely to the periodontal probe's tip. CAL is described as the distance between periodontal probe's tip and cemento-enamel junction (CEJ). By deducting these values from PD, the distance between CEJ and free gingival margins was determined and CAL was evaluated. It was deemed as a sign of gingival recession if there was receded gingival margin and revealed CEJ, and a negative value was documented and added to PD. CAL and PD were measured in millimeters and the closest millimeters was registered. Bleeding on probing (BOP) was reported as zero "0" if no bleeding was found and one "1" when bleeding happened within 15 seconds after probing. For all parameters of every patient, average values were determined. All the data was recorded in the study proforma.

Data Analysis: Statistical analysis of data was performed by SPSS version 20.0 Description statistics were calculated including percentage and frequency for gender, child Pugh classification and severity of periodontitis. Mean±SD (standard deviation) were calculated for numerical data. Effect modifiers were specified like age, gender; to assess their effect on outcome variable post stratification chi-square test was applied and p value <0.05 was considered as significant.

RESULTS

Total 100 cirrhosis patients were studied, patients mean age was 46.10±9.01 years and average of disease duration was 2.10±1.7 years. Males were most common 62.0% and females were 38.0%. According to child Pugh classification 52.0% patients were seen class III, followed by 25.0% had class II and remaining were presented with class I. Table 1

Plaque was seen almost in all cases 98.0%. However, 33.0% had mild to Moderate gingival inflammation, 28.0% had Mild to Moderate gingival inflammation and 36.0% patients seen with sever gingivitis tends to bleed and ulcerate. Table 2

According to the periodontal index most of the cases had moderate and severe periodontitis 36.0% and 35.0% respectively, 26.0% had mild periodontitis, while only 03.0% patients had no periodontitis. Figure 1

Moderate and severe periodontitis were significantly high in patients having age more than 40 years (p=0.001). Among females moderate and severe periodontitis was higher as compared to males (p=0.001). Moderate to severe periodontitis was significantly associated with child Pugh class II and III, (p=0.001). There was no significant association between severity of periodontitis and duration of cirrhosis. Table 3

Table 1: Demographic statistics of the patients n=100

Variables		Statistics	
Age	(mean±SD)	46.10±9.01 years	
Gender	Male	62	62.0%
	Female	38	38.0%
	Total	100	100.0%
Duration of disease	(mean±SD)	3.10±1.7 years	
Child Pugh classification	Class-A	25	25.0%
	Class-B	23	23.0%
	Class-C	52	52.0%
	Total	100	100.0%

Table 2: Demographic statistics of the patients n=100

Variables		Frequency	Percent
Plaque	Present	98	98.0%
	Absent	02	02.0%
Gingivitis	No signs of inflammation	03	03.0%
	Mild to Moderate gingival inflammation, not around tooth	33	33.0%
	Mild to Moderate gingival inflammation around tooth	28	28.0%
	Sever gingivitis tend to bleed and ulcerate	36	36.0%

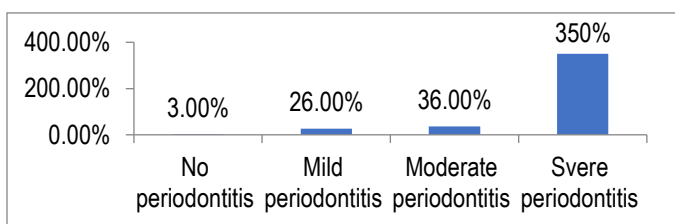


Figure 1: Patients distribution according to periodontal index n=100

Table 3: Periodontal index according to age, gender and severity of cirrhosis n=100

Variables		Periodontal index				p-value
		No	Mild	Moderate	Severe	
Age	18-40 Years	1	23	10	9	0.001
	41-60 Years	1	2	24	23	
	>60 Years	1	1	2	3	
Gender	Male	1	26	15	20	0.001
	Female	2	0	21	15	
Child Pugh classification	Class-A	1	24	0	0	0.001
	Class-B	0	1	14	8	
	Class-C	2	1	22	27	
Duration of cirrhosis	1-3 years	2	23	31	32	0.526
	4-5 years	1	2	5	3	
	>5 years	0	1	0	0	

DISCUSSION

Different systemic disorders, such as liver cirrhosis, can be correlated with periodontal condition, which is a cause of chronic and subclinical infection. 2 Periodontal and persistent hepatic conditions have a two-directional adverse influence upon one another. This is due to the infectious nature of these two conditions and the essential hepatic function in the body in bacterial elimination.^{11,12}

Serum cytokine is elevated due to hepatic dysfunction among cirrhotic patients. This may be involved in the detrimental phase of periodontal condition, likely by activation of the metalloproteinase and collagen function.¹² In this study patients mean age was 46.10±9.01 years and average of disease duration was 2.10±1.7 years. Males were most common 62.0% and females were 38.0%. Similarly Costa FO et al¹³ reported that out of 294 cases, males were 224 and females were 70, with mean age of 49.3±6.9 years. However, Ladegaard Grønkjær L et al¹⁴ reported a mean age of 61 years (age ranging from 21 to 87 years) and males were 120 (66%). In this study 33.0% had mild to Moderate gingival inflammation, 28.0% had Mild to Moderate gingival inflammation and 36.0% patients seen with sever gingivitis tends to bleed and ulcerate. In the study of Olczak-Kowalczyk D et al¹⁵ reported that in patients struggling with hepatic disease, more serious reports of gingivitis as well as a higher incidence of oral lesions have been evident.

In this study periodontitis was significantly predominant among patients of cirrhosis and most of the cases had moderate and severe periodontitis 36.0% and 35.0% respectively, 26.0% had mild periodontitis, while only 03.0% patients had no periodontitis. Similarly Costa FO et al¹³ stated that there is a high incidence of periodontal disease was noted among cases (62.2%) than controls (41.8%). On other hand a systemic review stated that In 4 studies, the recorded incidence of periodontitis among patients with cirrhosis varied between 25.0% and 68.75%, and apical periodontitis was observed among 49% to 79% of cases.² growing studies showed that periodontal disease may lead to the development of hepatic diseases like NALFD, cirrhosis and HCC, and also hepatic transplantations.¹⁶ Though, Grønkjær LL et al¹ recorded that periodontitis was server in the vast majority of cases (46%) and moderate in 39% of cases.

In this study moderate and severe periodontitis were significantly high in patients having age more than 40 years, female gender and having child Pugh class II and III, (p=0.001). Poor dental health can be caused by several variables, including age, educational status, depression, cognitive function, poor motivation, and medication usage. Several studies have studied the length of cirrhosis in periodontitis.^{17,2} People diagnosed to have cirrhosis for >3 years of duration have experienced more periodontal condition symptoms than those < 3 years of disease duration .² This suggests that with the progression of cirrhosis, the deterioration of periodontal disorders is associated with lack of oral health. Yet more research is, though, required to determine the correlation between the periodontitis and length of cirrhosis.

CONCLUSION

In the observation of this study the periodontitis rate was higher in patients of cirrhosis and it was significantly linked to child Pugh class II and III. During treatment dentists opinion should be taken to assess the oral health status and maintained among patients of cirrhosis.

LIMITATIONS

There were no significant limitations.

SUGGESTIONS / RECOMMENDATIONS

Factors linked to periodontal disease should be explored in cirrhotic patients to assess the link between causes and effects, the differences between cirrhosis etiology and duration, oral health practice and the role of comorbidities.

CONFLICT OF INTEREST / DISCLOSURE

There is no conflict of interests.

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