

Orodonal Changes Associated with Hepatic Disorders and it's Clinicopathological Implications

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Abstract

Background: Hepatic complex can be vulnerable to numerous diseases ascribed to the intake of few drugs, alcohol, or infections which manifests itself in oral cavity.

Materials and Methods: The patients diagnosed as acute or chronic liver disease by clinical examination, liver function tests, and morphological examination which was selected. Detailed dental and oral examination was done and manifestations such as the presence of gingival bleeding, oral lichen planus, xerostomia, sialadenitis, stomatitis, periodontal disease, and others were noted. The data were then subjected to statistical analysis.

Results: Jaundice due to viral hepatitis (44.7%), alcoholic liver diseases (28%), alcoholic cirrhosis (18.7%), cirrhosis of liver (16%), hepatomegaly (14.7%), hepatic carcinoma (7.3%), and hepatitis B (6%) were the various liver disorders encountered. On oral examination, a significantly higher number of study subjects were detected with one or more oral abnormalities when compared to subjects ($P \leq 0.05$). Oral manifestations include periodontitis, halitosis, xerostomia, bald tongue, fissured tongue, hyperpigmentation, candidiasis, and oral lichen planus.

Conclusion: The complex mechanism of liver and its susceptibility to a variety of dysfunction can not only have systemic but also many oral manifestations.

Key words: Hepatic disorders, Liver diseases, Orodonal manifestations

INTRODUCTION

Oral cavity is the gateway to diagnosis of many systemic disorders.^[1] It has a role in many physiologic processes among which digestion is an important complex process. Liver is the largest internal organ which serves in bile production, excretion of bilirubin, cholesterol, hormones, drugs, metabolism of fats, proteins, carbohydrates, and enzyme activation.^[2] Thus, the liver diseases cause systemic disturbances which manifest itself in oral cavity.

The most common systemic disorders are associated with liver diseases. These can be acute or chronic depending on

the onset, deranged function, and extent of organ damage. Infectious diseases of liver include hepatitis A, B, C, D, and E. The non-infectious may range from steatosis or fatty liver to hepatocellular carcinoma, including hepatitis, fibrosis, and cirrhosis of liver. This may be due to substance abuse such as alcohol and drugs, for example, paracetamol, ketoconazole, methotrexate, etc. Liver dysfunction includes change in metabolism of carbohydrates, fats, lipids, proteins, bilirubin, and hormones.^[3] Evidence of these disorders can be appreciated in the oral cavity which includes gingival bleeding, ecchymosis, hematoma, delayed mucosal healing, and lichen planus.^[4] The early findings in hepatitis B and C are infection of the periodontium and compromised oral hygiene. In patients with chronic hepatitis C virus (HCV) liver disease, the common oral manifestations are xerostomia, Sjogren's syndrome, lichen planus, sialadenitis, and oral malignancies.^[5-7] A mandibular swelling can be an initial manifestation in metastatic hepatocellular carcinoma.^[8] This study aims to evaluate the orodental manifestations in the various infectious, non-infectious, and acute and chronic liver diseases.

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MATERIALS AND METHODS

This cross-sectional study comprised 200 individuals including 150 diagnosed cases of various liver diseases and 50 healthy age- and sex-matched individuals who were randomly selected as control group. The patients diagnosed as acute or chronic liver disease by clinical examination, liver function tests, and morphological examination which was selected from the outpatient and inpatient Department of Hepatology, Sri Ram Chandra Bhanja (SCB) Medical College and Hospital, Cuttack, Odisha. Demographic data as well as details such as liver function test which includes serum glutamic oxaloacetic transaminase (SGOT), serum glutamic pyruvic transaminase (SGPT), serum albumin, serum bilirubin, and alkaline phosphatase were recorded. These patients were subjected to detailed dental and oral examination and manifestations such as the presence of gingival bleeding, oral lichen planus, xerostomia, sialadenitis, stomatitis, periodontal disease, and others were noted. Patients diagnosed with acute or chronic liver disease and without other systemic conditions such as diabetes mellitus and hypertension were included in the study. Individuals with other systemic diseases such as cardiac failure, on diuretic therapy, chronic kidney disease, on drugs which alter renal profile and electrolytes, patients undergoing hemodialysis and peritoneal dialysis, recent trauma, surgery, and burns were excluded from the study. This study was approved by the Institutional Ethics Committee, S.C.B Dental College and Hospital, Cuttack, Odisha, and informed consent was obtained from the participants participating in the study.

The data collected were subjected to statistical analysis by Statistical Package for the Social Sciences software, version 22.0. Chi-square test was applied and $P \leq 0.05$ was considered statistically significant.

RESULTS

A total of 200 subjects comprising of both the genders were observed in the present study of which 136 were male and 64 were female, that is, 68% and 32%, respectively. The age of the patients ranged from 24 to 82 years. Jaundice due to viral hepatitis (44.7%), alcoholic liver diseases (28%), alcoholic cirrhosis (18.7%), cirrhosis of liver (16%), hepatomegaly (14.7%), hepatic carcinoma (7.3%), and hepatitis B (6%) were the various liver disorders encountered [Figure 1]. On oral examination, a significantly higher number, that is, 126 among 150 study subjects were detected with one or more oral abnormalities when compared to 19 among 50 control subjects ($P \leq 0.05$). The oral lesions which were detected are charted in percentage in Figure 2. They include

periodontitis, halitosis, xerostomia, bald tongue, fissured tongue, hyperpigmentation, candidiasis, and oral lichen planus [Table 1].

DISCUSSION

Chronic alcohol abuse causes extensive damage to the liver which, in turn, manifests as acute and chronic systemic

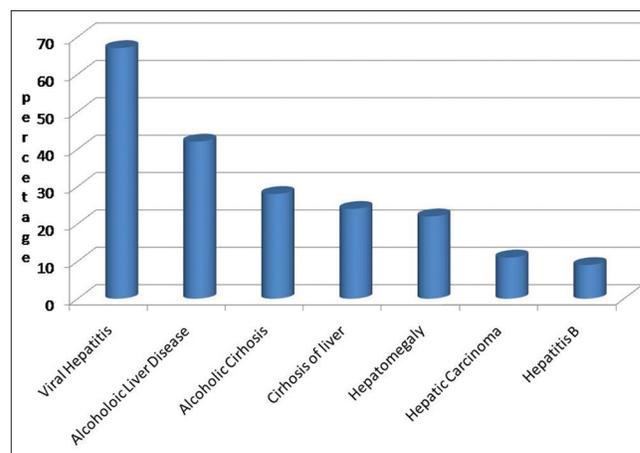


Figure 1: The various hepatic diseases encountered

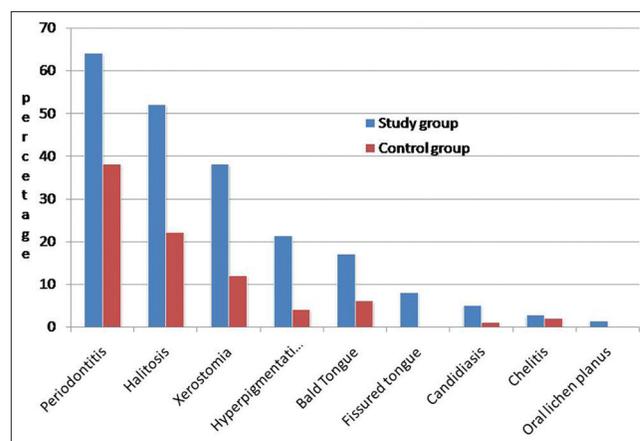


Figure 2: The various orodental manifestations found in the hepatic disorders

Table 1: Orodonal manifestations associated with liver disorders

Oro-dental manifestations	Study group (n=150) (%)	Control group (n=50) (%)	Significance
Periodontitis	96 (64)	16 (38)	$P \leq 0.05$
Halitosis	78 (52)	11(22)	
Xerostomia	57 (38)	6 (12)	
Hyperpigmentation	32 (21.3)	2 (4)	
Bald tongue	26 (17.3)	3 (6)	
Fissured tongue	12 (8)	0	
Candidiasis	7 (5.3)	1 (2)	
Cheilitis	3 (2.7)	1 (2)	
Oral lichen planus	2 (1.3)	0	

dysfunction. This systemic dysfunction causes wide range of oral changes which in the current study we have attempted to bring to light.

A significantly higher incidence of periodontitis (65%) was observed in patients with liver diseases than the healthy individuals in our study. Paraschiv *et al.*^[9] in his study among 150 patients of hepatitis B found 46.7% of patients suffering with periodontitis. According to a systematic review on periodontal disease and liver cirrhosis, the prevalence of periodontal disease in cirrhosis patients ranged from 25.0% to 68.75%.^[10] Novacek *et al.*^[11] observed a significant increase in loss of attachment in their study on patients with alcoholic cirrhosis due to poor dental care and alcohol abuse. Movin *et al.* in his study suggested that periodontal condition aggravates as the cirrhotic condition aggravates due to increasing negligence in oral hygiene.^[12] Han *et al.* hypothesized that periodontitis might have an important role in the progression of liver disease in non-alcoholic liver diseases.^[13]

Halitosis due to severe liver disease, also known as “Foeter hepaticus,” is caused by excretion of dimethyl disulfide and methyl mercaptan arising from an excess of methionine. This results in a sweet and musty smell both on the breath and in urine.^[14] Patients with viral hepatitis have an elevated level of dimethyl sulfide.^[15] A significant number of patients (38.7%) had bad breath when compared with healthy individuals in our study.

Chronic alcoholics can develop sialadenosis which can be a result of ethanol-induced peripheral autonomic neuropathy giving rise to alterations in salivary metabolism and secretion.^[16] In the present study, 38% of the study group presented with xerostomia in contrast to 12% of the control group. Guggenheimer *et al.*^[17] reported clinical hyposalivation 28.7% of all patients and 70% of those who were on diuretic therapy. Many researchers also observed xerostomia among 5–55% of HCV-infected patients.^[18-23]

About 21% of cases presented with hyperpigmentation in contrast with a lower percentage of case in a study by Sulka *et al.*^[24] This finding might be secondary to drugs used for the treatment as stated by Tsilika *et al.*^[23] and Erdoğan *et al.*^[25]

In our study, about 3% of the study group showed angular cheilitis which was in consonance with the study by Guggenheimer *et al.*^[17] who reported a prevalence of 4% in liver transplant cases. They also reported predominance of fissured tongue (37%) and atrophy of the papillae of the tongue (18%) in their study. Reports suggest that fissured tongue, atrophy of tongue papillae, and angular cheilitis can be observed in liver transplant patients which can be because of drug induced hyposalivation.^[17,25] Patients with

alcoholic liver disease can manifest with glossitis, angular cheilitis, and gingivitis, frequently along with nutritional deficiencies.^[26]

Oral candidiasis is an opportunistic fungal infection caused mainly by *Candida albicans* primarily attributed to the immunocompromised conditions such as diabetes mellitus or in denture wearers. Paraschiv *et al.*^[9] in their study on 380 patients with hepatitis B and C in association with diabetes mellitus, 14% presented with oral candidiasis. In the present study, we found significantly decrease prevalence of oral candidiasis (5.3%) which may be attributed to the fact that none of the cases had undergone liver transplantation and immunosuppression therapy.

A number of different liver pathologies have been found to be associated with lichen planus which is a chronic inflammatory disease affecting skin and mucous membrane.^[27] In our study, we observed 3 patients (1.3%) with oral lichen planus without skin manifestations which was in accordance with the study by Paraschiv *et al.*^[9] They also found three patients with both mucosal and cutaneous lesion among the 230 cases of viral hepatitis (hepatitis C) which were seen in patients over 60 years of age. A significantly higher percentage of 5.1% was observed by Friedrich *et al.*^[28] among 156 patients and 4.7% among 126 patients by Figueiredo *et al.*^[29] Gandolfo *et al.*^[30] found 24% of hepatopathies among 96 OLP cases and 60% without definite liver disorders but having least one abnormal liver parameter. They concluded a frequent association of OLP with hepatic damage and OLP might be an important clinical sign of symptomless hepatopathies.

CONCLUSION

The complex mechanism of liver and its susceptibility to a variety of dysfunction can not only have systemic but also many oral manifestations. An extensive liver damage can cause destruction of liver cells causing hepatitis, cirrhosis. Hepatic carcinoma is considered to be one of the most common cancers in global population today. The causes for such damage vary from intake of alcohols, drugs, and viral infestation. The changes manifested in the oral cavity, thus help the clinicians to have a hint at a systemic disorder.

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