

# Dental and Oral Mucosal Findings among Patients with Liver Disease : Correlation with *Helicobacter pylori* Infection

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## **Introduction**

Viral hepatitis has great impact on dentistry because of the possible transmission of many of these viruses in the dental clinics. Furthermore, the consequent chronic illnesses that viral hepatitis may cause pose challenge to dental health workers. Aside from legal and ethical issues in treating those cases, patients may ultimately develop serious liver disfunction with concerning risk during non-invasive and invasive dental procedures. Extra hepatic conditions associated with chronic liver disease (CLD) are usually associated with exacerbation of immune disorders. Among most common is lichen planus of skin and oral cavity, salivary gland disorders and glomerulonephritis. Decreased salivary flow rate precipitates to increase caries index, mucosal fungal infections and periodontal disease. Stomach was also identified as a possible extra hepatic site for hepatitis C virus (HCV) infection, consequently HCV was researched as a possible co-infection with *Helicobacter-pylori* (H-pylori), a common stomach bacterial infection. H-pylori resides in the oral cavity, saliva and dental plaque.

### **Aims of the study**

1. To detect *H. pylori* seropositivity in endoscopy patients with hepatic disease.
2. To detect the presence of anti *H. pylori* antibodies in saliva of endoscopy patients with liver diseases.
3. To correlate salivary antibody positivity of *H. pylori* with CLO and gastric biopsy test results.
4. To detect the prevalence of carious, missing, filled teeth (DMFT) and root caries in patients with chronic liver diseases.
5. To determine salivary flow rate in hepatic disease patients and correlate it with DMFT and root caries findings.
6. To detect prevalence of oral lichen planus in patients with liver disease.

### **Materials and methods**

All participants were recruited from endoscopy unit at KAUH.

#### **I. Patients and samples**

The participants were divided into 2 major groups: CLDs and controls.

The CLDs included patients diagnosed with hepatitis B and C viruses (HBV, HCV), patients with hepatic autoimmune diseases,

schistosomiasis and cryptogenic liver disease. These patients attended endoscopy unit for gastric, duodenal or esophageal diseases.

Control: patients were attending endoscopy unit because of gastric diseases and were free from liver diseases.

## **II. Blood samples**

From every participant, 5 ml of venous blood were drawn, spun and separated within 1 hour after collection. The following were assessed: alanine transaminase (ALT), aspartate transaminase (AST), alkaline phosphatase (ALP), albumin (ALB) and bilirubin (BIL). Upon patients' approval, H-pylori antibody was tested after storage in  $-20^{\circ}\text{C}$  till using ELISA.

## **III. Saliva samples**

From every participant, whole unstimulated saliva was collected over a certain period of time by spitting in a sterile, graduated test tube. Samples were measured by pipette and a ratio of amount/time was calculated for each participant. Saliva was then spun and supernatant was stored in  $-20^{\circ}\text{C}$  until analyzed for H-pylori antibodies using ELISA. For some patients, gastric biopsies were obtained and CLO (Campylobacter like organism) test was performed.

## **IV. Intra oral examination**

This phase was carried out in 2 steps:

A. Tooth examination of CLDs and controls for which every participant had an index reflecting number of decayed (D), filled (F) and missing (M) tooth roots (R). This root caries index was designated as RCI.

B. Oral mucosal examination:

Lesions of oral mucosa were identified in all participants as of lesion's appearance, location, size...etc. Photographs and biopsies were taken when necessary and when consented by patients' physician.

#### **V. Statistical analysis:**

Outcome variables and independent variables were coded and data was fed into a computer and analyzed using SPSS.

### **Results**

Among CLD participants, 63 (55.3%) were males and 51 (44.7%) were females, whereas controls were 25 (50%) and 25 (50%) respectively. Mean age of CLDs was  $(49.6 \pm 15.1)$  and  $(37.9 \pm 14.2)$  years for controls. Most common endoscopy finding was gastritis, followed by esophageal varices then duodenitis. Values of liver function tests were obtained. Using CLO test H-pylori was positive in 51.7% of CLDs and 39.3% of controls ( $p < 0.177$ ), while saliva antibody test was positive in 37.2% vs 81% ( $p < 0.001$ ) and 87.5% vs 92.6% were positive using serum antibody

( $p < 0.553$ ). Salivary H-pylori antibody positivity was insignificantly associated with gender, age, salivary flow or birthplace of participants.

Salivary flow rate was significantly higher in males ( $p < 0.03$ ) and insignificantly related to H-pylori positivity or type of liver disease. Root caries index was significantly higher in CLDs ( $p < 0.008$ ), also significantly associated with salivary flow rate ( $p < 0.02$ ) and in HBV seropositives ( $p < 0.015$ ). Lichen planus was found in 4 patients with HCV and 1 with HBV. All lesions were found on buccal mucosa and occasionally in other intraoral sites as well. Only one patient had skin lesions accompanying oral lesions. As screening test, using CLO as reference salivary antibody had highest positive predictive value (62.2%), while serum antibody test has highest negative predictive value (100%).

### **Conclusions**

1. Among the studied endoscopy patients, place of birth correlated with chronic liver disease (CLD) but did not correlate to age and gender.
2. Most common endoscopy finding was gastritis and most common chronic liver disease was HCV infection.
3. Root caries was significantly more common among CLDs where

salivary flow rate was significantly lower than controls. Root caries was also significantly higher in older age groups and in males than females.

4. Oral lichen planus was found exclusively in CLDs. Four patients were HCV +ve and one as HBV +ve.
5. Oral lichen planus was accompanied by skin lesions in one HCV +ve patient only.
6. *H. pylori* CLO +ve were more among CLDs while saliva positivity was more among controls.
7. In CLDs salivary *H-pylori* positivity was significantly higher among males and in older age patients.
8. Among CLDs, considering CLO as reference, saliva *anti-H.pylori* anti body test shows high specificity and low sensitivity.

### **Recommendations**

1. In dental clinics, patients with chronic liver disease must be managed for possible extra hepatic diseases and should not be only labeled as potentially infectious.
2. Oral lichen planus must be examined-for in viral hepatitis patients and vice versa, i.e. patients with lichen planus should be screened for viral hepatitis.
3. Patients with CLDs must be evaluated for salivary flow and consequently for caries index in general and tooth root caries in particular.
4. Root caries, although uncommon among normal population is prevalent among CLDs. These patients must be examined for root caries in order to provide early treatment and avoid premature tooth loss.
5. Salivary *H-pylori* antibody is a valid specific and, non-invasive test for detection of the organism. However, it does not correlate with status of gastric infection.

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# دراسة وجود أمراض الأسنان والغشاء المخاطي لتجويف الفم في الأشخاص المصابين بأمراض الكبد : العلاقة بالإيجابية للجراثومة الحلزونية البوابية

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**المستخلص :** تعتبر أمراض الكبد المزمنة وخاصة الفيروسية منها ذات أهمية كبيرة لممارس طب الأسنان . بغض النظر عن احتمال انتقال العدوى الفيروسية في عيادات طب الأسنان ، تؤدي أمراض الكبد والخلل في وظائفه أحياناً لظهور أمراض خارج الكبد .

في هذه الدراسة تم إشراك مرضى من وحدة المناظير منهم من يعاني من أمراض

الكبد المزمنة ، ومنهم من ليس عنده أي مرض كبدي . وتم فحص التالي لكل مريض :

١- أمراض الغشاء الفمي المخاطي وخاصة مرض الحزاز المنبسط .

٢- وجود تسوس في جذور الأسنان .

٣- وجود عدوى بالميكروب البوابي الحلزوني .

٤- وجود سيل اللعاب .

٥- أنزيمات كبدية .

وتم الكشف الفمي لكل مريض والحصول على عينة في حالة وجود الحزاز المنبسط وحالما سمحت حالة المريض . وتم تحديد سيل اللعاب بحسابه بمال / دقيقة ، وحساب وجود تسوس جذور الأسنان كنسبة مئوية مقارنة بعدد الأسنان الموجودة بفم المريض . كما تم الكشف عن الجراثومة الحلزونية بواسطة وجود الأجسام المضادة في اللعاب والدم واختبار CLO .

تم ادراج (١١٤) مريض كبدي و (٥٠) بدون مرض كبدي في هذه الدراسة منهم (٥٥,٣%) من السعوديين ومتوسط عمر (٤٩,٩) سنة . أكثر نتيجة للمناظير كانت الإلتهاب المعدي (٢٧,٢%) وأكبر نسبة مرض كبدي كانت التهاب الفيروس (س) (٤٢,٤%) . ووجد هناك ارتباط إحصائي بين نسبة القلة في سيل اللعاب ونسبة حدوث تسوس الجذور ، كما اكتشف الحزاز المنبسط في خمس مرضى كلهم من مرضى الفيروس الكبدي مما يدل على وجود علاقة بين العدوى بهذا الفيروس وحدث هذا المرض الفمي .

بالنسبة للجرثومة البوابية الحلزونية تم اكتشافها بواسطة CLO في (٥١,٧%) من المرضى، وبواسطة الاجسام المضادة للعاوية في (٨١%) من مرضى الكبد المزمن . وعند احتساب CLO كمرجع يمكن القول بأن اختبار اللعاب لهذه الجرثومة ذو نسبة حساسية ايجابية بنسبة (٣٦,٦%) وحساسية سلبية بنسبة (٧٥,٨%) .