Dental Problems Associated with Hepatitis C Infection: A Report from Iran

Nima Mahboobi¹, Leila Jafargholizadeh² and Seyed Moayed Alavian³*

¹Department of Oral and Maxillofacial Surgery, Tehran University of Medical Sciences, Tehran, Iran.
²Students' Scientific Research Center, Tehran University of Medical Sciences, Tehran, Iran.
³Baqiyatallah Research Center for Gastroenterology and Liver Diseases, Baqiyatallah University of Medical Sciences, Tehran, Iran.

Authors’ contributions

This work was carried out in collaboration between all authors. Authors NM and LJ designed the study, wrote the protocol and wrote the first draft of the manuscript. Authors LJ and SMA managed the literature searches. Author SMA revised the manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/BJMMR/2016/24324

Editor(s):
(1) Ibrahim El-Sayed M. El-Hakim, Ain Shams University, Egypt and Riyadh College of Dentistry and Pharmacy, Riyadh, Saudi Arabia.

Reviewers:
(1) Darko Nozic, Military Medical Academy, Belgrade, Serbia.
(2) Waqar Abd Alqahar Al-Kubaisy, Universiti Teknologi Mara (Uitm), Malaysia.

Complete Peer review History: http://www.sciencedomain.org/review-history/16379

Received 14th January 2016
Accepted 24th July 2016
Published 29th September 2016

ABSTRACT

Background: Infection with hepatitis C virus is a problem with global importance. Patients with HCV infection experience a wide spectrum of extrahepatic manifestations, a number of which occur in the oral cavity. Despite a large number of reports exist on the association of some oral conditions with HCV infection, little is known about dental problems of HCV infected patients.

Objectives: This study aimed at assessing dental problems in patients with HCV infection.

Materials and Methods: A questionnaire was used to collect patients’ demographic, oral health and HCV infection associated data. Plus, a routine dental screening was performed to obtain dental health status by using decayed teeth, missing teeth and filled teeth (DMF) index.

Results: Seventy-three patients enrolled in this study. More than 40% of the participants brushed their teeth less than once a day and only 18 participants used dental floss. None of the participants routinely visited a dentist for dental checkups. Almost 40% of the participants expressed that they have not informed their dentist of their HCV infection and/or they would not do it in future. DMF
index showed an average of 17.5 counting 5.8, 3.2 and 8.5 for decayed, missing and filled teeth respectively. History of drug abuse as well as brushing teeth showed significant association with DMFT in patients with HCV infection (P<0.05).

**Conclusion:** The results of the current study showed poor oral health status among HCV infected individuals in Iran. Patients education about dental common conditions associated with HCV might help in improving their oral health status. Routine periodical dental check up in patients with HCV is recommended.

**Keywords:** Hepatitis C; oral health; dental treatment; Iran; DMFT; oral diseases.

1. **INTRODUCTION**

Hepatitis C virus (HCV) is an enveloped, single stranded positive-sense RNA virus, having a diameter of about 50 nm and classified as a separate genus (Hepacivirus) within the Flaviviridae family [1]. At the beginning of the third millennium, with more than 170 million chronically infected people (3% of the world’s population), HCV is considered as a disease of significant global importance. Although HCV infection incidence is lower than that of hepatitis B virus (HBV) in many parts of the world, the rate of its chronic infection is much higher and its mortality rate is increasing [2-4].

Patients with HCV infection experience a wide spectrum of extrahepatic manifestations (EHMs). A number of which occur in the oral cavity. It is believed that HCV EHMs are influenced by the virus itself or the host immune response following HCV infection, the mechanism of most of which remains unclear [5-7]. In a previous report we reviewed a number of oral conditions that patients with HCV infection might confront. There are a large number of reports on the association of oral conditions (such as lichen planus and Sjogren’s syndrome) with HCV infection. However, little is known about dental health status of the patients with HCV [8]. Therefore the aim of the current study was to assess dental health in patients infected by HCV.

2. **MATERIALS AND METHODS**

A cross-sectional study was performed between July 2013 and February 2014 in Tehran Hepatitis Center (THC), one of the referral centers of patients with viral hepatitis infection. The protocol of the current study was approved by the research ethics committee of the institute (THC).

A sample of 73 HCV patients in whom infection was confirmed by polymerase chain reaction (PCR) test were enrolled in the current study. Each patient was interviewed using a well-structured questionnaire. This questionnaire contained socio-demographic (such as age and sex), medical (such as blood transfusion, drug abuses, HCV duration and treatment), oral hygiene (frequency of brushing teeth and visiting a dentist) and dental health status sessions. To obtain the last mentioned item, a routine dental screening has been performed by a dentist. We used a screening index for dental health status assessing dental caries, missing teeth and filled teeth known as DMF. In addition a routine oral examination was also performed to evaluate if the patient has oral conditions or not. To evaluate gingival condition, probing test was performed. So that in case of gingival inflammation gingivitis and in case of bone recession periodontitis was acknowledged. It took approximately 10 minutes to collect information of each patient.

Data were analyzed using descriptive statistics (such as mean, median and standard deviation), chi square and student’s t-test in the statistical package for the social sciences (SPSS, Chicago, Ill) version 15. In all findings P<0.05 was considered as statistical significance limitation.

3. **RESULTS**

Of the 73 patients, 54 (74%) were male. The mean age of all patients was 42.6±16.7 years with a range of 21-74 years. Fifty-eight patients had started HCV related treatment when data were collecting. None of the patients showed a history of organ transplantation. However, 20 patients (27.4%) had a history of blood transfusion. More than one third of the patients (N: 28; 38.4%) mentioned that they did not inform their dentist about their HCV infection or would not do it in future. Approximately 80% addressed an inappropriate reaction of a health care worker in the past as the reason of this attitude. Others thought it was not necessary to inform a dentist about the condition. A detailed breakdown of patients’ information is described in Table 1.
When patients were asked their dental/oral problems, pain (32.9%), dry mouth (30.1%) and need for denture (25.0%) were addressed more frequently.

DMF index showed an average of 17.5±5.3 per patient, counting 5.8, 8.5 and 3.2 for decayed teeth, missing teeth and filled teeth respectively. Using chi square test, DMF index was significantly associated with a history of drug abuse and brushing teeth (P<0.04 and P<0.05 respectively).

During routine dental/oral health screening gingival health was also assessed by a periodontal probe. Gingival conditions found in more than 75% of patients (41.1% gingivitis and 35.6% periodontitis). Chi square test showed that gingival conditions were significantly associated with a history of drug abuse and brushing teeth (P<0.01 and P<0.05 respectively). However, gingival conditions were not significantly associated with long history of disease and antiviral treatments.

4. DISCUSSION

Infection with HCV is an issue with global importance. It is believed that patients with HCV infection are prone to be at higher risk of dental problems. A possible hypothesis is lower salivary flow rate; either because of virus replication in their salivary glands or using antiviral drugs. Additionally, viral hepatitis infected patients repeatedly show consequent conditions such as abusing drugs, smoking and lower socioeconomic status that might cause more serious dental problems [2,7-9].

In the current study dental problems were significantly associated with a history of drug abuse and lower rates of brushing teeth. Surprisingly, a large number of patients did not see a dentist despite they were aware of their dental problems. This finding might be attributed to the economic status of HCV infected individuals in Iran.

DMF index showed a high rate in HCV infected patients. Our finding was three fold higher than a previous study on patients with primary antibody deficiencies in Iran [10]. However, it was close to a previous report on chemical warfare victims in Iran (DMF: 17.0, SD: 6.7) [11], patients with HIV infection receiving active antiviral therapy (DMF: 15.1, SD: 6.1) [12] and Iranian hemodialysis patients (DMF: 18.6, SD: 9.9) [13]. In a study from Australia performed in 2001 HCV infected patients showed approximately 2 fold higher DMF index in comparison with healthy control.

Table 1. Demographic and infection associated data as well as dental health status information of patients with HCV infection

| Item in checklist                  | Details                  | N* (%)  |
|------------------------------------|--------------------------|---------|
| Sex                                | Male                     | 54 (74.0) |
|                                    | Female                   | 19 (26.0) |
| History of blood transfusion       | Less than 5 years ago    | 20 (27.4) |
| The time of HCV diagnosis          | Between 5 and 10 years   | 14 (19.2) |
|                                    | More than 10 years       | 25 (34.2) |
| Tooth brushing**                   | Less than once a day     | 34 (46.6) |
|                                    | Once a day               | 30 (41.1) |
|                                    | More than once a day     | 23 (31.5) |
| Using dental floss**               | Routinely                | 18 (29.0) |
| Visiting a dentist                 | During past year         | 0 (0)    |
|                                    | Between 1 and 5 years    | 13 (17.8) |
|                                    | More than 5 years        | 33 (45.2) |
| History of smoking                 | Never                    | 21 (28.8) |
| History of drug abuse              |                          | 6 (8.2)  |
| History of unprotected sexual contact |                        | 38 (52)  |
| Resistance against informing dentist about their HCV infection | | 20 (27.4) |
|                                   |                          | 11 (15.1) |
|                                   |                          | 28 (38.4) |

*Of 73 patients, **eleven edentulous patients were excluded here
group [14]. In the present study the number of filled teeth was remarkably less than decayed or missing teeth, which shows lack of dental health’s attention amongst Iranian HCV infected patients.

Our patients notably brushed their teeth lower than a previous report in Spain [15]. Only 11% of our HCV infected individuals brushed their teeth more than once a day in contrast to 56% in Spain. In addition, the number of patients who brushed their teeth less than once a day showed a notable higher rate in our study (40%) in comparison with the aforementioned study (25%). Dental check-ups were also notably less in our patients.

Only less than one-fifth of our participants visited a dentist in the last year. Meanwhile, more than 40% of the patients of the previous report from Spain visited a dentist in the last year. These findings describes that economic situation and lack of governmental centers for special patients’ dental care are not the only limitations of HCV infected patients in Iran. We also need to change their attitude towards the importance of dental/ oral health on their lives. Education of the patients on dental health seems to be an essential step for the improvement of this situation.

To our knowledge this is the first study evaluating dental health of Iranian HCV infected patients. In addition, patients of the current survey were gathered from Tehran Hepatitis Center, a referral center for patients with viral hepatitis in the country. Therefore, we believe that our results can be attributed to HCV infected patients of the country.

5. CONCLUSION

The results of the current study showed a high demand of dental care in Iranian patients with HCV infection. Despite the availability of a special dental center for infected patients in Tehran, the long waiting lists of patients demanding dental care as well as severity of the problems make such centers inefficient. Therefore, expanding such services in all country will certainly improve the situation of dental problems in HCV infected patients. Studies evaluating dental health before and after an education are recommended.

CONSENT

It is not applicable. No treatment or intervention was performed on the participants.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Pol S, Vallet-Pichard A, Corouge M, Mallet VO. Hepatitis C: Epidemiology, diagnosis, natural history and therapy. Contrib Nephrol. 2012;176:1-9.
2. Mahboobi N, Porter S, Karayiannis P, Alavian SM. Oral fluid and hepatitis A, B and C: A literature review. J Oral Pathol Med. 2012;41(7):505-16.
3. El-Serag HB. Epidemiology of viral hepatitis and hepatocellular carcinoma. Gastroenterology. 2012;142:1264-73.e1.
4. Mahboobi N, Porter S, Karayiannis P, Alavian SM. Dental treatment as a risk factor for hepatitis B and C viral infection. A review of the recent literature. J Gastrointestin Liver Dis. 2013 22(1):79-86.
5. Ali A, Zein N. Hepatitis C infection: A systemic disease with extrahepatic manifestations. Cleve Clin J Med. 2005;72:1005-8:10-4,16 passim.
6. Nagao Y, Sata M. Hepatitis C virus and lichen planus. J Gastroenterol Hepatol. 2004;19(1101-13).
7. Mahboobi N, Haghighi Z. Effect of ribavirin therapy on salivary gland function: An oral medicine prospective. Hepat Mon. 2011;11(1):925-6.
8. Alavian SM, Mahboobi N, Mahboobi Nima, Karayiannis P. Oral conditions associated with hepatitis C virus infection. Saudi J Gastroenterol. 2013;19(6):245-51.
9. Mahboobi N, Agha-Hosseini F, Lankarani KB. Hepatitis C virus and lichen planus: The real association. Hepat Mon. 2010;10(3):161-4.
10. Meighani G, Aghamohammadi A, Javanbakht H, Abolhassani H, Nikayin S, Jafari SM, Ghandehari Motlagh M, Shamshiri AR, Rezaei N. Oral and dental health status in patients with primary antibody deficiencies. Iran J Allergy Asthma Immunol. 2011;10(4):289-93.
11. Mottaghi A, Hoseinzade A, Zamani E, Araghizade HA. Status of dental health in chemical warfare victims: The case of Isfahan, Iran. Indian J Dent Res. 2012;23(4):506-8.
12. Rezaei-Soufi L, Davoodi P, Abdolsamadi HR, Jazaeri M, Malekzadeh H. Dental
13. Malekmakan L, Haghpanah S, Pakfetar M, Ebrahimic Z, Hasanlic E. Oral health status in Iranian hemodialysis patients. Indian J Nephrol. 2011;21(4):235-8.

14. Coates EA, Brennan D, Logan RM, Goss AN, Scopacasa B, Spencer AJ. Hepatitis C infection and associated oral health problems. Aust Dent J. 2000;45:108-14.

15. Díaz-Ortiz ML M-LJ, Gargallo-Albiol J, Baliellas-Comellas C, Berini-Aytés L, Gay-Escoda C. Dental health in liver transplant patients. Med Oral Patol Oral Cir Bucal. 2005;10(1):66-72.