



Knowledge, Attitude, and Practice among Dentists towards Oral Herpetic Infections

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Authors' contributions

This work was carried out in collaboration among all authors. Author AAA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors DG and RS managed the analyses of the study. Author VR managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

During the course of the oral examination or during procedures, dentists, auxiliaries, and other healthcare personnel have an increased chance of getting exposed to various pathogens. There were about 80 known herpes viruses, and in that at least eight of them are known to cause infections in humans. Herpes labialis also known as cold sores is the most common orofacial form of recurrent HSV infection. The dentist should have a clear knowledge of herpetic infections because they are frequently exposed to patients who suffer from HSV infections. A close-ended questionnaire comprising 10 questions regarding encompassing major aspects of herpetic infections were prepared and distributed among dentists through an online survey. Data were tabulated and analyzed by computing the percentage response for each question. Proper awareness should be created among dentists for treating patients in their clinical practice. From this survey, it can be concluded that the majority of dental practitioners were aware of oral herpetic infections.

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1. INTRODUCTION

Dental health care professionals are meant to be at a higher risk of infections caused by various microorganisms including herpes simplex virus type I, hepatitis-B, hepatitis-C viruses, *M.tuberculosis*, streptococci, staphylococci, HIV, mumps, influenza, and rubella [1–3]. There are about 80 known herpes viruses, and in that at least eight of them are known to cause infections in humans. These include herpes simplex virus 1, herpes simplex virus 2, varicella-zoster virus, Epstein-Barr virus, cytomegalovirus, human herpes virus 6, human herpes virus 7, and Kaposi's sarcoma [4]. Out of these, orofacial infections are mostly caused by HSV-1 serotype [5].

Herpes simplex virus I belong to the subfamily alpha *Herpesviridae* and can give rise to oropharyngeal infections. After primary infection, these viruses establish latency in sensory neurons and get reactivated by injury, physical or emotional stress, fever, exposure to UV-light, immunosuppressive drugs, and hormonal changes [6].

Herpes labialis also known as cold sores is the most common orofacial form of recurrent HSV infection [7]. Initially, it manifests with a slight tingling and a sense of heat on a reddened point of the lip. Within a few hours, some blisters get filled with clear liquid, which is often painful, and they begin to develop in the same area as the initial point [8–10]. Rare complications including perioral scarring and depigmentation after healing of lesional areas can also occur [11,12]. The diagnosis of herpes labialis is usually based on case history, clinical appearance, and the location of the lesions. It can be confirmed by laboratory diagnosis in the form of viral culture, serology, polymerase chain reaction, direct fluorescent antibody testing, or Tzanck test which may be necessary for immunocompromised patients [13].

Herpes simplex virus infections are most efficiently treated with antiviral drugs such as acyclovir. However, resistance to acyclovir has been reported, mainly among immunocompromised patients and particularly in patients with an allogeneic bone marrow transplant [14].

Similar studies have shown that HSV-1 is a threat to the dental team which affects the skin

and the cornea causing herpetic whitlow and ophthalmic keratitis [15]. A high prevalence of HSV was noted in patients with chronic periodontitis compared to healthy subjects [16,17].

This survey was needed because dentists are frequently exposed to patients who suffer from recurrent HSV infections. During the course of the oral examination or during procedures, dentists, auxiliaries, and other healthcare personnel have an increased chance of getting exposed to the various number of pathogens. The authors report on the importance of raising awareness among healthcare professionals, particularly dentists, regarding the risks to which they are exposed when performing procedures on patients infected with the herpes simplex virus type 1 (HSV-1). HSV-1 produces orolabial lesions and therefore, these professionals need to be cautious when coming into contact with the vesicles.

Previously our department has published extensive research on various aspects of prosthetic dentistry [18–28], this vast research experience has inspired us to research on analyzing the knowledge, attitude, and practice among dentists towards oral herpetic infections and to make sure that dentist should follow necessary protocols while treating patients affected with herpes. Therefore, the aim of this present survey was to assess the awareness and knowledge among dental professionals towards oral herpetic infections.

2. MATERIALS AND METHODS

A cross-sectional survey was conducted among dentists in a private dental college, Chennai. A structured, self-administrable questionnaire consisting of ten questions encompassing major aspects of herpetic infections were prepared and distributed among dentists through an online survey. The survey includes questions to assess the dentist's knowledge of oral herpes were distributed. The dentists were permitted to choose more than one answer if they desired. The convenience sample size of 100 dental practitioners was decided. Only the 100 completed surveys were included and the others were excluded. Data were entered in Microsoft Excel sheets, analyzed in percentage by computing the responses for each question, and tabulation of results was done.

3. RESULTS AND DISCUSSION

From Table 1, it was found that in this study 76% of dental practitioners agreed that herpes can be cured permanently. 76% of participants were aware that turmeric extract can decrease herpetic infection. 64% of practitioners were aware of the dosage of drugs which are specifically targeted against herpetic infections. 73% of respondents agreed that acyclovir reduces the transmission of virus and it also inhibits the replication process. 62% of dental practitioners were aware of the new generation antivirals like helicase primase inhibitors in treating herpetic infections. 75% of participants thought that passive immunization from serum/globulin from immune persons helps to prevent herpetic infections.

From Fig. 1, it was found that 78% of dentists accepted that HSV I was more common compared to HSV II (22%).

From Fig. 2, it was found that the most commonly used drug against herpes among dentists was found to be acyclovir (54%) followed by foscarnet (17%), cidofovir (12%), ganciclovir (10%), fomivirsen (7%).

From Fig. 3, it was found that 72% of practitioners thought HSV-I gets transmitted by direct contact with lesional fluid or saliva followed by sexual (14%), perinatal (11%) and congenital transmission (3%).

From Fig. 4, it was found that 54% agreed that intravenous administration of acyclovir can be used in treating immunocompromised patients with herpes, followed by foscarnet (20%), cidofovir (19%), ganciclovir (4%), pritelivir (3%).

The awareness and knowledge among dentists regarding the oral herpetic infections in dental practice were well known and documented. The results of this present survey revealed that most dentists have clear cut knowledge regarding herpes and precautionary measures to be followed while treating herpetic patients. Most of the practitioners agreed that HSV-I was more common than HSV-II. McQuillan et al., in his study stated that the prevalence of herpes simplex virus type 1 was 47.8%, and the prevalence of herpes simplex virus type 2 was 11.9%. [29] Xu et al. stated that HSV-1 is more common than infections with HSV-2 at younger ages [30].

In this study, 76% of participants accepted that turmeric extract can decrease herpetic infection. Kutluay et al. demonstrated that curcumin-treated cells are indeed diminished in their ability to support HSV-1 infection and replication [31].

In this study, dental practitioners preferred acyclovir for treating herpetic infections. Acyclovir is currently one of the most effective antiherpetic agents. [32] Zarrouk et al., stated that acyclovir and its prodrug valacyclovir are used for treating diseases caused by herpes simplex virus 1, 2, and varicella-zoster virus [33]. Acyclovir is approved for the treatment of primary and recurrent genital HSV infection [34,35]. Acyclovir acts as a specific inhibitor of herpesvirus DNA polymerase. It showed good in-vitro activity against herpes simplex and varicella-zoster viruses [36].

In this study, 72% of practitioners agreed that HSV-I gets transmitted by direct contact with lesional fluid or saliva. Cerio et al., stated that direct contact with a cold sore is the main factor that people acquire HSV-1 [37]. Herpes Simplex Virus Type 1 is usually acquired through direct contact with infected lesions or body fluids typically saliva [38,39].

In this study, 62% of dental practitioners were aware of the new generation antivirals like helicase primase inhibitors in treating herpetic infections. Helicase-primase inhibitors inhibit the progression of the replication, an initial step in DNA synthesis by separating the double strand into two single strands [40]. Amenamevir, a herpesvirus helicase-primase inhibitor, is currently used for the treatment of herpes zoster in Japan [41].

In this study, 54% of respondents thought that acyclovir can be given intravenously for the treatment of herpes in immunocompromised patients. Spector et al., in his study concluded that acyclovir given by continuous intravenous infusion was helpful in the treatment of herpes virus infections in immunocompromised patients [42]. In immunocompromised patients with acyclovir-resistant herpes, foscarnet and cidofovir can be used [43,44].

This survey certainly has its own limitations. As the subjects were asked regarding their experiences in their practice over a wide frame of time, memory and subjective bias could have been possible, and also this survey was conducted in a small population. Hence, more

surveys should be required among dentists with a larger population to assess the knowledge regarding oral herpetic infections along with necessary protocols to be followed while treating such patients in the future.

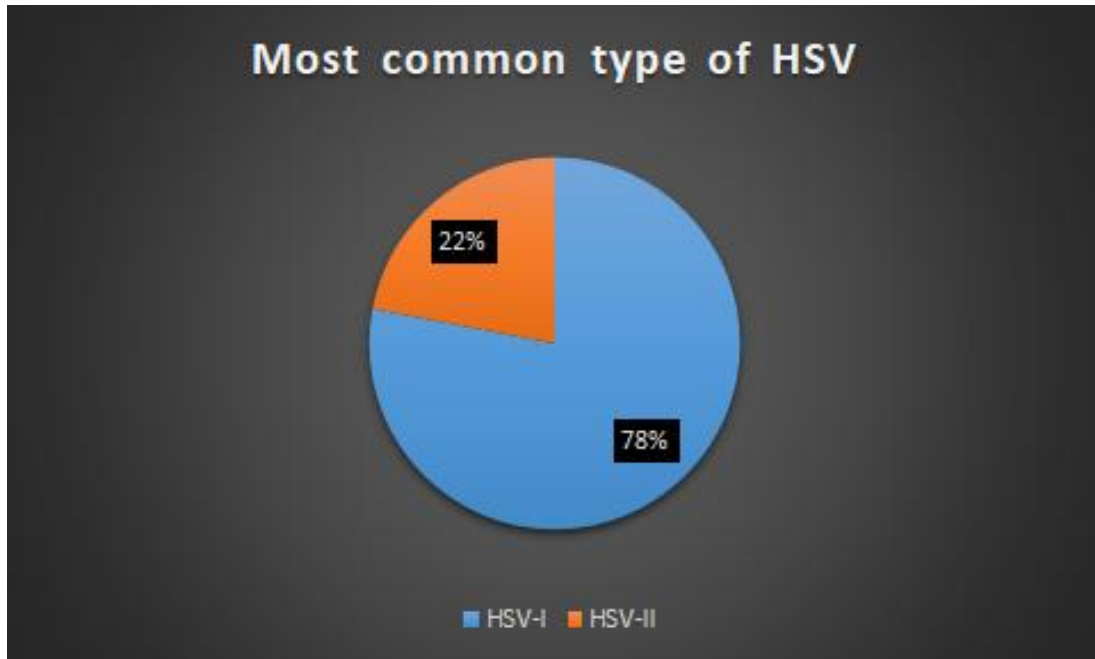


Fig. 1. Pie chart representing knowledge among dentists regarding the common types of HSV. HSV-I (Blue) was more common than HSV-II (Orange) among dental practitioners

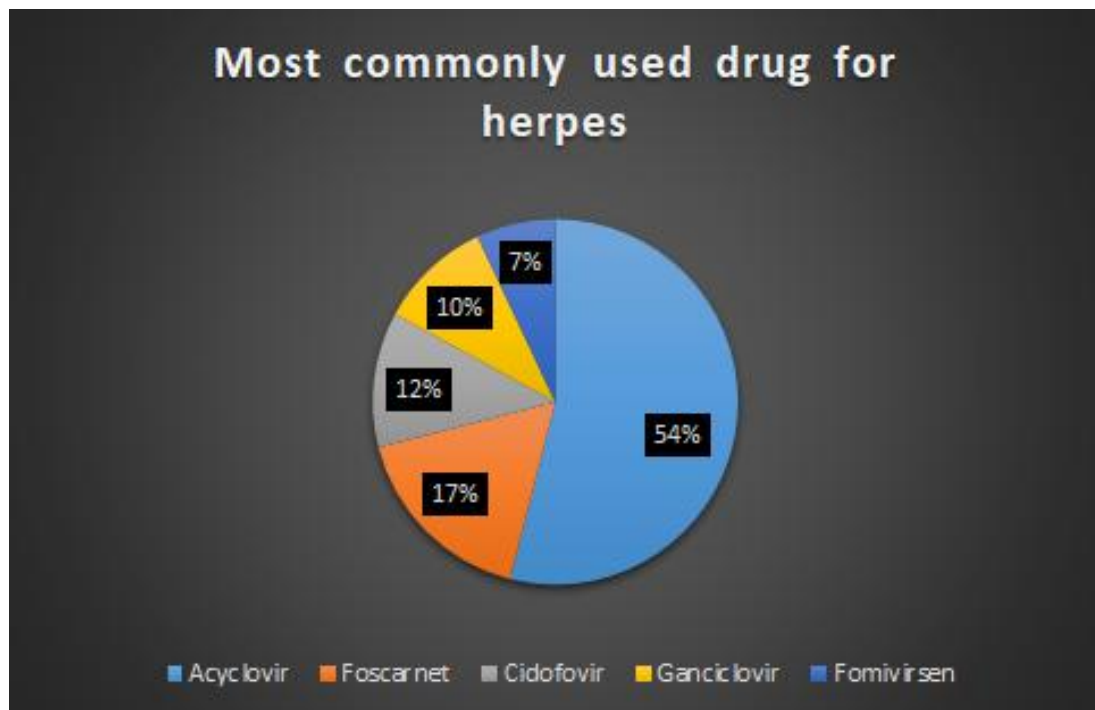


Fig. 2. Pie chart representing knowledge among dentists regarding the most common drug used for the treatment of herpes. Acyclovir (Blue) was the most commonly used drug for herpes compared to other drugs among dental practitioners

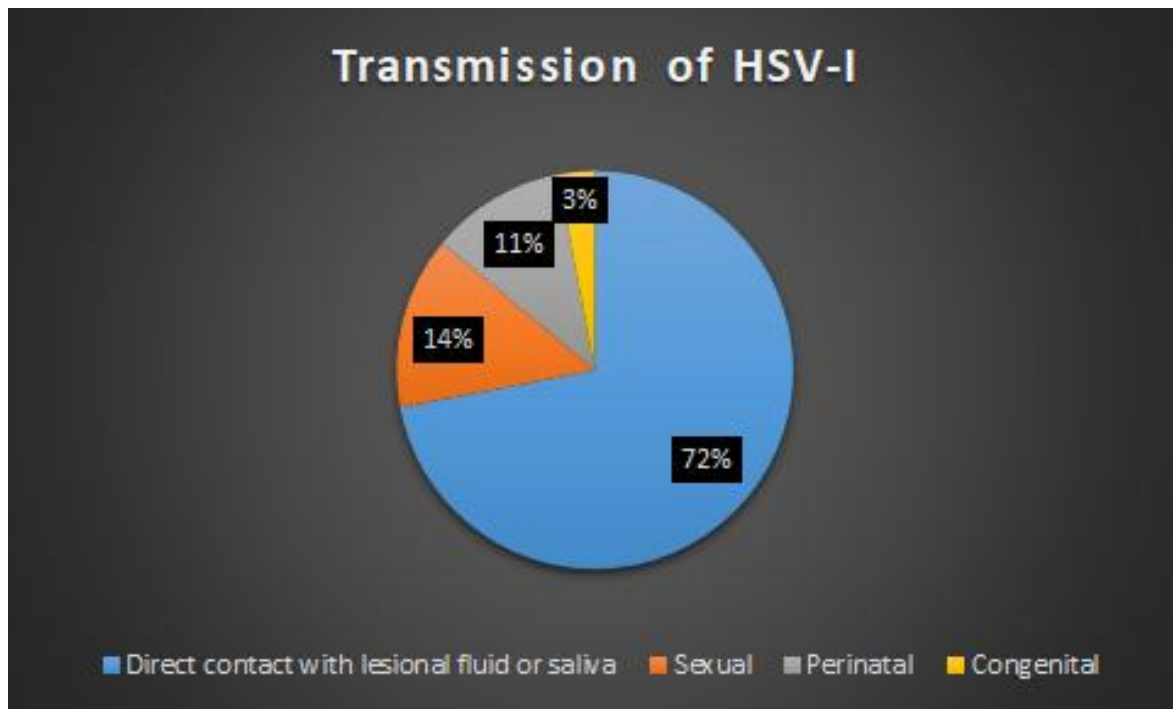


Fig. 3. Pie chart representing knowledge among dentists regarding the mode of transmission of HSV-I. Direct contact with lesional fluid or saliva (Blue) was the most common method of transmission of HSV-I compared to other methods

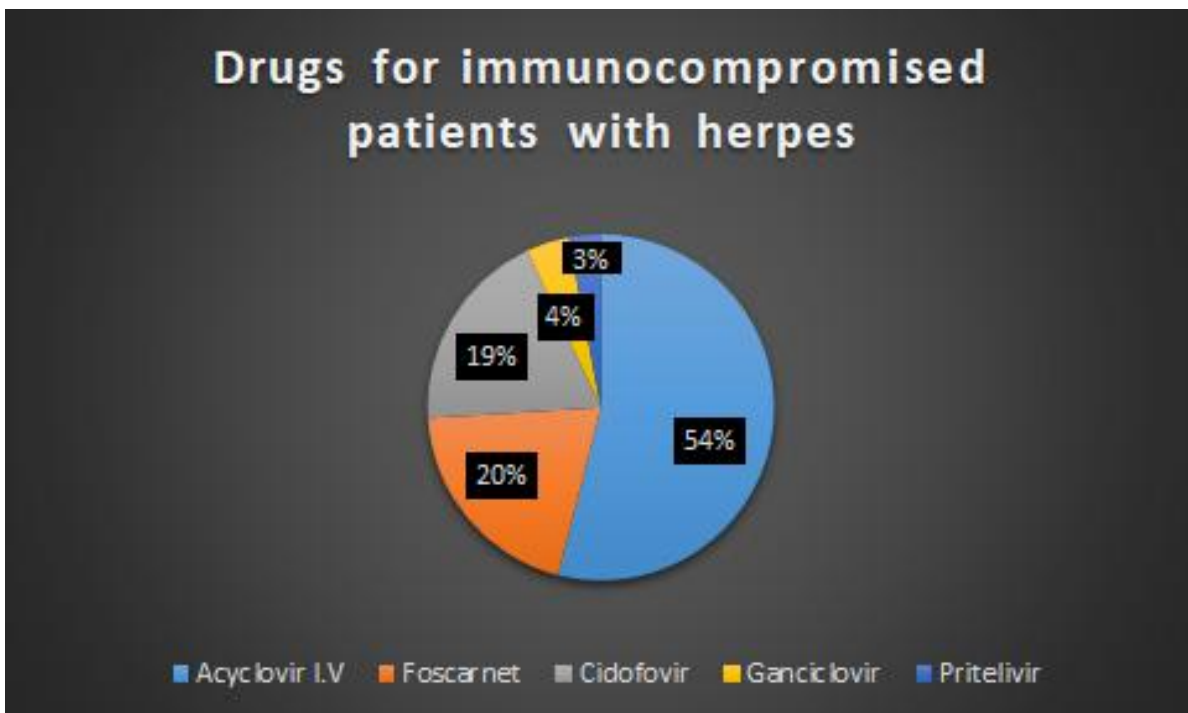


Fig. 4. Pie chart representing knowledge among dentists regarding the drugs used for testing herpes in immunocompromised patients. 54% of dentists agreed that acyclovir given in IV form can be effective in immunocompromised patients with herpes

Table 1. Responses of the practitioners to the questionnaire

Questions	Maximum response	Minimum response
1. Do you think that herpes can be cured permanently?	Yes- 76%	No- 24%
2. Which type of herpes is more common?	HSV I-78%	HSV II-22%
3. Are you aware that turmeric extract can decrease infection produced by herpes?	Yes-76%	No-24%
4. Which is the most commonly used drug against herpes?	Acyclovir-54%	Fomivirsen-7%
5. Are you aware of the dosage of drugs which are specifically targeted against herpes?	Yes-64%	No-36%
6. How HSV-I gets transmitted?	Direct contact with lesional fluid or saliva-72%	Congenital-3%
7. Does acyclovir reduce the transmission of virus or it inhibits the replication process?	Yes-73%	No-27%
8. Are you aware of the new generation antivirals like helicase primase inhibitors in treating herpetic infections?	Yes-62%	No-38%
9. Do you think that passive immunization from serum/globulin from immune persons helps to prevent herpes?	Yes-75%	No-25%
10. Which drug can be used in immunocompromised patients with herpes?	Acyclovir I.V-59%	Pritelivir-6%

4. CONCLUSION

Within the limitations of the present study, it can be concluded that proper awareness should be created among dentists for treating patients in their clinical practice. From this survey, it can be concluded that the majority of dental practitioners were aware of oral herpetic infections. It is necessary to follow proper precautionary measures in handling the patient with infectious diseases in order to prevent the spread of the disease and hence allowing early diagnosis and prompt management.

CONSENT AND ETHICAL APPROVAL

As per university standard guideline, participant consent and ethical approval have been collected and preserved by the authors

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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