

**DENTINO**  
**JURNAL KEDOKTERAN GIGI**  
**Vol VII. No 1. March 2022**

**OUTDOOR ACTIVITIES MODIFICATION AND RECURRENT INTRAORAL  
 HERPES IN ELDERLY PATIENT: CASE REPORT**

**Adi Ahmad Yusuf<sup>1)</sup>, Wahyu Hidayat<sup>2)</sup>**

<sup>1)</sup>Oral Medicine Specialist Program, Faculty of Dentistry, Padjadjaran University, Indonesia

<sup>2)</sup>Department of Oral Medicine, Faculty of Dentistry, Padjadjaran University, Indonesia

**ABSTRACT**

**Background:** Infections caused by the herpes simplex virus (HSV) are infections that often occur in the oral and perioral areas. One of the recurrent herpes infections in the orofacial area is recurrent intraoral herpes (RIH).

**Purpose:** To discuss treatment management of RIH and lifestyle modification in physically active elderly patients.

**Case Report:** A 67 year old male patient came to Oral Medicine clinic of RSGM Unpad with complaint of recurrent ulcers in the oral cavity, this ulcers started 3 days earlier and no history of fever. Patient daily activities including walking 8 to 9 km a day. Laboratory examinations showed an increase value of IgG HSV-1. Intraoral examination, multiple ulcers were found on the left lateral tongue, ventral tongue, upper labial mucosa, right labial mucosa and left buccal mucosa. **Case Management:** The patient was given acyclovir 200 mg, 5 times a day for 1 week. After one week, there was no improvement, new ulcers still appeared, we suggest that this is due to the patient still active as usual. Patient was given acyclovir 400 mg 5 times a day for 1 week, multivitamins and chlorhexidine digluconate 0,12% mouthwash, the patient was also instructed to reduce the frequency of outdoor activity and use sunscreen. On the third visit, patient was comfortable, the ulcers had healed and there were no new lesions. **Conclusion:** In addition to systemic medical treatment management for RIH, it is also necessary to consider lifestyle modifications in these patients by reducing the intensity of physical activity and use sunscreen.

**Keywords :** Elderly, HSV-1, lifestyle modification, recurrent intraoral herpes.

**Correspondence :** Adi Ahmad Yusuf; Oral Medicine Specialist Program, Faculty of Dentistry, Universitas Padjadjaran, Jl. Sekeloa Selatan No. 1, Bandung, Indonesia; Email: adi19001@mail.unpad.ac.id

**INTRODUCTION**

The herpes simplex virus is part of the alphaherpesvirus subgroup of the Herpesviridae. This virus is a family of double-stranded DNA viruses that are commonly found in animals and humans.<sup>1,2</sup> Herpesviridae viruses that are known to be pathogenic in humans include Herpes simplex virus 1 (also known as HHV-1/Human Herpes Virus 1), Herpes simplex virus 2 (HHV-2), Varicella zoster virus (HHV-3), Epstein Barr virus (HHV-5), HHV-6, HHV-7 and HHV-8.<sup>3</sup>

Data from WHO states that the Herpesviridae family has infected 90% of the world's human population.<sup>4,5</sup> While in Asia, 50% of children and 75% of adults have been infected with the HSV-1 virus. Seroprevalence increases with age, with most infections occurring in childhood. 60% higher seroprevalence at age 40 years compared to age < 20 years.<sup>6</sup>

Infections caused by the herpes simplex virus are infections that are often found in the orofacial area. Herpes simplex virus type 1 is probably a strain

of the herpes virus known to infect the area above the waist.<sup>7</sup> HSV infection lasts a lifetime, starting from primary infection which can be followed by clinical symptoms or without clinical symptoms. This virus usually causes a latent infection of neurons in the peripheral nervous system.<sup>1</sup> This virus resides in the host cell with minimal viral gene expression and avoids the host immune response but has the ability to reactivate and produce new viruses that can cause disease. Reactivation of the virus in sensory ganglia causes cutaneous and mucocutaneous manifestations in recurrent herpes.<sup>8</sup>

Primary HSV-1 infection usually occurs in childhood, which is known as primary herpetic gingivostomatitis. HSV-1 can reactivate after being latent for some time. This reactivation can be stimulated by several factors, namely stress, menstruation, hormones, fever, ultraviolet radiation, trauma and immunosuppression. HSV-1 reactivation lesions include herpes labialis, intraoral ulceration, herpes associated erythema multiforme (HAEM) and recurrent intraoral herpes.<sup>9</sup>

HSV-1 infection is closely related to a person's immune system. Starting from the sixth decade of life, the immune system undergoes a dramatic decline that continues in the stage of immune aging (immunosenescence). Therefore, elderly patients are more susceptible to reactivation of herpes simplex virus infection.<sup>10</sup>

This article discusses the recurrence of intraoral herpes in elderly patients with high outdoor activities. This case report aims to demonstrate another approach in the treatment of recurrent intraoral herpes with outdoor activity modification.

## CASE REPORT

A 67-year-old man came to the oral medicine clinic of RSGM Unpad with complaints of recurrent ulcers on his cheeks, lips and tongue. Complaints of ulcers are not preceded by fever. This ulcers has often happened before since about 5 years ago. Patients usually go to a general practitioner and are given medicine in the form of an ointment, but the patient forgot the brand or type of ointment. The patient denied history of systemic disease and there was no food or drug allergy.



**Figure 1.** Ulcer lesions on the left lateral tongue (a), ventral tongue (b), right (c) and left buccal mucosa (d) and upper labial (e)

Intra-oral examination found several lesions including ulcers on the left lateral tongue, ventral tongue, left and right buccal mucosa and upper labial mucosa (Fig. 1). From this initial examination, the symptoms and clinical features suggest Suspect aphthous like ulcer with differential diagnosis of recurrent intraoral herpes. At this first visit, the patient was instructed to gargle with Sanorine® 3 times a day, take Theragran® vitamin once a day and rinse the mouth with prednisone 2 times a day. The patient was also consulted for a complete haematological examination, IgG HSV 1, IgG HSV 2 and total IgE. Patients are also given education about possible diseases that he is experiencing and are advised to consume foods that are high in protein, vegetables, fruits and avoid spicy and oily foods.

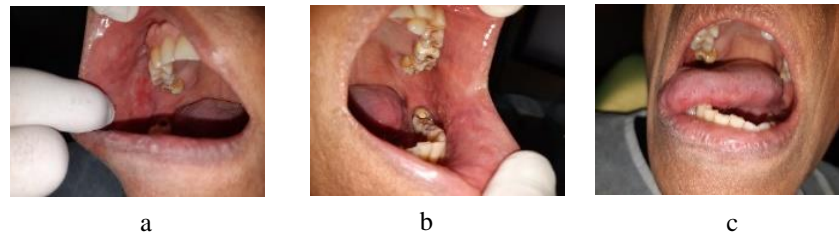
One week after the first visit the patient still complained of a new mouth ulcer. On intra-oral examination, ulcerated lesions were found on the left lateral tongue, upper labial mucosa, lower labial mucosa, and right and left buccal mucosa (Figure 2). The results of the laboratory examination showed an increase in the titer of IgG HSV-1 which was reactive with a value of 4.61 U/ml. Thus, it was confirmed that the patient was diagnosed with recurrent intraoral herpes. The patient was given 200 mg of acyclovir and taken 5 times a day for one week. Patients are also instructed to reduce the intensity of the frequency of outdoor sports activities.



**Figure 2.** Ulcer lesions on the left lateral tongue (a), upper labial mucosa (b), lower labial mucosa (c), left buccal mucosa (d) and right (e)

At the next visit, the patient still complained of new ulcers appeared, this time on the right cheek and lower left tongue. Intra-oral examination revealed ulcers on the right and left buccal mucosa as well as on the left side of the tongue (Fig. 3). At this visit the

patient was given acyclovir 400 mg 5 times a day and given for one week, Surbex Z® vitamin supplements once a day. Patients are also instructed to reduce outdoor sports activities and use sunscreen.



**Figure 3.** Ulcer lesions on right buccal mucosa (a), left buccal mucosa (b), and left lateral tongue (c)

At the next visit one week later, the patient was no longer complaining of new ulcers. Intra-oral

examination revealed healing throughout the oral cavity (Fig. 4)



**Figure 4.** Healing in the oral cavity

## DISCUSSION

Primary HSV-1 infection begins with contact with the virus, which is obtained by inoculation of the mucosa, skin and eyes with infected secretions.<sup>3,11</sup> The HSV-1 life cycle begins with the attachment of the virion and penetrates the cell wall of the mucosal epithelium to the nucleus. The attachment process involves glycoproteins B (gB) and C (gC) on the virus interacting with heparan sulfate proteoglycans (HSPGs). During the process of cell movement (motile), there is an elongation of the HSPGs-rich actin filaments called filopodia. The HSV-1 virus travels (surfs) along the filopodia during the attachment process. Immediately after that, gene expression occurs: immediate early, early, and late, then DNA replication, nucleocapsid assembly, capsid maturation, envelope formation, then the new virus will be released (shedding) in saliva and settle on sensory nerves in the trigeminal ganglion.<sup>12-14</sup>

Transmission of HSV depends on close contact between susceptible individuals and those who transmit the virus. For infection to occur, the virus must come into direct contact with a mucosal or skin surface. After the virus replicates at the site of entry, intact virions or their nucleocapsids are transported by retrograde axonal flow to the autonomic ganglia, where virus is latent in these ganglia. Recurrence will occur when the virus is reactivation and will be

carried by anterograde axonal flow back to the site where the primary infection occurred. The process of reactivation of the latent phase is stimulated by local stimuli, such as injury to neural tissue that harbors latent HSV virus, or by systemic factors such as physical or emotional stress, fever, exposure to ultraviolet light, menstruation and hormonal imbalances.<sup>3,13,15</sup>

The patient in this case report experienced reactivation of the HSV-1 virus due to high outdoor activities. The patient is known to exercise by walking 8 to 9 km every day. This allows high ultraviolet exposure that can lead to reactivation of the HSV-1 virus. There are two possibilities for UV exposure to affect HSV. The first is depression of the immune response due to UV exposure. UV radiation has been shown to suppress HSV antigen presentation to epidermal cells and cause decreased release of type I cytokines, an important part of immunological control for viruses such as HSV. This localized immunosuppression can cause viral replication to occur and may lead to recurrence. A second possibility where UV affects recurrence is through reactivation of HSV. Cell repair, via the transcription factors c-Jun and c-Fos, activates the HSV promoter transcription, leading to HSV transcription and reactivation. In addition, this repair pathway circumvents the latent activity of HSV,

which prevents infected neurons from undergoing apoptosis and then reactivation of HSV.<sup>16</sup>

The patient's advanced age also caused the healing of recurrent intraoral herpes in this case to be slow. It is known that at the age of 60 years, a person experiences a decrease in the immune system to the stage of immune system aging (immunosenescence).<sup>10</sup> It is very important to immediately treat HSV-1 infection in elderly patients, this is because HSV-1 infection in elderly patients can be associated with Alzheimer's disease where HSV-1 latent in the trigeminal ganglia can reactivate and ascend along the nerve pathways into the limbic system, and areas of the brain infected in Alzheimer's disease.<sup>17,18</sup>

The mainstay of treatment for recurrent intraoral herpes in this patient is acyclovir. Acyclovir is known to be able to enter and leave cells but is in an inactive state. In HSV-infected cells, the enzyme thymidine kinase from HSV can phosphorylate acyclovir to acyclovir monophosphate (ACV-MP), ACV-MP is trapped in infected cells, then cellular kinase converts ACV-MP to acyclovir diphosphate (ACV-DP) and acyclovir triphosphate (ACV-TP). ACV-TP is the active part of acyclovir which can inhibit HSV DNA replication so that HSV cannot replicate.<sup>1</sup>

Multivitamin (Surbex Z® and Theragran®) was given to this patient to increase the immune system response to pathogen. Multivitamin also helps physical and biochemical barriers, innate immunity, discourage microbial growth, helps regulate natural killer cells and phagocytes, support inflammatory response, adaptive immunity, cell mediated immunity and also antigen recognition.<sup>19</sup> All of these multivitamin function helps recovery in recurrent intraoral herpes in this patient.

In this case report patient, conventional recurrent intraoral herpes therapy has not been able to show maximum results. The dose of acyclovir should be increased and outdoor activities should be modified by reducing the hours of activity and instructing to wear sunscreen when outdoor activities. Sunscreen provides physical barriers that reflect and scatter light and chemical barriers that absorb light which help to limit skin damage by disturbing the photochemical cascade that occurs with UV sunlight thus prevent recurrent intraoral herpes by minimizing UV exposure.<sup>20</sup>

Treatment of recurrent intraoral herpes in elderly patients who have high outdoor activities is not sufficient with systemic therapy but also requires good cooperation with the patient. By modifying outdoor activities, namely reducing the intensity of outdoor activities and always using sunscreen, it can greatly help cure recurrent intraoral herpes in this patients.

## ACKNOWLEDGEMENT

The authors would like to thank the patient and his family for agreeing to be a part of this case report.

## CONFLICT OF INTEREST

None to be declared

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