

Effect of bedtime on recurrent aphthous stomatitis in college students



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Objective. In this study, we conducted a questionnaire-based survey at Sichuan University to investigate the potential effects of bedtime on recurrent aphthous stomatitis (RAS).

Study Design. An anonymous self-designed questionnaire was adopted to investigate the association between bedtime and RAS in college students at Sichuan University. Statistical analyses were used to identify risk factors for RAS and to explore the relationship between bedtime and RAS.

Results. One thousand six students were investigated. High frequency of colds (odds ratio [OR] 2.17; 95% confidence interval [CI] 1.52-3.10; $P < .001$) and bedtime after 11 p.m. (OR 16.55; 95% CI 6.49-42.16; $P < .001$) were independent risk factors for RAS recurrence, but family history, stress, bad relationships with roommates, and gastrointestinal disease were not. Moreover, increased frequency of bedtime after 11 p.m. ($\tau > 0$; $P < .05$), as well as longer cumulative time from 11 p.m. to bedtime ($R > 0$; $P < .05$), was correlated with increased severity of ulcers.

Conclusion. Bedtime after 11 p.m. not only served as an independent risk factor but both its frequency and cumulative time were also associated with severity of RAS in college students. (Oral Surg Oral Med Oral Pathol Oral Radiol 2015;119:196-201)

Recurrent aphthous stomatitis (RAS), or canker sores, is a common oral mucosal disease, occurring more frequently in children and young people, with an average incidence between 20% and 60% over a lifetime reported in all people.^{1,2} RAS often starts in the second decade of life and peaks in the third decade.²⁻⁶ There are many variations in clinical patterns, such as the frequency, duration, and number and size of painful lesions, which typically present as round or ovoid ulcers with circumscribed margins, erythematous haloes, and yellow or gray floors.^{1,2} Pain is the major clinical symptom of RAS and often affects the patient's quality of life and causes emotional stress.^{1,2} Although trauma, stress, microorganisms, family history, food hypersensitivity, immune dysregulation, hormonal factors, and a

genetic predisposition have been proposed as potential causative factors, the etiology of RAS is unknown.^{7,8}

Due to the stress caused by studying, increased use of the Internet, and less health care knowledge, late bedtimes seem to be a featured routine in teenagers. It is reported that sleep disorder is linked to immune-related diseases and mental disorders,⁹⁻¹³ and people with mental illness or with a higher incidence of immune damage are susceptible to RAS.^{7,8,14,15} In addition, two studies examined the direct effects of late bedtime on RAS.^{16,17} To investigate the potential impact of bedtime on RAS, we conducted a retrospective survey with questionnaires among 1006 college students at Sichuan University between June 2013 and October 2013. For the specific purpose of testing the correlation between bedtime and RAS, the questionnaire included mainly bedtime and severity of RAS. The purpose of this study was to examine the hypothesis that a late bedtime would increase the risk and severity of RAS and to encourage further study of the etiology and preventive measures against RAS.

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PATIENTS AND METHODS

Patients

Our study was approved by the Ethics Committee of Sichuan University. Fifty students were randomly selected to complete a presurvey, and written informed consents, which were obtained before the start of the

Statement of Clinical Relevance

The etiology of recurrent aphthous stomatitis (RAS) is unknown. This study investigated the potential effect of bedtime on RAS in college students and found that late bedtime increased the risk of RAS.

study, revealed that 48% of these students had experienced RAS. According to the estimation method used in preventive dentistry, we determined a sample size of approximately 1000 people:

$$N = K \times Q / P^1$$

in which N is the sample size; P is the prevalence rate in the presurvey; $Q = 1 - P$; and K is determined by permissible error. Based on this estimation, a random sample of 1010 college students was selected to complete the survey at Sichuan University. Copies of the questionnaire were distributed, and a total of 1006 college students responded to the questionnaire, for a response rate of 99.6%.

self-limitedness,^{1,2} to distinguish RAS from other common ulcers, such as traumatic ulcers. The frequency, quantity, size, and duration were the quantitative indices with regard to the severity of RAS.

“Bedtime” was defined as the time at which the respondent fell asleep. In this survey, “short-term bedtime after 11 p.m.” referred to students who had bedtimes after 11 p.m. only during the examination period, and “long-term bedtime after 11 p.m.” referred to students who had bedtimes after 11 p.m. during examination and non-examination periods. The cumulative time from 11 p.m. to bedtime per week during non-examination periods was calculated by using the following formula:

$$\begin{aligned} \text{Cumulative time} = & \text{seven} \times \text{time from 11 p.m. to usual bedtime} + \text{special days} \\ & \times \text{time from usual bedtime to special bedtime} \end{aligned}$$

Questionnaire

In consideration of a range of bedtimes, other potential causative factors, and quantitative indices with regard to the severity of RAS, we designed the questionnaire to investigate the relationship between late bedtime and RAS. After the presurvey, we took the patients’ suggestions into consideration and modified some options in the questionnaire cautiously.

To protect the privacy of the students and to obtain the most frank responses, to the extent possible, we used an anonymous questionnaire. The anonymous self-designed questionnaires collected the following data: (1) gender and grades, (2) type of profession, (3) usual bedtime, (4) bedtime on special days, (5) frequency of “4”, (6) bedtime during examination periods, (7) digestive system conditions, (8) annual frequency of colds, (9) family history of RAS, (10) stress on normal days, (11) relationship with roommates, (12) frequency of RAS during the non-examination periods, (13) frequency of RAS during examination periods, (14) the usual number of RAS occurrences, (15) the largest size of RAS, (16) treatment for RAS, and (17) duration of the lesions. To collect data more efficiently, the questionnaire was divided into two portions. The patients completed one or both portions based on whether they experienced RAS or not.

Definitions

The questionnaires reflected the clinical characteristics of RAS, such as recurrence, periodicity, and

Survey method

The retrospective investigation was completed by students of Oral Medicine, who were mentored by teachers with specializations in oral mucosa. The presurvey (pilot investigation) was conducted first, with the intention of perfecting the questionnaires, determining the sample size, and developing a survey plan.

A total random sample of 1010 college students was selected to complete the survey at Sichuan University. The questionnaires were issued to the students in study rooms and the library, who came from different majors and grades. Considering the different majors of the participants and the uneven levels of understanding about RAS, the oral medicine students in charge of the survey explained the purpose of the study to the other students and provided access to information about the diagnostic criteria, causes, and prevention of RAS before the survey. The completed questionnaires were then collected.

The following data were extracted for statistical analysis: demographic information, such as gender, grade, and professional factors; RAU severity, including ulcer size, number, duration, and frequency during examination or non-examination periods; and some factors closely associated with physical condition, such as frequency of colds, stress, family history, gastrointestinal conditions, and bedtime. To ensure the accuracy of the data, items were checked several times during the input process. We used SPSS software for the statistical analysis and to devise the final report.

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