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Effect of clove cigarettes on blood clotting time in post-tooth extraction patients

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Abstract

Background: Cigarettes are one of the processed tobacco. Clove cigarettes are cigarettes that are more consumed than other types of cigarettes. Smoking can cause the appearance of free radicals. Free radicals can interfere with the process of hemostasis, so it will interfere with the process of stopping bleeding if blood vessels are damaged. Tooth extraction is the procedure of removing a tooth from its socket. The duration of wound healing after tooth extraction can be influenced by several factors. One habit that can inhibit the wound healing process is smoking.

Purpose: This paper aims to provide information about the effect of smoking on blood clotting time in patients after tooth extraction. Methods: This article review is done by searching for journals with keywords "clove cigarettes, blood clots, clotting time, post-tooth extraction" through PubMed, PMC free article, and Google Scholar search sites.

Results: Smoking is one factor that can increase plasma hemosistein levels. Increased hemosistein can prolong blood clotting time. In addition, smoking for years can also cause hardening of the arteries, which is caused by the accumulation of fat in the blood vessels due to nicotine contained in cigarettes.

Conclusion: In post-tooth extraction patients, smoking can cause a longer blood clotting time so that wound healing in the tooth socket after tooth extraction can be inhibited

Keywords: Clove cigarettes; Blood clots; Clotting time; Post-tooth extraction

1. Introduction

Cigarettes are one of the processed tobacco. There are three types of cigarettes, namely clove cigarettes, white cigarettes, and klembak cigarettes. Among the types of cigarettes, clove cigarettes are the most popular [1]. In 1 cigarette, there is 4000 chemical compounds, 400 hazardous substances and 43 carcinogenic substances. The chemical compounds contained in a cigarette include nicotine, acetone, naphthylamine, methanol, pyrene, dimethylnitrosamine, naphthalene, cadmium, carbon monoxide, benzopyrene, vinyl chloride, hydrogen cyanide, toluidine, ammonia, urethane, toluene, arsenic, dibenzacridine, phenol, butane, polonium-210, tar [2].

Smoking is one of the unhealthy behaviors that is very easy to find in Indonesia. There are factors that influence a person to smoke, consisting of external (social) and internal (psychological) factors. The biggest factor of smoking is social or environmental factors. A person's character can be shaped by the family environment, neighbors and friends [3]. The number of smokers has never decreased and has shown an increase even though it is proven that these cigarettes can harm users. This is because people consider smoking behavior a natural habit [4].

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Based on WHO data in 2020, the prevalence of smokers in Indonesia is one of the highest in the world, at 62.9%. There are two-thirds of children in Indonesia who are exposed to secondhand smoke at home. This can contribute to stunting and hinder the development and growth of children [5]. Other effects of tobacco smoking include severe cardiovascular leading to endothelial dysfunction, increased oxidative stress, and increased cardiovascular morbidity and mortality [6].

Cigarette smoke consists of various oxidants and free radicals that can damage lipids, proteins, deoxyribo-nucleic acid (DNA), carbohydrates and various other biomolecules. In research in recent years, it has been suggested that smoking can also affect blood components. Carbon monoxide contained in cigarettes has a great affinity for hemoglobin, making it easier for the two to bind together to form carboxyhemoglobin, an inactive form of hemoglobin. This results in hemoglobin not being able to bind oxygen to be released to various tissues, causing tissue hypoxia [7]. If the blood vessels are damaged, then later the blood will clot. Blood clotting time is the time blood clotting is calculated from the time the blood comes out of the vein until a clot occurs under specific conditions. Blood clotting time will lengthen when there is severe deficiency of clotting factors in the intrinsic pathway and joint pathway, in patients with liver disease, blood clotting factor deficiency, leukemia, congestive heart failure. While blood clotting time will shorten in patients with myocardial infarction (heart attack), pulmonary embolism (lung disease), the use of birth control pills, vitamin K, digitalis (heart drugs), and users of diuretic drugs (drugs to remove water, for example if there is swelling) [8].

In addition to smoking, there are other factors or habits that can cause a person to experience blood clotting disorders after tooth extraction. These factors or habits include age, hormonal, stress, nutrition, obesity, systemic diseases, drug consumption, alcohol [9]. In addition, a study says that there is a significant difference in blood clotting time after tooth extraction between menopausal patients and patients who have not been menopausal in The Dental and Oral Hospital of Sam Ratulangi University. The length of blood clotting time after tooth extraction in menopausal patients is longer than patients who have not experienced menopause because in menopausal patients there is a decrease in levels of estrogen, progesterone, and calcium hormones, all three of which affect blood clotting [10].

With all the harmful effects of smoking, smoking behavior must be stopped. However, of course, stopping smoking behavior is not an easy effort. In addition to using therapy, there are also those who quit smoking independently. In an effort to stop smoking, smokers must have good self-efficacy to control new behaviors they have done, namely quitting smoking [11]. In achieving this, it is not easy, it takes a strong intention and commitment and support from the surrounding environment [12].

Tooth extraction is the procedure of removing a tooth from its socket. Tooth extraction is said to be ideal if the implementation is not accompanied by pain, trauma that occurs in the tissue around the tooth is minimal, the extraction wound can heal normally and does not cause post-extraction problems [13]. The duration of wound healing after tooth extraction can be influenced by several factors. Complications and bad habits can inhibit the acceleration of wound healing after tooth extraction. One habit that can inhibit the wound healing process is smoking. Therefore, this paper aims to provide information about the effect of smoking on blood clotting time in patients after tooth extraction.

2. Material and methods

The research design used was a descriptive literature review, where the data obtained did not come directly from direct supervision but was obtained through previous research using databases such as Google Scholar, PMC free articles, and PubMed as well as various relevant sources. The keywords we chose in this article review are clove cigarretes, blood clotting, clotting time, and post-tooth extraction.

3. Results and discussion

Hemostasis of the tooth extraction socket begins with the constriction of the blood vessels and the formation of a platelet plug that blocks the ends of the ruptured blood vessels. However, 20 to 60 minutes after tooth extraction, the clot retracts, causing the edges of the ruptured blood vessels to be pulled together, thus contributing to the final state of hemostasis. Because the severed blood vessels lining the tooth extraction socket are not very large, within 10 minutes, which is the normal clotting time, the entire hole of the ruptured blood vessel ends will be filled with clotted blood [14].

Kewo, L. A., et al [15], in their article entitled Differences in Post Tooth Extraction Wound Healing between Smokers and Non-Smokers at The Dental and Oral Hospital of Sam Ratulangi University conducted a study with a total of 32 respondents, consisting of 16 smokers and 16 non-smokers. This research was conducted by looking at the clinical signs

of inflammation, namely rubor, calor, dolor, tumor, and functio laesa which should have been absent at the time of observation (7th day after extraction). Based on the study, sockets where there were no clinical signs of inflammation were found in 11 non-smokers (34.4%) and in 3 smokers (9.4%). On the other hand, for the socket there were still signs of inflammation found in 13 smokers (40.6%) and 5 non-smokers (15.6%). So, the researchers concluded that there were significant differences in post-tooth extraction wound healing between smokers and non-smokers at The Dental and Oral Hospital of Sam Ratulangi University.

In addition, Swari, A.A.D.P [16] also conducted research entitled The Effects of Smoking on Blood Clotting Time in Berawantangi Taman Banjar, Jembrana Regency, conducted research with a total of 60 respondents, including 30 male respondents who were active smokers and 30 male respondents who are passive smokers. He concluded that the number of samples with the longest blood clotting time was found in the sample group of active smokers with a total sample of 16 people (53%). The sample group that had the most normal blood clotting time was in the passive smoking group with 29 people (97%). Based on the results of these studies, it was found that there was an effect of smoking on blood clotting time.

Whereas in a research article conducted by Sanari, A.A., et al [17] entitled Effects of Smoking on Postoperative Complications Reported by Patients After Minor Oral Surgery Procedures, 85 patients participated. The study found that smokers experienced more bleeding incidents. It has also been proven that smokers experience more pain, facial swelling, and postoperative infections.

Smoking is one factor that can increase plasma hemosistein levels. Increased hemosistein can prolong blood clotting time. Hemosistein is an intermediate compound formed in the metabolism of methionine, an essential amino acid found in various forms in plasma. Hemosistein affects several factors involved in the blood clotting cascade, such as reducing antithrombin activity. Smoking for years causes hardening of the arteries, which is caused by the accumulation of fat in the blood vessels due to nicotine contained in cigarettes. Passive smokers who are inadvertently exposed to or inhale secondhand smoke from others and are in the same environment or adjacent to active smokers are also at risk of increased blood clotting time. Smoking is a bad habit that can interfere with blood clotting time. In post-tooth extraction patients, smoking can cause a longer blood clotting time so that wound healing in the tooth socket after tooth extraction can be inhibited [16].

4. Conclusion

Smoking is a bad habit that many Indonesians do. Clove cigarettes are the most commonly used cigarettes. The harmful content in clove cigarettes can cause several side effects, one of which is blood clotting disorders. In patients after tooth extraction, smoking is proven to cause a longer blood clotting time that can inhibit the wound healing process in the tooth socket after tooth extraction.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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