PREVENTION AND TREATMENT EPISTAXIS WITH BIOFLAVANOID: A REVIEW

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ABSTRACT

Epistaxis is a spontaneous bleeding from the inside of the nose. Epistaxis can occur in all ages especially in children and the elderly. Epistaxis is estimated to 60% of the population who had at least one episode of lifetime and only 6% sought medical help. Epistaxis is very common and is found by many doctors including Ear Nose Throat doctors, family doctors, and other specialists. Epistaxis is caused by the loss of the nasal mucous membrane that contains many small blood vessels. Bleeding usually occurs when the mucosa is eroded and the vessels become open and then rupture. Mucosal loss will be accompanied by injury to the blood vessels that can cause bleeding. Complementary medicine may also be given to patients with epistaxis. Traditional Chinese medicine has also performed acupressure and the use of diet / herbal medicines to treat epistaxis. One supplement that can help prevent and treat epistaxis is bioflavonoids. Bioflavonoids (or flavonoids) are plant substances that give color to many fruits and vegetables. This paper will discuss the benefits of herbal plant in treating epistaxis.

Keywords: Epistaxis, flavonoid, herbs

INTRODUCTION

Epistaxis is a spontaneous bleeding from the nose. Epistaxis can occur at any age, with a peak occurring in children and elderly (Abdelkader \textit{et al.}, 2007). Epistaxis is a very frequent event and is found by many doctors including Ear Nose Throat (ENT) doctors, family doctors, and other specialists (Benskey and Barokt 2000). Incidence of epistaxis is estimated >60% of population who have episaxis episodes for life and only 6% seek medical help. Incidence of epistaxis is generally the same between men and women, and the age distribution of epistaxis is usually <20 and > 40 years (Adam, 2007).

Nasal bleeding begins with a rupture of a blood vessel in the nasal mucous membrane. Epistaxis is caused by local causes, systemic causes, and idiopathic causes. Local trauma is the most common cause, followed by facial trauma, foreign bodies, nasal or sinus infections, and
inhaling dry air long time. Children usually present with epistaxis due to local irritation or upper respiratory tract infections (Brinjikji et al., 2003; Bunney, 1984). Epistaxis in the view of Chinese medicine is caused by many things. Epistaxis can occur due to heat in the blood, sinus infections, and weakness of the spleen tissue that makes a person deficient in bioflavonoids and causes the blood vessels to become brittle and susceptible to bleeding (Chen and Chen, 2005).

Bioflavonoids (or flavonoids) are plant substances that give color to many fruits and vegetables. Citrus fruits are a rich source of bioflavonoids, including disomin, hesperidin, and naringen. Those taking bioflavonoids experienced far more rapid improvement in symptoms and capillary strength than those who took a placebo (Douglas and Wormald, 2007). Betel leaves can hold the bloodstream, heal wounds on the skin, and stop bleeding. The function of betel leaf as disinfectant or germ killer, making this traditional medicinal plants can kill bacteria or germs contained in the nose. In addition to stopping the bleeding, it will reduce the nosed wound due to infection (Eziyi et al., 2009).

A. Definition of Epistaksis

Epistaxis is a spontaneous bleeding out of the nose. Epistaxis is a symptom that can occur at any age, with the most occurrence in children and the elderly (Abdelkader et al., 2007). Family physicians and ENT doctors often find epistaxis in daily clinical practice (Benskey and Barokt, 2000).

![Figure 1. Epistaxis (Benskey and Barokt, 2000).](image)

Epistaxis does not stand as a disease of its own, but rather as a symptom or a manifestation of another disease. Most epistaxis is mild and can stop without medical help, and sometimes severe, although rare. Epistaxis can be a problem that is fatal if it is not treated promptly (Eziyi et al., 2009). Some patients often experience recurrence (Brinjikji et al., 2003).
B. Epidemiology

The exact prevalence of epistaxis is unknown because most of the events can be resolved by the patient so that they are not reported. Epistaxis was noted when patients needed help from medical personnel due to severe and recurrent epistaxis (Jeved, 2008). As many as 60% of people experience at least one episode of episodes during their lifetime, only 6% of them come to health services to seek the help of health workers. The rate of epistaxis is similar in male and female patients, the age distribution of patients who come with epistaxis is at most <20 years old and> 40 years (Adam, 2007). Epistaxis spread based on age is bimodal, with peak in children (2-10 years old) and orang with advanced age (50-80 years). Epistaxis in infants who come without blood clotting / coagulopathy disorders or nose abnormalities is not much (Kucik and Timothy, 2005).

C. Etiology

Rupture of blood vessels in the nasal mucous membrane is the beginning of nasal consciousness/epistaxis. Epistaxis is caused by local causes (for example: trauma, mucosal irritations, septal abnormalities, inflammatory diseases, and tumors), systemic causes (eg arteriosclerosis, dyscrasias), and idiopathic causes. Local trauma is the most common cause, followed by facial trauma, foreign bodies, nasal or sinus infections, and inhaling long dry air. Epistaxis occurring in children is usually caused by local irritation or upper respiratory tract infections. Purkey et al. Suggested that an increased incidence of epistaxis was found in patients with allergic rhinitis, chronic sinusitis, hypertension, blood malignancy, coagulopathy, or congenital telangiectasia. An increase in epistaxis is also found with increasing age and colder weather (Brinjikji et al., 2003; Bunney, 1984).

1. Pathophysiology of Epistaxis

The loss of the nasal mucosa layer rich in small blood vessels is a major cause of epistaxis. The vessels become open and break when the mucosa is eroded. Bleeding is caused by loss of mucosa accompanied by injury to the blood vessels. One of the main causes of epistaxis is hypertension. Baroreceptors of hypertensive patients are usually no longer sensitive so they cannot lower blood pressure to normal because the baroreceptors have adapted or experienced a reset to work at a higher level. Baroreceps still function to regulate blood pressure in patients with a gradual increase in blood pressure, but also maintain at higher mean pressures (Maclean and Littleton, 2003).
Stress on the heart and blood vessels can occur when a person has hypertension. The heart will experience an increase in workload because it must pump blood against increased total peripheral resistance, blood vessels can be damaged as a result of an increase in internal pressure. The walls of the blood vessels will weaken due to the degenerative process of atherosclerosis, so it will speed up the process. Congestive heart failure is one of the complications of hypertension, congestive heart failure occurs due to the inability of the heart to pump blood against an increase in arteries, rupture of blood vessels in the brain will cause a stroke, or rupture of coronary vessels will cause heart disease. Spontaneous bleeding that occurs due to rupture of small blood vessels in other parts of the body can also occur, although it has a mild effect, such as epistaxis which is a result of rupture of blood vessels in the nose (Maclean and Littleton, 2003).

More than 90% of bleeding occurs anteriorly and arises from the Little area, where the Kiesselbach plexus is in the septum. The Kiesselbach plexus is a place where blood vessels gather from the ICA (anterior and posterior ethmoidal arteries) and ECA (sphenopalatine and branches of the internal maxillary artery) (Mallika and Shymala, 2007). Progressive changes in blood vessel muscle will be found in small and medium arterial examination in middle and advanced people. Changes caused by interstitial fibrosis vary from simple to complete change. The changes will show the failure of blood vessel contraction due to loss of muscle tunica media that can lead to long and heavy bleeding. Examination at the site of bleeding after epistaxis in younger patients will show a thin and fragile area. The fragile vascular wall is the result of local ischemia or trauma (Maclean and Littleton, 2003; Melia and Gerald, 2008).

![Figure 2. Location Valley of Harmony (Boeis Adam 2007).](image)

Epistaxis according to Chinese medicine's view is caused by many things. Epistaxis can occur due to heat in the blood, sinus infections, and weakness of the spleen tissue that makes a person become bioflavonoid deficient and causes blood vessels to become fragile and susceptible to bleeding. Anger, frustration, and other stressors can cause nosebleeds to the
vulnerable. Unhealthy diets can produce heat in the stomach, which manifests with gum inflammation and nosebleeds (Chen and Chen, 2005).

2. Management of Epistaxis with Herbal Medicine

Nasal compression and closing of the nostrils that have problems with gauze or cotton soaked in topical decongestants are preliminary treatment in epistaxis patients. Direct pressure is recommended continuously, at least 5-20 minutes. The patient's head is tilted forward to prevent blood from flowing into the posterior/back of the pharynx, the action being taken to prevent the patient from feeling nauseated and preventing the occurrence of airway obstruction. A study suggests that topical use of oxymetazoline sprays can stop as much as 65% of bleeding occurring in patients with epistaxis in IGD (Muchuwati, 2006).

Epistaxis management requires many types of intervention, from cautery, nasal tampon, maxillary artery ligation, anterior artery ligation, and sphenopalatina artery ligation (Benskey and Barokt, 2000). Complementary medicine may also be given to patients with epistaxis. Traditional Chinese medicine has also performed acupressure and the use of diet / herbal medicines to treat epistaxis (Chen and Chen, 2005).

Acupressure is performed by determining and locating acupressure points for nosebleeds between the right thumb and forefinger called Valley of Harmony (LI-4). A steady pressure is given with the left thumb until the patient feels sore and hold for 2 minutes, then repeat on the left hand. The second way is to find an acupressure point for a nosebleed in the middle of the upper forehead, two fingers-wide inside the front hairline called Upper Star (DU-23). The steady pressure is given with the index finger or middle finger until the patient feels pain and hold for 2 minutes (Muhammad et al., 2006).

![Figure 3. Location of the Upper Star (Boeis Adam 2007).](image)

Beta-carotene supplementation (800 mg) and vitamin A (200 IU) may support the body's ability to improve the immune system. Vitamin B complex, especially B6 (50 mg) can
support blood vessel health. Vitamin C (1,000 mg) and K (200 mg) can help increase clotting time and prevent excessive bleeding. Tea can help prevent nosebleeds (Muhammad et al., 2006; Nix, 2005). Nosebleeds associated with colds, respiratory infections, and sinusitis can be given mint leaves, and licorice which has traditionally been used frequently (Nurfazlina, 2010).

If there is a nosebleed the patient is advised to take a rest and stop all activities. The qi gong and tai chi regimens combined with cardiovascular exercise are helpful. Stress can increase episodes of nosebleeds so patients must be taught meditation to release stress. The patient must sit comfortably or lie on his back. Slow breathing inward and do abdominal breathing. Think and say the word "calm" every breath. Relaxing parts of the body and releasing tension with each breath. Diets are generally healthy and balanced with smaller and frequent meals as well as many complex carbohydrates and protein sources can be done (Muhammad et al., 2006; Nix, 2005).

Bananas, celery, sunflower seeds, yarrow flowers (tea), honey, soy products, green beans, bamboo shoots, seaweed, grains, and green vegetables such as spinach, broccoli and kale can be an option. Green dandelion, chrysanthemum and cassia seeds (tea), lotus root, and hawthorn (tea) are also good additions. Drink at least 8 cups of warm water or room temperature a day. Avoid excessive eating and oily, fried, baked, or spicy foods. Alcohol and coffee can cause dehydration so it can induce heat and cause a rise in energy to the head, and can potentially cause nosebleeds. Exposure to dry, dusty and cold air is regulated using a warm humidifier at home or office (Muhammad et al., 2006).

Herbal remedies and other natural supplements have become popular alternative medical therapies. Patients who use herbal products can also come to an ENT surgeon with epistaxis or with unexpected excessive perioperative bleeding (Purkey et al., 2014). A large number of patients who use complementary and alternative medicine mostly do not tell the doctor. This can affect safety because herbal medicines are considered to have a variety of side effects and can interact with conventional medicines so that it will have a potentially bad effect. Garlic can increase bleeding time and milk thistle alters the function of liver enzymes that will complicate the treatment of epistaxis (Schosser, 2009). Hydroxytoluene butylated which is a synthetic antioxidant can cause haemorrhagic toxicity. Four natural tocopherols have a tendency to cause bleeding in the order of α > β > γ > δ, and ubiquinone Q-10 and β-carotene also have relatively strong and weak hemorrhagic effects respectively associated with prothrombin and partial thromboplastin time index (Seidel et al., 2018).
3. Benefits of Herbal Plant Content on Epistaxis

Antioxidant activity and free radical methanol extract obtained from *cissus quadrangularis* showed strong antioxidants and free radicals in in vitro and in vivo experiments mainly due to the presence of beta carotene. The ester extract of 35E (95%) can accelerate the healing of epistaxis. Methanol extract showed significant antiulcer activity in ulcers made at the study using a mouse model by reducing gastric secretion and by increasing the levels of glycoprotein (Simon F 2008). Methanol extract produces a wound healing effect on gastric mucosal damage in rats through its antioxidant mechanism. Beta sitosterol contained in the methanol extract has an anti-lipid peroxidation effect and thus prevents tissue damage (Somova *et al.*, 2008).

Seven medicinal plants widely used in Zimbabwe are due to their high antioxidant and phenolic activity, among others: *Albizia amara, Elionurus muticus, Heteropyxis natalensis, Hoslundia opposita, Lippia javanica, Ocimum urticifolia* and *Warburgia salutaris*. Total phenolics in plant extracts are estimated to be equivalent to tannic acid (TAE), which indicates that the phenolic compounds and antioxidant activity contained in the above plants are very high (Traboulsi *et al.*, 2015). One supplement that can help prevent and treat epistaxis is the bioflavonoid contained in oranges. Bioflavonoids (or flavonoids) are plant substances that give color to many fruits and vegetables. Citrus fruits are a rich source of bioflavonoids, including disomin, hesperidin, and naringen. A double-blind study with a controlled placebo found that the combination of diosmin and hesperidin bioflavonoids reduced the symptoms of capillary fragility, such as nosebleeds and bruises. Those taking bioflavonoids experienced far more rapid improvement in symptoms and capillary strength than those who took a placebo (Douglas and Wormald, 2007).

The content of essential oils in betel leaves is composed by phenols and their derived compounds such as kavikol, kavibetol, karvacol, eugenol, and allilpyrocatechol. The betel leaf contains an astiri oil also contains carotene, thiamine, riboflavin, nicotinic acid, vitamin C, tannins, sugars, starch and amino acids. Betel leaf contains eugenol that can eradicate the fungus. Betel leaf empirically can stop bleeding from the nose or nosebleeds, the benefits of betel leaf can help close the broken blood vessels of the nose. Betel leaves are more effective because they have two functions. The first function of betel leaf is to ease the epistaxis mechanically and secondly by chemical means. The mechanical function of betel leaves is obtained from the pressure of the nasal blood vessels when the betel leaf roll is inserted into the nosebleed nostrils. Chemical function is contained in chemical substances called tannins, tannins can help close the broken blood vessels of the nose. Another study mentioned that the
essential oils contained in betel leaves contain betalephenol and chavicol which have benefits to kill germs, antioksidasi, and anti fungi. Betel leaf can press the blood vessels, heal the wounds on the skin, and stop the bleeding. Function of betel leaf as disinfectant or germ killer make this traditional medicinal plant can kill bacteria / germ in nose. In addition to stopping the bleeding, it will reduce the nosed wound due to infection (Eziyi et al., 2009).

Vitamin K diets that are quite important in cases of bleeding. Vitamin K can accelerate blood clots normally, when a person experiencing vitamin K deficiency will experience long bleeding, this also applies to patients with epistaxis. Someone gets enough vitamin K from the liver and green vegetables. Potassium can regulate fluid in the body, including the amount of water it contains. Someone may be at risk of dehydration when they have an imbalance of potassium levels, which can cause the body's tissues to dry out including the inside of the nose that can trigger nose bleeding. The body needs 2,000 mg of potassium daily to prevent dehydration. A person can take potassium supplements or eat bananas, avocados, and tomatoes. Vitamin C has an important role in reducing the risk of nose bleeding. Vitamin C is essential for strengthening blood vessels, including epistaxis. Iron deficiency can be triggered by blood loss, resulting in lethargy and easy bruising caused by an increased risk of bleeding. This bleeding can also occur in the nose (Benskey, 2000; Bunney, 1984).

CONCLUSION

Epistaxis is spontaneous bleeding from the nose. Epistaxis can occur at any age. Epistaxis can be treated with supplements containing bioflavonoid and vitamins (especially B6, C, and K).

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