APITHERAPY - A NATURAL ANTIDOTE FOR ORAL DISEASES: AN OVERVIEW

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ABSTRACT

Natural commodities of honeybees have various ingredients within them, which contribute to their incredible properties. These products have been used in traditional medicine since ancient times, due to its biologically active nature in preventing infections, wound healing and in promoting health. This nature is credited to their antibacterial, antioxidant, immunomodulating, anti-inflammatory and wound healing property. As natural remedies are showing promising results in management of oral diseases in the modern era, this paper attempts to highlight the properties of various products of honeybees and clinical applications in dentistry.

KEYWORDS: apitherapy, antibacterial, honey, oral diseases, propolis

INTRODUCTION

In folk medicine, natural products have been used for several years. Amid these natural products the importance of honey as a therapeutic agent has been well documented in the world’s oldest literature. The medicinal use of commodities obtained from honeybees is known as Apitherapy. According to Dr Stefan Stangaciu, ‘apitherapy’ or ‘bee therapy’ (from the Latin word ‘apis’ which means bee) is defined as, ‘the art and science of treatment and holistic healing through the honey bee and her products for the benefit of mankind and all the animal kingdom.

A diverse commodity of honeybees such as honey, propolis, pollen, royal jelly and bee venom has been used as proxy to the conventional medicines for the treatment of various systemic diseases. Honey is a sweet syrupy substance produced by honeybee from the nectar of flowers and used by humans as a sweetener. Recently honey has been reported to have an inhibitory effect on approximately 60 species of bacteria including aerobes and anaerobes. It was used to treat infected wounds 2000 years ago, prior to the discovery of bacteria as a cause of infection.

Propolis is a resinous material/ sap collected from tree bark and bud, by honeybees which are used to reinforce their hive walls and protect the hives from infection. It has been known to have anti-inflammatory, antibacterial, antioxidant, anticarcinogenic and antiviral activity. Pollen grains are the reproductive spores of seed-bearing plants. Pollen collected by bees from flowers have benefits such as detection and immunization against allergies. A thick, milky mix of nutrients produced from a combination of honey and pollen is Royal jelly. It is a concentrated source of essential fatty acids, vitamins A, B, C, D and E and many other nutrients.

Apitoxin or honey bee venom, is a bitter colourless liquid which consists of a mixture of proteins that causes local
inflammation and acts as an anticoagulant.

LITERATURE REVIEW

Since ancient times honey has been used as a therapeutic agent for variety of systemic diseases such as respiratory diseases, urinary, gastrointestinal and dermatological diseases like ulcers, wounds, eczema, psoriasis, seborrhic dermatitis and dandruff. These diverse utilities of honey are due to its antimicrobial, anti-inflammatory properties. It moreover have unique ability to debride and deodorize wound, stimulate tissue growth from the wound margins and to manage pain and minimize scarring.

Even though honey has numerous sanctified properties, medicinal importance of honey can be ascribed to the fact that, it promotes wound healing by maintaining moist environment, offers antibacterial activity and provide protective barrier to prevent infection.

The antibacterial property of honey was first recognized by Van Ketel (1892). The minimum inhibitory concentration was found to range from 1.8% to 10.8% (v/v). White et al. identified the major antibacterial substance in honey as hydrogen peroxide and also demonstrated that it is produced by the enzyme glucose oxidase of honey. Glucose oxidase, catalyses the oxidation of some of the glucose present in honey to form gluconic acid, the resulting low pH inhibits microbial growth and the by-product hydrogen peroxide kills vegetative cells and microbial spores.

In addition, honey has an imperative property of healing which may be due to its acidic nature and anti-inflammatory properties. This acidic nature of honey decreases the pH of the wound bed and makes more oxygen available from haemoglobin in the blood to the regenerating tissue. Honey has been found to significantly stimulate the release of the cytokines, TNF-α, IL-1β and IL-6 from monocytes, which were known to play an important role in healing and tissue repair.

Its direct nutrient effect on regenerating tissue is due to wide range of vitamins, trace elements and amino acids in addition to the large quantities of readily assailable sugars. Vitamin C content in honey is three times higher than that of in serum which plays vital role in collagen synthesis that aids in wound healing.

CLINICAL APPLICATIONS IN DENTISTRY:

1. Anti halitosis: Microorganisms present in the oral cavity causes putrefaction of debris. This results in production of hydrogen sulphide and methyl mercaptan, which have been related directly to oral malodour. However it has been stated that when candy's containing honey were used, glucose in honey was used by bacteria in preference to amino acids. This would produce lactic acid instead of bad-smelling amines and sulfur compounds.

2. Inhibition of plaque formation: Dental plaque control is a key factor in the prevention of dental caries and periodontal disease. The enzyme glucose oxidase of honey produces hydrogen peroxide due to its natural catalysis reaction. This prevents plaque bacteria organization and formation of biofilms resulting in plaque disorganization. This has been proved when propolis has been used as a chewing gum or mouth rinse.

3. Periodontal therapy: The harm caused by persisting state of inflammation in periodontal disease can be stopped by restraining the pathogenic organisms. Honey has been reported to have an inhibitory effect on approximately 60 species of bacteria including aerobes and anaerobes, gram-positives and gram-negative microorganisms. As honey contains a significant level of antioxidants, they protect the periodontal tissues from the free radicals formed during inflammatory process.

The connective tissue erosion and bone healing is also augmented by stimulating the growth of granulation tissue and epithelial cells.

4. Cariostatic agent: S. mutans is the most frequently associated microorganism, owing its ability to adhere to teeth and survive in acid environment. Glucosyltransferase (GTFs) within dental plaque provide distinct binding sites for oral microorganisms, by facilitating the formation of glucan in situ. Several reports has shown that propolis inhibits the GTFs activity of S. mutans thus preventing caries.

Simone et al. in his in vitro study proposed two possible pathways of cariostatic effect by propolis. First is the reduction of acid production of S. mutans and secondly by inhibiting the proton translocating F-ATPase activity which is one of the means by which S. mutans alleviate their influence of acidification.

5. Pulp therapy: Propolis when used as a pulp capping agent contributes to the hard tissue bridge formation by stimulating the circulation, cell metabolism, various enzymes and collagen formation. This property can be attributed presence of provitamin A, B, vitamin C, arginine and trace minerals.
such as copper, iron, zinc as well as bioflavonoids in propolis.22

6. Intracanal irrigant and medicament: Propolis was as effective as NaOCl when used as an irrigant on extracted human teeth in a study by Al-Qahmi and Al-Madi owing to its antimicrobial nature.22-23 Rezende et al.24 found propolis to be effective against Enterococcus faecalis as intracanal medicaments. Oily nature of propolis promotes low-speed dissociation and dispersal of endodontic paste. Hence its blend with calcium hydroxide could aggregate the benefits of each material.

7. New storage media: As long-term prognosis of avulsed tooth depend on type of storage media and its effect on the periodontal cell viability. Several studies have proven propolis to be effective in maintaining periodontal cell viability. Several type of storage media and its effect on prognosis of avulsed tooth depend on could be reason for its success.

8. Dentinal hypersensitivity: Propolis as a therapeutic agent for dentinal hypersensitivity has been studied by Mahmoud et al. and was proven successful. In vitro studies done by Almas et al. and Sales-Peres et al. propolis was found to occlude the dentinal tubules, thus reducing dentin permeability which could be reason for its success.2

9. Surgical remedial: The analgesic, anti-inflammatory and ability to promote tissue regeneration through stimulation of angiogenesis, growth of fibroblasts and epithelial cells has proven commodities of honeybees to be effective in reducing postoperative complications in various conditions like socket healing in impacted third molars, infraorbicular surgical wounds, dental abscess, sulculoplasty, alveolar osteitis and osteomyelitis.25

10. Soft tissue lesions: Numerous studies reported that propolis a bee hive extract has showed a lesion regression on various conditions like oral candidiasis, oral lichen planus, recurrent apthous stomatitis, radiation mucositis and denture stomatitis when compared with conventional medicines. The anti-inflammatory action and stimulating effect on tissue repair of honey could possibly be beneficial for the relief of these oral conditions.2-3

CONCLUSIONS

Natural commodities of honeybees have various ingredients in them, which contribute to their implausible properties. Its antimicrobial and wound healing bustle have attracted researchers towards the range of clinical applications in dentistry. However the ingredients of these commodities vary widely because of climate, season, location and chemical formulation. Hence extensive research is necessary to determine a standard formulation for therapeutic use and to consider its success rates as well as its potential adverse effects.

REFERENCES


