HONEY - A BOON TO ORAL HEALTH: A REVIEW

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ABSTRACT

Honey has lately been used in a variety of medical conditions owing to its anti inflammatory, anti oxidant and anti bacterial properties. Honey is essentially a highly concentrated water solution of two sugars, dextrose and levulose. Apart from sugars, honey also contains several vitamins, especially B complex and vitamin C, together with a lot of minerals. Some of the vitamins found in honey include ascorbic acid, pantothenic acid, niacin and riboflavin; while minerals such as calcium, copper, iron, magnesium, manganese, phosphorus, potassium and zinc are also present. Modern science is finding evidence for many of the historical uses of honey. This article is mainly to review the importance of honey in oral care.

KEYWORDS: Honey, antibacterial, oral health

INTRODUCTION

The consumption of honey has a very long history among human beings. It has been used in innumerable foods and beverages as sweeting and flavoring agent. Since ancient times, honey has been known for its nutritive and therapeutic values. Honey is produced all over the world. The most important ingredient of honey is carbohydrates present in the form of monosaccharides, fructose, glucose and disaccharides, maltose, isomaltose, maltulose, sucrose and turanose and the sweetness of honey is due to presence of these ingredients. It also contains oligosaccharides including the anderose and panose and enzymes including amylase, oxidase peroxide, catalase and acid phosphorylase. Furthermore, honey contains amino acids, trace vitamin B, Vitamin B6, Vitamin C, niacin, folic acid, minerals, iron, zinc and antioxidants. Honey is commonly used as an anti-inflammatory, anti-oxidant and anti-bacterial agent

Modern day treatment options end up resulting in multidrug resistance and several other side effects. This urges to quest for alternate options. Currently, natural products are contemplated as a practical alternative approach to halt the ever increasing rebuke of diseases and some of their unavoidable
side effects. Recently, honey as a natural product has clinched the attention of researchers as a complementary and alternative medicine.

**ANTIBACTERIAL ACTIVITY**

The medicinal importance of honey has been known since ancient times and its antimicrobial property as well as wound-healing activities was well-known long ago. The first written reference for honey was a Sumerian tablet writing dating back to 2100-2000 BC, which mentioned honey’s use as a drug and an ointment. Mechanisms of antimicrobial activity of honey are different from antibiotics, which destroy the bacteria’s cell wall or inhibit intracellular metabolic pathways. The antimicrobial activity in most honeys is due to the enzymatic production of hydrogen peroxide. However, another kind of honey, called non-peroxide honey (e.g. manuka honey), displays significant anti-bacterial effects even when the hydrogen peroxide activity is blocked. The antibacterial activity is related to four properties of honey. 1) Honey draws moisture out of the environment and thus dehydrates bacteria. 2) The sugar content of honey is also high enough to hinder the growth of microbes. 3) The pH of honey is between 3.2 and 4.5, and this acidity is low enough to inhibit the growth of most microorganisms. 4) Several phytochemical factors for antibacterial activity have been identified in honey. Antibacterial activity of honey is one of the most important findings that was first recognized in 1892; by van Ketel

**ANTIOXIDANT PROPERTIES**

Natural honey contains many flavonoids (such as apigenin, pinocembrin, kaempferol, quercetin, galangin, chrysin and hesperetin), phenolic acids (such as ellagic, caffeeic, p-coumaric and ferulic acids), ascorbic acid, tocopherols, catalase, superoxide dismutase, reduced glutathione, Maillard reaction products and peptides, most of which work together to provide a synergistic antioxidant effect. The food containing antioxidants have been shown to improve the health. The literature suggests that honey contains potent anti-oxidative agents. As an antioxidant, honey has numerous preemptive properties against many clinical conditions such as inflammatory disorders, coronary artery diseases, neurological worsening, aging and cancer. The substances such as polyphenols and phenolic acids found in honey vary according to the geographical and climatic condition.

The presence of free radicals and reactive oxygen species (ROS) is of the outmost importance in the process of cellular dysfunction, pathogenesis of metabolic and cardiovascular diseases as well as aging. The consumption of foods and substances rich in anti-oxidants may protect against these
pathological changes and consequently prevent the pathogenesis of chronic inflammatory disorders. Researchers have reported that honey contains several important substances and these include mainly anti-oxidants.

**ANTIINFLAMMATORY AND WOUND HEALING PROPERTIES**

An anti-inflammatory action and a stimulatory effect on angiogenesis and on the growth of granulation tissue and epithelial cells have been observed clinically and in histological studies. The components responsible for these effects have not been identified, but the anti-inflammatory action may be due to antioxidants, the level of which varies in honey. The stimulation of tissue growth may be a trophic effect, as nutrification of wounds is known to hasten the healing process: the level of the wide range of micronutrients that occur in honey also varies. In a recent study, it has been reported that honey reduced the activities of cyclooxygenase-1 and cyclooxygenase-2, thus showing antiinflammatory effects. Furthermore, ingestion of diluted natural honey has produced reductions on concentrations of prostaglandins such as PGE2 (prostaglandin E2), PGF2α (prostaglandin F2a) and thromboxane B2 in plasma of normal individuals. Interestingly, in an inflammatory model of colitis, honey was as effective as prednisolone treatment. While NSAIDS and corticosteroids may have many serious side effects, honey has an anti-inflammatory action free from major side effects.

**HONEY AND ORAL HEALTH**

Mouth is considered as the mirror of the general health of human body. Oral cavity harbors billions of microorganisms, some of these contribute to the development or progression of systemic diseases such as cardiovascular disease, diabetes mellitus, etc. Oral health and general health is interrelated. So it is very important to maintain oral health. Owing to the properties of honey, researchers have found a strong correlation between the use of honey and oral health.

**Anti bacterial effect on oral microbes:**

Honey induced bacteria growth at low concentrations, while at high concentrations honey had an inhibitory effect on bacterial growth in vitro. Salivary counts of total bacteria and Streptococcus mutans were lower for 1 hour after application of honey. The antibacterial effect of the honey tested may be attributed to its osmolarity effect.
Use of honey in gingivitis:

Gingivitis is known to be the most commonly seen oral disease and mainly results from plaque biofilm. Use of honey has been found beneficial as it inhibits plaque maturation and has potent anti-inflammatory properties. A chewable manuka honey leather was used in a pilot study for 21 days. The mean plaque score and bleeding sites were significantly lower and hence could be studied further for mainstays in oral health maintenance.

Use of honey in periodontitis:

Periodontitis is a chronic inflammation that occurs in response to the presence of sub gingival bacteria. Porphyromonas gingivalis, an anaerobic gram-negative bacterium plays crucial role in the pathogenesis; hence the antiinfective regimen is an essential part of therapy. Honey acted as growth inhibitory on P. gingivalis as a major periodontopathogen. Therefore an addition of honey or its compounds to oral health-care products may have potential in prevention and treatment of periodontitis.

Honey in cancer care:

Most of the oral cancers are treated by surgery, radiotherapy, chemotherapy or a combination escorted by restoration therapy. Oral mucositis is the most frequent, distressing, painful, clinical side effect of radiotherapy. In a study, after topical application of honey there was significant reduction in the symptomatic grade 3/4 mucositis among honey-treated patients compared to controls. Topical application of natural honey is a simple and cost-effective treatment in radiation mucositis.

CONCLUSION:

After having reviewed the potent properties of honey it can be concluded that it provides a very safe and natural alternative to health care. The studies conducted are still in infancy and more multicentric studies and trials are needed to establish its therapeutic benefit. Within the limitations of the studies conducted we can hope that the traditional use of honey takes a position in the mainstream medicine as an effective alternative option with limited adverse effects and resistance.
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