

Phytotherapy applied to Dentistry: A literature review

Fitoterapia aplicada à Odontologia: Uma revisão de literatura

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Abstract

Objective: The objective of this narrative literature review article was to address the origin and history of Phytotherapy, some types of herbal medicines and their benefits within dentistry, addressing how the production of a herbal medicine occurs and what difficulties may exist within Phytotherapy. **Methodology:** Searches and research were carried out using descriptors, websites, newspapers and other databases, including: Research, society and development journal, Web of Science, DeCs, VHL/BIREME, Science Direct, PUBMED Central, The Cochrane Library, Scielo journals and gray literature. **Results:** We obtained the result that Phytoterpia has great utility and benefits within dentistry, positive points given its low market value and mainly due to its antibacterial, anti-inflammatory, antihemorrhagic, anesthetic and other functions.

Keywords: Phytotherapy; Antibacterials; Anti-inflammatories; Anti-hemorrhagic; Herbal medicine.

Resumo

Objetivo: O objetivo deste artigo de revisão narrativa de literatura foi abordar a origem e história da Fitoterapia, alguns tipos de fitoterápicos e seus benefícios dentro da odontologia, abordando como ocorre a produção de um fitoterápico e quais dificuldades podem existir dentro da Fitoterapia. **Metodologia:** As buscas e pesquisas foram realizadas utilizando descritores, sites, jornais e outras bases de dados, incluindo: Revista de pesquisa, sociedade e desenvolvimento, Web of Science, DeCs, BVS/BIREME, Science Direct, PUBMED Central, The Cochrane Library, Periódicos Scielo e literatura cinza. **Resultados:** Obtivemos o resultado que a Fitoterapia possui grande utilidade e benefícios dentro da odontologia, pontos positivos dado seu baixo valor de mercado e principalmente devido às suas funções antibacteriana, anti-inflamatória, anti-hemorrágica, anestésica e outras.

Palavras-chave: Fitoterapia; Antibacterianos; Anti-inflamatórios; Anti-hemorrágico; Medicamento fitoterápico.

Resumen

Objetivo: El objetivo de este artículo de revisión narrativa de la literatura fue abordar el origen e historia de la Fitoterapia, algunos tipos de medicinas herbarias y sus beneficios dentro de la odontología, abordando cómo ocurre la producción de una medicina herbaria y qué dificultades pueden existir dentro de la Fitoterapia. **Metodología:** Se realizaron búsquedas e investigaciones utilizando descriptores, sitios web, periódicos y otras bases de datos, entre ellas: Revista de investigación, sociedad y desarrollo, Web of Science, DeCs, BVS/BIREME, Science Direct, PUBMED Central, The Cochrane Library, revistas Scielo y literatura gris. **Resultados:** Obtuvimos como resultado que la Fitoterapia tiene gran utilidad y beneficios dentro de la odontología, puntos positivos dado su bajo valor de mercado y principalmente por sus funciones antibacteriana, antiinflamatoria, antihemorrágica, anestésica y otras.

Palabras clave: Fitoterapia; Antibacterianos; Antiinflamatorios; Antihemorrágico; Medicina herbaria.

1. Introduction

The word "phytotherapy" originates from the Greek, in which "phyton" means plant and "therapeia" means treatment. This type of practice, therefore, is an alternative therapy that has records of use dating back to approximately 4000 BC in different parts of the world (Hostettmann et al., 2003). In Brazil, herbal medicine was introduced through the practices of indigenous peoples, which were later combined with the methods of Africans and European colonizers over the years (Alves & Silva, 2003). This interrelationship between different cultures has contributed significantly to increased human survival and the advancement of health. The use of plants in treatments has spread and evolved, eventually leading to the development of allopathic medicines from conventional medicine and herbal medicines, which have lower financial costs and can be handled in an office, hospital or industrial manner (Pasquini, 2005). In addition to being the only treatment option for many Brazilian populations for cultural and economic reasons.

Phytotherapy aims to prevent, alleviate or cure symptoms of diseases that affect human health (Xavier et al., 2004; Nakagawa et al., 2013; Bottan et al., 2007). Compared to synthetic medicines, herbal medicines are more affordable for both individuals and public health services, due to the absence of technological patents (Oliveira, 2002; Loggia et al., 2008). This economic advantage, combined with its antibacterial, anti-inflammatory, antihemorrhagic and anesthetic benefits, contributes to the increased demand for phytotherapy as an alternative and complementary therapeutic option in clinical practice. They are available in different forms, such as teas, tablets, solutions, gels and ointments, which are prescribed and used by healthcare professionals in specific treatments (Loggia et al., 2008; Evangelista et al., 2013; Francisco, 2010; Silva et al., 2016).

Therefore, this literature review article aims to describe the history of phytotherapy in society, with an emphasis on its use in dentistry (Aleluia et al., 2015), as well as point out the main plants used by the culture of the Brazilian population to obtain the therapeutic benefits of this modality. treatment alternative.

2. Methodology

This article is a narrative literature review, which through readings in the work of Rother (2007), we obtained the necessary knowledge to develop the article, from its methodology and structure that must be followed. To carry out the article, searches were carried out on the following topics: Phytotherapy, Phytotherapy Plants and Phytotherapy within dentistry. Online searches were carried out with the aim of gathering as much information as possible, available in the following databases: Research, society and development journal, Web of Science, DeCs, VHL/BIREME, Science Direct, PUBMED Central, The Cochrane Library and Scielo journals.

3. Results

3.1 Phytotherapy plants and their benefits in dentistry

3.1.1 Chamomile (*Matricaria chamomilla*)

Chamomile, a plant used in phytotherapy which has 23 different species in its genus, is a herbal medicine that has a range of benefits in health treatments, being constantly tested and evaluated in several clinical studies by various professionals and researchers in the field. health, having great importance and usefulness in dentistry (Costa et al., 2019).

A large number of scientific researches, after many tests and studies carried out on chamomile, came to the conclusion that this herbal medicine has advantages and uses, being used, for example, in toothpaste formulas, considering that this plant has the ability to reduce halitosis and combat gingivitis.

Furthermore, chamomile has antimicrobial action from the extract of its flower, acting directly on the microorganisms of the dental biofilm, which prevents possible actions carried out by these agents and also triggers a response against fungi, preventing their proliferation (antifungal response), anti leishmania and serves as a kind of sedative (Peixoto et al., 2011). This herbal medicine goes further within its large number of functions, being attributed to the fight against inflammation processes of the oral mucosa and gums, action on canker sores, abscesses, and in the treatment and combat of dental eruptions due to its great analgesic action (Rodolfo et al., 2013).

3.1.2 Clove (*Syzygium aromaticum*)

Clove is a type of herbal medicine originating in Asia (Indonesia) being its natural location, however, it has the capacity to be cultivated in different parts of the world, including Brazil, which has the conditions and capacity to cultivate and reproduce the tree that originates it.

This planting can have several benefits and functions from the extraction of eugenol, an essential oil that has the function of reducing painful sensations in individuals (analgesic function), and is also commonly used in antiseptics and disinfection (antimicrobial) (Valério et al., 2019; Daniel et al., 2009).

3.1.3 Curcumin or Turmeric (*Curcuma longa*)

Curcumin or Saffron, as it is better known in society, has numerous advantages to help the cells of the human body, one of which is the antioxidant function that occurs from its important and essential phenolic structure, which does not destabilize the carbonic bonds found in the environment, without affecting the cellular structure, contributing to the functionality of the organism (Oliveira et al., 2013).

In addition to the antioxidant functionality produced by Saffron, it also has the ability to defend against infections in vitro, as stated by several authors, based on research carried out on its extract, which has functionality against an infection generated by *Streptococcus mutans*, in addition to combating other types of microorganisms that cause harm to human homeostasis (Figueira et al., 2020).

3.1.4 Cat's claw (*Uncaria tomentosa*)

Based on ancient data and sources, along with research carried out, researchers came to the conclusion that the Cat's Claw species has been used for more than centuries by people who inhabit the tropical areas of South America, in addition to the original peoples (indigenous) from the Brazilian Amazon forest, who use this plant to this day through common heredity within their culture, which ends up serving both as a historical source and as a contributor to the advancement of health.

This particular herbal medicine has an antimicrobial function, through its composition that has components such as: alkaloids, oxindoles, triterpenes, vegetable steroids, phenolics, glycosides, tannins and flavonoids, these being different types of compounds, responsible for triggering a defense response. and action against various types of invaders in the human body, such as bacteria, mold and fungi that aim to break human homeostasis.

Within its functionality, cat's claw also performs other types of reactions, such as those against certain types of inflammation, it serves to control and prevent oxidation, it serves as an antineoplastic and as an immunostimulant (Vilegas et al., 2000; Herrera et al., 2010; Loiola et al., 2020; Ccahuana-Vasquez et al., 2007).

3.1.5 Pomegranate (*Punica granatum*)

Pomegranate, a fruit that has great benefits when used in certain treatments, such as: fighting throat infections, fever and coughs caused by external invaders, based on its antibacterial and anti-inflammatory mechanism.

This fruit has great use against the constituents of the oral biofilm generated by bacteria in the mouth region, whether gram-positive or gram-negative, preventing bacterial adhesion to the tooth surface through reactions against their fixation mechanisms on the wall. of the teeth (Sodré et al., 2018; Morais et al., 2017; Estevão, 2005; Zavarize et al., 2020). Another great acquisition of pomegranate is its usefulness in the area of periodontics, as it has action against oxidation, providing periodontal treatment with greater effectiveness through its antioxidant property, being commonly used against periodontitis, and in stomatitis treatments, through its functionality antiseptic (Nogueira et al., 2016).

3.1.6 Propolis (*Apis mellifera*)

The herbal medicine *Apis mellifera*, better known as Propolis in people's daily lives, is a specific resin produced only by bees and which is very useful in treatments within dentistry, having many functions in various types of attacks on the balance of human oral health, through antiviral actions due to its contribution to immunity, antioxidant factors, serves as an anesthetic, improves and enhances tissue healing and can be used in antiseptics.

Within dentistry, Propolis also has more specific and essential functions in several dental specialties, it serves to combat bacteria, fungi and other microorganisms, it can also be used as an intracanal irrigant in endodontics, it triggers the function of a cariostatic agent, and with a useful in the treatment of candidiasis and periodontitis. This medicine derived from phytotherapy has great potential for anti-inflammatory action, which occurs through the existence of caffeic acid in propolis and flavonoids, which cause an inhibitory effect on the production of arachidonic acid, affecting the production of prostaglandins in the body.

Propolis also contains iron and zinc, which are important for the production of collagen, in addition to stimulating various enzymatic systems and cellular metabolism (Rattmann et al., 2009; Dantas, 2002). Furthermore, studies state that the use of propolis should be accompanied. , with care and preferably by specialists in herbal medicine, as it is a substance that can cause nausea and vomiting, if there is contact with other drugs in their interactions, such as metronidazole and the drug disulfiram, which can cause allergic reactions in certain people (Almeida & Mattos, 2000), it is extremely important to monitor health professionals who have expertise in this area, so that possible future fatalities do not occur in a person's health.

3.2 Historical Accounts of Phytotherapy

Phytotherapy is often also referred to as ancient medicinal therapy and this is not for nothing (Agra et al., 2007). Its use is so prehistoric that it is not possible to determine a specific moment in which its use began, but rather, it is only possible to deduce that this practice took place at some point in the development of *Homo Sapiens*, around 300 thousand years ago (Bonamin et al., 2003).

Thus, during the development of the human species, the constant recognition of plants allowed the creation of primary herbal medicines, which were used to treat injuries from the mundane exposure of hunter-gatherers, for example (Solheim, 1996). This actively contributed to the increase in life expectancy, due to the greater chance of survival in the face of adversity, in addition to continuing full human development until the formation of ancient complex and organized societies, which even so, continued to use and propagate herbal therapies (Guarim Neto et al., 2005).

The society of Ancient Egypt, from 1850 BC, was one of the first to develop a somewhat more grounded herbal medicine, which guaranteed applications for various comorbidities, such as the treatment of abscesses in the oral cavity, already demonstrating a strong dental character (Carvalho et al., 2017). Other peoples also stood out in this area, such as China, with its traditional medicine dating back to 3000 BC, Spain, which was widely used and expanded during the great voyages; in addition to the native peoples of South America, where its use in religious rituals was common (Bueno et al., 2002; Tournon et al., 2015; Berdonces, 2003).

3.3 Difficulties and problems attributed to herbal medicines

Among the obstacles that affect the production of herbal medicines, we have examples of the quality of the product obtained and which will be destined for medicine, in which the plants used may end up with several different impurities, including examples such as: roots, stems, leaves, seeds, insect remains and other waste originating from nature or external environments and which may make up these compounds, which may lead to harm, low quality and impacts on the effects of remedies derived from phytotherapy. Causing the disposal or refund of these “impure” plants, as they have come into contact through other means or components, in addition to the choice of a new distributor that has greater quality control (Dalla Costa & Miguel, 2001; Alecrim et al., 2017).

The majority of those trained in herbal medicine use synthetic medicines combined with herbal medicines, using the commercial and best-known names of herbal medicines, caused by the frequent lack of acceptance on the part of health professionals and their patients, who avoid prescribing medicines of this type even if they have proof. scientific evidence that validates the efficiency and safety of these products. Obtaining the result that the way in which these medicines are presented and accepted, in addition to the qualities of the raw materials provided by their respective producers, have a decisive impact on the choice and acceptance of phytotherapy as a possible treatment to be prescribed by health professionals and used by the population (Spínola, 1997; Carvalho et al., 2001).

3.4 Production of herbal medicines

The production of herbal medicines is quite complex and detailed, requiring extreme attention, knowledge and specific skills in the production cycle of these medicines, which must be linked to the quality concepts that are currently in force, namely: compliance with pre-established requirements, users of the medicine and the satisfaction levels of the respective producer, thus obtaining the expected result. Bearing in mind that it is necessary to use all skills and understanding about the production of products derived from phytotherapy, which, together with the standards determined to be followed in the step-by-step production process, achieves the total quality of the medicine (Pasquini, 2005).

The quality control that will be used is related to the type of raw material that will be used in the production of the herbal medicine, this control being relative and changeable, depending on the manufacturer's determination and objective, in addition to the importance during manipulation and the way in which this product will be preserved, which may also affect this quality supervision. It is necessary to follow all conservation and handling standards determined by the respective producer (Pasquini, 2005).

The type of material that will compose the packaging of the herbal medicine has a great role, due to the need for it to have the capacity to absorb substances in their reactivity, needing to be impermeable to vapors or gasses coming from the senses both inside the packaging and from the external environment, being of essentially, a good quality of packaging that cannot deteriorate, which could generate residues and compounds that are not part of the composition of the medicine, compromising the quality and its performance. Therefore, it is of great importance and responsibility that the person responsible for the production and establishment of the product has complete and safe control over the types of materials that will make up the packaging, so that the herbal medicine can be correctly stored (Pasquini, 2005; Querido & Santos, 2022; Quiles & Gil-Izquierdo, 2023).

4. Discussion

Phytotherapy is a therapy that has existed in the world for more than thousands of years and has been used since its creation until today, which has a natural origin and which, when used correctly, triggers a beneficial response to dental treatments, and which it makes up several products used in procedures in addition to being in the composition of many allopathic remedies.

However, phytotherapeutics have different ways and approaches from allopathic products, which is positive in certain types of treatments, and which can offer greater good aspects to oral health when the phytotherapeutic plant is used for its respective function. Therefore, it is necessary that dental surgeons seek to train themselves, so that the use of the herbal medicine that is being used occurs with knowledge, and that reports of clinical results are made, aiming for more dentists to know about the benefits and seek to understand more about this therapy. However, there is a big problem, which is the disbelief of many dental students and professionals, who believe that these medicinal plants do not work and that they actually have a placebo and psychological effect.

It would be extremely important for Phytotherapy to be covered more during dental graduation, so that dentists know about the topic since their training, bringing greater knowledge around the subject in addition to the fact that they will learn about how to use it in their life of care.

A great positive point is the value of products derived from phytotherapy, which have low values when compared to allopathic medicines that are more prescribed and used, so these medicines can be purchased more affordably by patients who are prescribed them, being a more inclusive medicine. Regardless of the financial condition that a given patient has, however, many people do not have knowledge about herbal medicines because of the great marketing force that exists in the allopathic industry, and its incentives and bonuses for pharmaceutical representatives.

5. Conclusion

Phytotherapeutics are a form of alternative medicines that have a low financial cost and that appear to be highly useful and effective when used in treatments for various processes that affect oral health and in the treatment against pathogens within dentistry. However, there needs to be more research into phytotherapeutic plants and their benefits, and there is a need for more case reports demonstrating their use and effects in daily clinical life, which should be published on websites and newspapers so that more dentists are aware of about this method, causing its use to be disseminated within dentistry, which will lead to an improvement in dental treatment.

Aiming at the dissemination of Phytotherapy, it is necessary that more studies be carried out that address the topic and its benefits when applied to dentistry, reporting each herbal medicine and its effect on oral health and how its production and use occurs, and after its use, reporting through of case reports what this product has triggered, so that more and more dental surgeons can gain knowledge of these medications, so that dental care can advance more and more.

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