Oral Manifestations Of Tobacco And Cannabis Smoking

Ayush Jaggi
Dental Intern, MGM Dental College and Hospital, Navi Mumbai, Maharashtra, India

ABSTRACT: In this article we review the oral manifestations of tobacco and cannabis smoking. We also compare the contents of both tobacco and cannabis and how they differ from each other, along with their manifestations in the oral cavity.

KEYWORDS: Smoking, Tobacco, Nicotine, Cannabis, THC, Precancerous Lesions, Periodontium, Halitosis, Staining

I. INTRODUCTION

Smoking can be referred to as a practice wherein a substance is burned and the smoke is breathed in and tasted and is absorbed by the body through the bloodstream. A lot of substances are available for the practice of smoking, Tobacco being the most popular followed by cannabis. Other substances that are used through this recreational drug use are crack, opium, meth, DMT, heroine, etc. While a lot of debate has been present over the past few years regarding the practice of smoking and its direct link to cancer amongst individuals, there are a lot of differences between the practice of smoking tobacco and smoking cannabis. ‘Smoking causes cancer, smoking kills’ stands true till the end of time but not all smoke was created the same. Before one understands the difference between tobacco and cannabis smoking, the physiology behind the practice needs to be understood.

II. PHYSIOLOGY

Inhalation of substances is one of the quickest and effective ways of administrating a drug into the bloodstream. The main mechanism of action can be summarised such that the gas/smoke of the substance is directly diffused into the pulmonary vein following which it reaches the heart and then finally the brain. The alveoli present in the lungs have a major role in the practice of smoking. They are used as administrators for drug use. The substances once inhaled cause the nerve endings in the brain to trigger stimulation since they are similar to naturally occurring endorphins and dopamine causing a pleasant feeling. This resultant state of mind can be referred to as ‘high’. The ‘high’ can be mild from substances such as tobacco, intermediate from substances such as cannabis or intense ‘euphoria’ from substances such as cocaine, heroin [1]

III. METHODS OF SMOKING

There are a variety of methods through which substances can be smoked. The most common method of tobacco inhalation is through cigarettes and cigars [2]. In countries like India and the Middle East, they can also be smoked through pipes referred to as Hookah or Shisha or through Bidis [3] (flaked tobacco rolled in tendurni leaf) Tobacco can also be consumed through chewing. On the other hand, cannabis can be smoked through pipe-like equipment such as bowls, water-bongs (water or ice is added to reduce the temperature of the smoke intake) [4], cigarettes or more commonly joints (the term ‘joint’ is a slang for cigarettes filled with cannabis instead of tobacco and usually contains 250–750 mg net weight of cannabis and/or fillers) [5]. The pipes are made of a variety of substances such as ceramics, stones, woods, bamboos, etc.

IV. EFFECTS OF SMOKING

Inhalation of smoke and its immediate absorption has various adverse effects no matter what the substance being smoked. Combustion of plants (mainly tobacco and cannabis) leads to formation of carbon monoxide that can lead to impairment in the ability of blood to carry oxygen [6]. Other adverse effects of smoking include cancer (most commonly mouth and lung), infertility and impotence, heart strokes.

V. IMPACT

While under the influence of tobacco, individuals get a ‘kick’ that helps in relieving stress and anxiety. Therefore a lot of individuals begin smoking cigarettes at a very young age. Another reason for tobacco smoking is that it helps many individuals stay up, sort of like a substitute to caffeine, refreshing them through the day. The main ingredient responsible is nicotine. When one smokes tobacco, the nicotine present is pyrolyzed causing a somatic dependency in the individual which is mild. There is however, formation of Harmane which is derived from the acetaldehyde present in the cigarette
smoke which plays a major role in the dependency and addiction of an individual to nicotine and cigarette smoking in general. On the other hand, individuals under the influence of cannabis experience euphoria, auditory as well as visual hallucinations. This is due to the presence of tetrahydrocannabinol (THC) a type of cannabinoid. Cannabinoids are the chemical compounds present in cannabis. Not all smoke is created equal. There are differences between the contents of tobacco as well as cannabis that cannot be ignored. However, regardless of their differences, they affect the oral cavity in similar ways, making it difficult for individuals to maintain proper oral hygiene [7] [8]

VI. ORAL MANIFESTATIONS OF TOBACCO AND CANNABIS SMOKING

A. Oral Cancer and Precancerous Lesions: Oral cavity is one of the sites that are at the highest risk of developing cancer (the list includes lungs and the larynx) Oral cancer is directly proportional to intensity, duration as well as frequency of the practice. Oral cancer arises from changes in mutation of cells and chromosomes caused due to smoking. Oncogenes are activated due to mutations of the DNA. World Health Organisation defines premalignant lesion as a morphologically altered tissue in which cancer is more likely to occur than in its apparently normal counterpart. The precancerous condition in its turn is a ‘generalised state associated with a significantly increased risk of cancer [9]. Most commonly occurring premalignant lesions involve Leukoplakia, Oral Submucous Fibrosis; Leukoplakia is the most common potentially occurring malignant lesion of the oral mucosa. It has a strong male predominance and occurs more frequently in smokers than in non-smokers. It is referred to as ‘white patch’. Axell T (1996) defines Leukoplakia as a ‘predominantly white lesion of the oral mucosa that cannot be characterized as any other definable lesion: some oral Leukoplakia will transform in to cancer’. Leukoplakia can be classified as:

- Candidal Leukoplakia
- Hairy Leukoplakia
- Tobacco-Induced White Lesion (smoker’s palate)
- Tobacco-associated Leukoplakia (tobacco induced white lesion)
- Idiopathic Leukoplakia [10]

Oral Submucous Fibrosis is a chronic, progressive, scarring disease that is associated with burning sensations, ulcerations, excessive salivation or dryness and is usually manifested in the cheeks and the palate [11].

NOTE: Smoking causes changes in their ability to multiply, metastasis, replicative potential, etc. Components of cannabis smoke minimize some carcinogenic pathways whereas tobacco smoke enhances some. Tobacco smoke usually contains benzo (a) pyrine and nitrosamines. These play a major role in enhancing chances of oral cancer. On the other hand, contents of cannabis help in inhibiting the process. The presence of THC helps in inhibition of the enzyme that regulates and activates the carcinogens that are found in smoke in general. Receptors of Cannabinoids have also been found in epithelial cells of the respiratory system. They therefore help in controlled damage of the DNA. In contrast, nicotine present in tobacco acts in catalysing the angiogenesis of tumour whereas cannabis inhibits this promotion [12].

B. Smoking and Periodontal Disease:

Smoking is considered as a major risk factor in the progression as well as development of various diseases of the periodontium.

Physiologic changes of smoking include

- Clinical Inflammation is less as there is an alteration in the inflammatory response of the gingiva.
- With increased inflammation however, there is a decrease in gingival blood vessels.
- There is a decrease in the flow of Gingival Crevicular Fluid
- Bleeding on probing reduced.
- Decrease in sub gingival temperature
- Increase in time as compared to normal in the recovery from local anaesthesia in routing clinical treatments
- Increase in pocket depth
- Increase in bone loss
- Loss of attachment
Commonly occurring clinical signs include gingival recession, involvement of furcation and in severe cases chances of mobility.

Immunology of Smoking and Periodontal Diseases: Due to smoke, there is an alteration in the neutrophil chemotaxis. Along with this, there is an increase in tumour necrosed factor-alpha and prostaglandin E2 in the gingival Crevicular fluid. In cases of tobacco smoking, Nicotine adversely affects the fibroblast activity. Nicotine also suppresses the proliferation of osteoblasts. Most importantly products of Tobacco alter the normal regenerative potential along with the reparative properties of the periodontium.

Effects of Smoking on Dental Structures are as follows:

- **Teeth:**
  1) Staining
  2) Poor Oral Hygiene
  3) Increase in formation of Plaque and Calculus

- **Gingiva:**
  1) Discolouration (and Hyperkeratosis)
  2) Smokers tend to have a reported higher proportion of small blood vessels and a smaller proportion of large blood vessels (due to the suppression of gingival inflammatory response)
  3) Smokers tend to have a higher susceptibility towards Acute Necrotizing Ulcerative Gingivitis due to vasoconstriction, proliferation of microbes as well as reduced activity of oral leukocytes.

Smoking also effects periodontal therapy that causes a delay in healing as well as inflammation and bleeding weeks after cessation of smoking as gingiva tends to lose its fibrotic appearance [13]

C. **Staining:**

Pigmented deposits on the surface of the tooth are referred to as stains. Smoking is highly associated with extrinsic stains. These stains are usually present on the external surface of the tooth, but can be removed by procedures of scaling and polishing as well as proper tooth brushing techniques.

Stains are seen as dark brown or blackish deposits with brown discolouration of the surface of the tooth usually seen along the lingual surface of the tooth.

Staining usually occurs because the products of combustion penetrate the pits and fissures, enamel and dentin. However the degree of staining is not directly proportional to the amount of cigarettes or joints per day. It usually depends on pre-existent coatings that have been acquired.

D. **Halitosis:**

One of the main oral findings of a smoker is halitosis or in simple terms noticeably unpleasant odour exhaled on breathing. Halitosis due to smoking (especially Tobacco) is a cause for Genuine Physiological Halitosis.

Pathogenesis: Halitosis is usually a result of microbial putrefaction of food debris, blood, saliva in the oral cavity. Proteins undergo proteolysis and form peptides and amino acids. The substances that are a result of this with free thiol groups (such as cysteine) rises to form VSC’s (Volatile Sulphur Compounds) which are substances that cause malodour [14]

VII. **CONCLUSION**

The effects of smoking tobacco and cannabis have been researched for a long period of time. While cannabis is free of nicotine, it consists of THC. Studies have suggested that THC has properties that help them act like bronchodilators, thus aiding the human body. Cannabis has been a part of history for various other medical benefits as well. In contrast, tobacco contains nicotine which is highly addictive to individuals. But amongst the black and the white, there is a grey area that clearly suggests that smoking tobacco and/or cannabis have adverse effects to an individual. Smoking is an irreversible process. Thus, there are only two treatments for this practice; prevention and cessation. Prevention is better than cure, but there really is no cure. However, due to increased peer pressure and the ‘high’ that the substances provide, there are chances that the practice commences at an earlier age thus increasing the duration of the practice. Various organizations such as the WHO (World Health Organization) aim at providing education about the adverse effects of smoking. Cigarette boxes have printed images of the ill-effects and there are various by-laws regulating the sale of tobacco as well as cannabis. In countries like India, theatres screen anti-tobacco videos before the start of movies and also provide warning signs against smoking in scenes where an artist is seen practicing smoking. Cigarette boxes also display the effects of smoking on their boxes, an effort to increase awareness amongst users. [15] Tobacco sales are also limited to individuals.
below a certain age whereas cannabis is not very easy to find. Majority of the countries have also favoured for laws that criminalise possession and intake of cannabis [16]. Cessation on the other hand helps professionals work on the adverse effects and stop them from further harming the individual. However not much research has been conducted on the benefits of cessation of tobacco but it is highly motivated. Rehab centres and other such programs aim at providing a permanent stop to such practices while helping individuals regain their social confidence and not feel isolated. In summary, findings have stated that both cannabis and tobacco smoking have adverse oral effects as well as other health effects. However contents vary amidst the two causing changes in their pathogenesis.

VIII. REFERENCES

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IX. BIOGRAPHY

Ayush Jaggi is currently an intern at the MGM Dental College and Hospital, Navi Mumbai, Maharashtra, India. He will complete his Bachelors in Dental Surgery in September of 2017. His interests lie in Healthcare, Public Health and Global & Sustainable Development.