

# TOBACCO: POISONING, ADDICTION AND DE-ADDICTION – AYURVEDA AND CONTEMPORARY PERSPECTIVE

## Abstract

Tambhakhu (Tobacco) are the leaves of the tobacco plant (*Nicotiana Tabacum*), termed as Tamraparn in Ayurveda. It contains toxic alkaloids, the principal alkaloid being Nicotine present in one to eight percent. Tobacco is the highly consumed psychotropic drug worldwide. Tobacco can be consumed in various forms that is- sniffing, chewing, smoking or dipping. It is more addictive than cocaine and heroin and acts as a mood leveler, resulting in emotional dependence. Tobacco poisoning can occur by absorption either through intact or broken skin, by inhalation or ingestion. Nicotine first stimulates, then depresses, and later paralyzes autonomic ganglia, brain and skeletal muscles. According to Ayurveda the properties of tobacco are similar to poison. The adverse effects or overdosing effects are noted as- Bhramaka (Induces vertigo), Madakarit (narcotic), Drishtimandyatwa (blindness). The Circumstances of tobacco poisoning mainly occurs through accidental poisoning while suicidal and homicidal poisoning is rare. Tobacco consumption gradually blocks economic, personal and social development. In order to quit this habit it is recommended to gradually reduce tobacco use instead of abruptly stopping. An organized plan for de-addiction includes three phases Assessment, Intervention and Follow up. It is the duty of every Physician, National authorities and a Responsible citizen to create awareness about the destructive effects of tobacco consumption.

**Keywords:** Tobacco Consumption, Poisoning, Addiction, De-Addiction

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## I. INTRODUCTION



**Figure 1:** Tobacco Plant

**Latine Name:** *Nicotiana tabacum*

**Family:** Solanaceae.

**Vernacular name:**

Sanskrit: Tamraparn

Hindi: Tamaku

English: Tobacco

**Classification:**

Ayurveda: Vanaspatij (Sthavara) visha [1]

Modern: Cardiac Poison [2]

**1. Description of Plant:** Tobacco is grown all over India but the plant itself is native of America. The two main varieties commonly cultivated for commercial tobacco production are *Nicotina tabacum* and *Nicotina rustica*. *Nicotina rustica* (strong tobacco) is particularly a very effective variety of tobacco containing upto nine times the amount of nicotine compared to *N. tabacum* species. The high Nicotine concentration in its leaves makes it useful for producing pesticides. *N. Rustica* is less cultivated species. *Nicotina tabacum*- is widely cultivated in India and in many other countries around the world. These plants cultivated particularly in the plains of India having less rainfall and temperate climate. It is a small plant with large leaves and weak stem. When dried, the leaves turn a golden brown color and thus the name Tamraparna. These dried leaves are used as tobacco in various product for the purpose of both intoxication and therapeutic use [3,4].

- **Active Principles:** Nicotin, Anabasin, Nornicotine the Plant contains active principals which are toxic alkaloids. Nicotine and Anabasin being equally toxic, while Nornicotine is less toxic. All parts of the plant are poisonous except the ripe seeds. It contains toxic alkaloids as the active principal and the highest concentration is in leaves. The dried leaves (Tobacco, Tambaku) contain one to eight percent of nicotine.
- **Nicotine**, an organic compound is the principal alkaloid of tobacco. It is volatile, colorless, bitter, hygroscopic oily, liquid, natural alkaloid. **Nicotine** is highly toxic and is present in all parts of the tobacco plant, particularly in the tobacco leaves which turn brown and resinous upon exposure to air. It has a penetrating disagreeable odor and burning acrid taste. Nicotine is extensively used in horticultural, agricultural work as fertilizers, fumigants, and insecticide sprays [5,6].

- 2. Intoxication:** The dried leaves of tobacco plant (*Nicotiana tabacum*) are consumed as Tobacco (Tambhakhu). Tobacco can be chewed, smoked or used as snuff [7]. It can be consumed in various ways such as sniffing, chewing, smoking or dipping. Smokeless tobacco products like snuff and chewing tobacco, such as Mawa, Pan masala, Gutkha, Khaini, are popular among many people.

The most common method of using tobacco is cigarette smoking. Cigarette contains 60 carcinogens and more than 4000 toxic chemicals. According to the World Health Organization (WHO), there are around 1.1 billion regular smokers worldwide, representing one-third of the global population aged 15 and above [8,9].

Tobacco is highly addictive, even more than cocaine and heroin. It initially stimulates and then suppresses various centers that is spinal and the cerebral centre, autonomic ganglia in the body. Users often depend on tobacco to regulate their emotional responses to everyday life. The consequences of continuous use of tobacco are mood leveling and emotional dependence [10,11].

## II. TYPES OF ABUSE

- 1. Chewing and Snuff:** The use of tobacco products like mava, pan masala, gutka, khaini increases plasma nicotine level and raises the risk of several oral health issues such as oral cancer, gingivitis, decaying, discoloration, loss of teeth and sub mucosal fibrosis.
- 2. Smoking:** People use different methods for smoking- bididi, cigar pipes, cigarette and hookkha. All types of smoking are equally damaging, leading to catastrophic health consequences.

## III. POISONING BY TOBACCO

Poisoning is caused by inhalation, ingestion or by absorption either through intact or broken skin. Tobacco(Nicotine) first stimulates, then depresses, and later paralyzes autonomic ganglia, brain specially mid brain and it paralyzes the skeletal muscles including the diaphragm. It affects the liver, heart and lungs leading to strokes, heart attacks, chronic obstructive pulmonary disease, hypertension and cancer. The effect depends on the time period and quantity of tobacco consumption. **Passive or secondhand smoking** causes hazardous health effects in human beings leading to heart problems, lung cancer, skin disorders and eye infections. Consumption of tobacco is a vital cause of premature death worldwide frequently in developed countries. **Maternal Smoking** can lead to several severe outcomes such as increased risk of spontaneous abortion, increased risk of Placenta previa, fetal death and low birth weight of baby [12, 13, and 14].

Tobacco use in all forms is responsible for preventable deaths yearly, worldwide. The tobacco epidemic is a massive public health threat, leading to more than eight million deaths annually. The numbers are expected to continue rising, with ten million deaths predicted by 2030, with passive smoking being responsible for a significant number of those deaths [15,16,17].

#### IV. AYURVEDA CONCEPT

According to **Ayurveda** the properties of tobacco are akin to those of poison. Tobacco is a Sthavara, Patra Visha. It is not mentioned in Samhitas. It was introduced by Bhavprakasha Nighantu and by Acharya Yogratnakara. They explained Tobacco's therapeutic as well as toxic action in their text. When it is taken in excess amount it produces various hazardous effects like intoxication, giddiness, vomiting, pitta ag-gravation and purgation and diminishes shukra. It's Tik-shna and Pittavardhaka properties are responsible for Mukhapaak. (Sarvsar Roga) which are identified with mouth ulcer, redness and erosion of buccal mucosa and burning sensation of oral mucosa. Being hot it vitiates Pitta, and Rakta.

Sharpness of tobacco impairs the intellect (Buddhi), lightness of the drug poses difficulties in treatment of its poisoning. The drug spreads quickly all over the body (Vyavayi ) and adversely affects the constituents of body i.e. humors (Dosha), tissues (Dhaatu) and wastes (Mala) due to its Vikashee properties. These properties contributed by nicotine are opposite to immunity factor- Ojas. The overdosing or adverse effect like Bhramaka (Induces vertigo), Madakarit (narcotic), Drishtimandyatwa (blindness) have also been noted [18, 19,20].

#### V. SIGNS AND SYMPTOMS OF POISONING



Figure 2

- 1. Mild Poisoning** can occur when tobacco is chewed or smoked for the first time, or when there is inhalation of insecticide spray. Symptoms of mild poisoning include nausea, vomiting, dizziness, perspiration, headache, general weakness, and a slight rise in blood pressure with an increased pulse rate. These symptoms typically subside within a few hours.

2. **Acute Poisoning** occurs when there is absorption of nicotine in poisonous amounts. It is characterized by a burning sensation in the mouth, throat, and stomach which is accompanied by a rapid progression of symptoms seen in mild poisoning. This can lead to convulsions, prostration, irregularities in heart rate, slowing of respiration, and may eventually result in coma. In severe cases death can occur from exhaustion, cardiac arrhythmia, or respiratory failure.
3. **Chronic Poisoning** is the result of continued use of tobacco through chewing, smoking or exposure to nicotine during processing, storage, or insecticide spray. Individuals who chew tobacco may suffer from chronic cough, laryngitis, pharyngitis, and bronchitis. Those who handle tobacco may experience dermatitis. Common symptoms among tobacco users include bad breath, teeth stains, angiospasm, and muscular tremors. Additionally, there may be complications such as blindness, cardiac arrhythmia with extra systole, chest pain resembling angina pectoris and an increased risk of developing cancer in the mouth, tongue, throat, larynx and lungs. Occlusive thromboangiitis obliterans is also common.
4. **The Circumstances of Poisoning - Accidental Poisoning** by tobacco may occur due to excessive smoking, ingestion, or application of leaves or juice to the skin or wounds. Tobacco leaves are sometimes soaked in water and placed in axillae in the bed-time which are then held in position by a bandage and used in cases of malingering. Poisonous symptoms usually become apparent the next morning. Additionally, workers in tobacco factories may also exhibit symptoms of poisoning. Infants of excessively smoking mothers by breast feeding are also at risk of exposure. **Homicidal** and **suicidal** poisoning from tobacco is rare.

The **fatal dose** for nicotine intake is between 40 to 60 milligrams or 15 to 30 grams of crude tobacco. The **fatal period** after intake is usually between 5 to 15 minutes [21,22,23].

## VI. TOBACCO AS ADDICTIVE

It is considered as an intoxicant (Madakari Dravya) as it hinders the normal functions of brain and blocks the intellect (Buddhi).Yogaratnaakara has mentioned its actions like causing intoxication (Mada), giddiness(Bhrama) and increase of Pitta [24].

Tobacco is known to be an addictive substance because it is classified as an intoxicant (Madakari Dravya) that can hinder normal brain functions and block the intellect (Buddhi). The actions of tobacco, such as causing intoxication (Mada), giddiness (Bhrama), and an increase in Pitta, have been mentioned in the Yogaratnakara.

## VII. ADDICTION

Addiction is characterized by a physiological and psychological habit or dependence on a substance that is beyond control. Worldwide tobacco is the most extensively consumed psychotropic drug, increases the risk of non-communicable diseases and becomes a long-term brain disorder that promotes compulsive substance use despite its negative effects. The

overconsumption of various tobacco products such as Tobacco, Kharrha, Gutkha, Khaini, Jarda, Masala Supari, Hookah, Cigarette and Bidi can cause symptoms such as difficulty in swallowing, trouble in mouth opening, lockjaw, and change in voice. However as pain is often absent, these symptoms may get neglected [25,26].

The wide-ranging negative impacts of addiction have serious social consequences and withdrawal from any addictive medication can result in psychosomatic illness [27,28,29].



**Figure 3:** Submucous Fibrosis

Tobacco addiction can block personal, economic, and social development and cause a vicious cycle of physical and mental health hazards, as well as antisocial behavior. Prolonged consumption of nicotine products can cause the development of a white patch in oral cavity called Leukoplakia or submucous fibrosis and if left untreated with continuing nicotine product consumption, can develop into a red patch called erythroplakia, which can eventually turn into a blackish patch known as melanoplakia. This can lead to a non-healing ulcer in the maxillary, oral cavity or mandibular region, chin which may become cancerous [30,31].

Tolerance and physical dependence developed with nicotine use, leads to several withdrawal symptoms when an individual tries to quit or cut down tobacco addiction. These withdrawal symptoms include:

- 1. Withdrawal Symptoms:** Strong will to consume tobacco, Impaired concentration and Memory, Depression, Headache, Muscle cramps, Sleep disturbances, Anxiety, Diaphoresis (excessive sweating) and Rapid respiration, Increased appetite and Weight gain.

To help individuals quit smoking, a common approach is to undergo a short period of maintenance, typically lasting 6 to 12 weeks, followed by a gradual reduction in smoking over the next 6 to 12 weeks. This method helps manage withdrawal symptoms and increase the chances of successfully quitting consumption of tobacco[32,33].

## VIII. DE-ADDICTION

Smoking addiction should be viewed as a chronic medical problem requiring commitment and management skills. The principle of management is similar to that in management of incompatible habituation [Virudha Saatmya] mentioned in Ayurveda.

Accordingly we have to get rid of the bad habit gradually in quarters rather than stopping the habit abruptly. In smoking also it can be employed as reducing the frequency, reducing the dose and practicing something favorable to the body to distract the urge for consumption of tobacco.

**An organized plan for de-addiction includes three phases**

- Assessment
- Intervention
- Follow up

**1. Assessment:** Survey about prevalence and searching for the individuals who want intervention for quitting.

**2. Intervention:** Quitting nicotine addiction can be quite difficult for the addicted. To stop any addiction there should be strong will power. The methods include.

- **Physician's Advice and Counseling**

- Individual
- Group therapy

- **Behavioral training includes being determined and advising tips like**

- Setting a target date.
- Avoid drinks containing caffeine as it adds up to the desire for nicotine
- Involving in other activities that will be helpful for distraction from addiction.
- Exercise to gain more energy and preventing from putting on more weight
- Healthy eating with snacks of raw vegetables and plenty of water.
- Whenever the urge for consuming tobacco is too strong, take a few deep, slow breaths and also stay away from friends who have addiction.
- Training to wipe out negative feelings and inter personal conflicts.
- Nicotine replacement therapy likes Nicotine chewing gum and transdermal patches.
- Yogic respiratory exercises [Praanaayama]
- Hypnosis and acupuncture therapy can be applied.
- Meditating and doing yoga regularly helps in relaxing mind.

## **IX. AYURVEDA MANAGEMENT**

**1. Sadvritta:** This involves adopting simple moral principles and right conduct. By practicing good behavior, individuals can maintain a balanced and healthy lifestyle.

**2. Achara Rasayana:** Achara refers to behavior and Rasayana means rejuvenation. The combination of these two concepts results in the rejuvenation of both the body and mind. It emphasizes on following positive behavioral patterns to promote overall wellness.

**3. Satvavajay Chikitsa:** This form of treatment plays a vital role in preventing Pragyaparadha, which refers to errors in perception.

By adopting an Ayurvedic lifestyle, which includes following daily and seasonal regimens, individuals can promote mental well-being. Acharya Charaka recommended measures such as inculcating morals, practicing meditation, and consuming a nutritious diet to overcome dependency.

4. **Padanshika Krama:** Charaka recommended adopting Padanshika Krama, which involves gradually reducing the quantity of addictive substances to avoid strong withdrawal symptoms.
5. **Panchakarma:** Panchakarma is a set of therapeutic measures in Ayurveda that help eliminate toxins from the body. These measures can be beneficial in the treatment of addiction.
6. **Medications:** Alongside lifestyle and therapeutic measures, there are certain herbal remedies that can aid in **de-addiction** and the treatment of withdrawal symptoms[34,35,36,37]
7. **Herbs:** Mandukparni (Centella asiatica Linn), Bramhi (Bacopa monnieri Linn), Ashwagandha (Withania Somnifera Linn), Shankhpushpi (Convolvulus Pluricaulis), Guduchi (Tinospora cordifolia), Jyotishmati (Celastrus paniculatus), Sarpagandha (Raulfia serpentina Linn), Shunthi (Zingiber officinale), Ajvain (Trachyspermum ammi), Maricha (Piper nigrum)
8. **Ayurveda Formulations:** Agnitundirasa, Yograjguggulu, Hingwashtak Churna, Ashvagandha churna, Triphaladi gandusha, Dashmooladi Kwath,

## X. AYURVEDA REMEDY

Consumption of triphala every day before going to bed, eliminate the deposited nicotine tar. Consumption of a measured mixture of Ashwagandha, Bala, shatavari and ginseng everyday and taking chyawanprash help in detoxification. Consume a teaspoon of Ajwain, results in reducing the effect of intake nicotine. Consumption of Cinnamon helps rid of tobacco addiction. Taking 2-3 Basil leaves every morning, will reduce the ill-effects and also reduces the effect of tobacco addiction. Keeping a mixture of Sitopaladi powder, Amalaki, Ginger and Turmeric in the mouth can stop cigarette cravings [38, 39].

1. **Follow up :** Not as a failure, but as a cyclic process of cessation and giving support to those who had successfully quit.
2. **To Deal with Relapses:** Referring to de-addiction centers

## XI. PREVENTION

Social, political, and cultural sources play active role in reducing social acceptability of smoking and increasing the concern about health consequences of active and passive smoking. Physician should advocate for increasing tobacco excise tax, eliminating all tobacco



advertisements and banning smoking in public places. Implementing primary smoking prevention programs in adolescents can be effective.

## **XII. CONCLUSION**

Comprehensive bans on tobacco promotion, advertising, and sponsorship can decrease tobacco consumption. A comprehensive ban covers both direct and indirect forms of promotion.

- 1. Direct Forms:** Comprise advertising on radio television, print publications and social media platforms.
- 2. Indirect Forms:** Include brand stretching, brand sharing, price discounts, free distribution, point of sale product displays, sponsorships and promotional activities

The most cost-effective way to reduce tobacco consumption is increasing the taxes on tobacco. When tobacco users become conscious of the harmful effects of tobacco consumption, they may want to quit. However, nicotine found in tobacco products is highly addictive and only 4% of consumers of tobacco who attempt to quit tobacco use will succeed, without support. It is the duty of every physician and responsible citizen to create awareness about the harmful effects of tobacco consumption. Professional support and proven medications can more than double a chance of successfully quitting tobacco consumption.

With the right form of treatment and by keeping in a positive frame of time, it is definitely possible for tobacco consumer to stick with decision and completely quit tobacco addition.

**“World No Tobacco Day - 31 May celebrated annually - is an opportunity to raise awareness on the harmful and deadly effects of Tobacco” [40].**

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