

# Relationship between Tobacco and Human Immunodeficiency Virus Infection: A Review

## Abstract

It is expected that the adverse effects of tobacco use is associated with more adverse health outcomes. Nicotine dependency and depression are hurdles to tobacco cessation among adolescents and adult smokers. Epigenetic changes lead to depression, schizophrenia and drug addiction. Increase in pain in any form, increases tobacco abuse. The issues faced by males and females and their causes leading to addictions are not always the same. Hence gender based interventions are needed. Counseling for tobacco cessation is imperative for such patients. There is a lack of such a session in the Indian centers where Anti Retroviral Therapy drugs or testing is carried out. Health education is very essential to achieve the desired results. Rather than a simple curative procedure, there is a need to have an “inclusive approach” towards tobacco cessation programmes, with main focus on the rural and the illiterate population. This review highlights a few of the reasons related to tobacco abuse among the Human Immunodeficiency Virus infected patients and the role that a dentist can play in tobacco cessation for these patients.

## Key Words

HIV; tobacco; addiction; emotional stress

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## INTRODUCTION

Health risks are high among HIV positive patients and they accumulate over a period of time. It is expected that the adverse effects of tobacco use is associated with more adverse health outcomes. It is a harbinger for more adverse habits. Nicotine dependency and depression are hurdles to tobacco cessation among adolescents and adult smokers. Peer pressure affects smoking behaviour among adults. For adolescents tobacco cessation programmes should rely upon addressing the psychological factors that push them towards addictions. Due to improper planning and execution, most of the cessation programmes are unsuccessful through the world. Due to shared pathogenicity with HIV, patients are at an increased risk of cardiovascular diseases, peripheral vascular diseases, ischemic stroke, lung and cervical cancer and even osteoporosis.<sup>[1]</sup> Hurley LL *et al.*, have addressed tobacco and alcohol as the two biggest threats to the world. Reasons for addictions include:

1. High availability.
2. Genetic rewarding.
3. Analgesic effect.

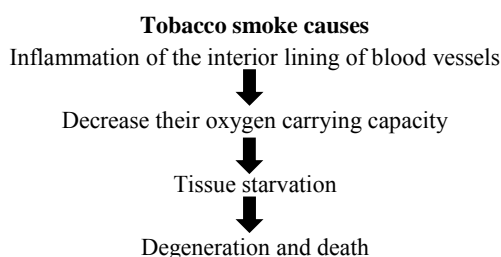
Epigenetic changes lead to depression, schizophrenia and drug addiction. Increase in pain in any form, increases tobacco abuse. Depression can lead to alcohol dependency. Smoking on one hand leads to different health problems and on the other it may increase the individual's choice to drink in order to desire additional pain relief. Both tobacco and alcohol reduce the cognitive capacity of the individual.<sup>[2]</sup> Nahvi S *et al.*, state that the progress achieved in the field of treatment of HIV through the Highly Active Anti Retroviral Therapy drugs, is altered through complications of tobacco smoking like cardiovascular, pulmonary and neoplastic conditions along with infections.<sup>4</sup> The people who smoke have an increased risk to chronic obstructive pulmonary disorder. It is a form of coping mechanism and stress reliever for the patients. Patients from the low socioeconomic status

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**Factors that influence tobacco addiction include<sup>[3]</sup>**


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1. Social support
2. Family environment
3. Occupational functioning
4. Access to health care
5. Level of education
6. Socioeconomic status
7. Social policy




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**Smoking among HIV patients causes<sup>[6]</sup>**


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1. Increased Human papilloma Virus infection
  2. Cell/ organ toxicity- Cytochrome P450 pathways.
  3. Reduced immune response- altering cytokines and chemokines in the lymphocytes
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**Problems and addictions<sup>[7]</sup>**


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1. Employment problems
  2. Psychiatric problems
  3. Family and social problems
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are more prone to smoking.<sup>[4]</sup> Orwat J *et al.*, state that HIV/AIDS individuals have alcohol/ tobacco addictions at large.<sup>[5]</sup>

**What leads to addictions among HIV positive patients?**

Wu LT *et al.*, state that there are gender and ethical differences in addiction severity. The issues faced by males and females and their causes leading to addictions are not always the same. Hence gender based interventions are needed. Ames SL *et al* state that there is a dual interplay of both conscious as well as non conscious mediated process that are supported by interacting neural system leading to irrational decision making such as high risk sexual behaviour inspite of knowing the consequences.<sup>8</sup> Sinha R give the following reasons for stress that ultimately leads to addictions.<sup>[9]</sup>

Reasons for emotional stress

1. Interpersonal conflicts
2. Loss of relationship
3. Death of close family member
4. Loss of a child

Stress they say depends upon:

1. Internal stimuli
2. Personality traits
3. Prior emotional state
4. Specific brain regions that mediate the appraisal of the stimuli as distressing

Brain regions involved in stress<sup>[9]</sup>

1. Amygdala
2. Hippocampus
3. Hypothalamus
4. Thalamus
5. Striatal regions
6. Limbic regions

Reynolds NR,<sup>[10]</sup> Duval X *et al.*,<sup>[11]</sup> state that there is a high prevalence of smoking among the HIV positive individuals. It is 2-3 times higher compared to the general population. Most common factor for smoking is depression.

1. Low socioeconomic status.
2. Psychiatric comorbidity.
3. Physical distress.
4. Lack of proper cessation method

Factors that related to tobacco dependence are:<sup>[11]</sup>

1. HIV disease itself
2. The treatment of the disease that affects compromises the quality of life- side effects of the Anti Retroviral drugs.
3. Attitude of the family and friends that may either start or exacerbate the smoking habit
4. Rejection from social set up.

Carr BA *et al.*, stated that chewing tobacco increases the risk for dental caries due to high sugar content and gingival recession. Tobacco cessations

carried out among HIV positive patients in the dental settings is more successful.<sup>[12]</sup>

#### **Tobacco and the health of HIV positive patients**

Browning KK *et al.*, state that smoking is an important risk factor for lower respiratory tract infections among HIV- infected population.<sup>[13]</sup> Cioe PA *et al.*, state that HIV positive adults are at a greater risk complications than their healthier counterparts.<sup>[14]</sup> Chew D *et al.*, state that there is a high prevalence of tobacco associated mortality and morbidity among HIV positive individuals who smoke.<sup>[15]</sup> Tiwari S *et al.*, have studied and concluded a high prevalence of smoking among HIV positive adults.<sup>[16]</sup> Winstone TA *et al.*, state that HIV positive individuals show a higher rate of addiction. Lung cancer increases with age and this is exaggerated in HIV positive patients. Smoking rates among HIV positive individuals are 3-4 times higher among that of the general population. There is a high human and financial burden due to lung cancer.<sup>[17]</sup>

#### **Role of Dentist**

Since the oral cavity is the domain of the dentist, as a part of the social responsibility, it is imperative on the part of the dentist to impart education to the people especially the vulnerable and the risk group. The active involvement of the dentist in the planning and execution of deaddiction can no more be ignored. It is very necessary that different age groups should be dealt with a different set of approach as far as deaddiction is concerned. Reporting bias is a very common aspect encountered in practice especially while dealing with stubborn patients who are already given up on leading the rest of their life, due to HIV. The training of dentists in social psychology is thus essential.

#### **The 5 A's related to tobacco cessation are:**

1. Ask about tobacco use.
2. Advise to quit.
3. Assess willingness to quit.
4. Assist with quitting.
5. Arrange follow up.

A new dimension to this is anticipation of tobacco risk especially among the adolescents.<sup>[1]</sup> Tobacco abuse among HIV positive individuals leads to a poor health outcome.

#### **Need for Change**

A change in the attitude of the community towards HIV positive patients is essential. There are cases of individuals who live with the infection for a long time and an emotional and mental support to them

will even further prolong their life. Health education is very essential to achieve the desired results. Though it is a slower process with a lot of hurdles still, it is an irreversible process.

#### **Suggestions**

1. Specialized training in cessation programmes for the professionals and the para-professionals including the dentists.
2. Encouragement for subsidized medications for tobacco deaddiction.
3. Clinical trials to test the efficacy of electronic cigarettes and Nicotine replacement therapies especially among the Human Immunodeficiency Virus infected patients.
4. Government policies for tobacco cessation programmes in the form of targeted interventions.
5. Banning the sale of products to teenagers and strict implications of the anti tobacco laws.
6. School health education to make children and adolescents aware of the ill effects of tobacco.

#### **CONCLUSION**

In all the reasons for tobacco addiction among HIV positive patients though is more, still the main reason seems to be the depression that these patients face due to neglect, discrimination, loss of interest, feeling of hopelessness, stress and a suicidal tendency to have a premature death by enjoying life in all the possible aspects with addictions. Counseling for tobacco cessation is imperative for such patients. There is a lack of such a session in the Indian centers where Anti Retroviral Therapy drugs or testing is carried out. The dentist's contribution towards this aspect also needs to be explored. Rather than a simple curative procedure, there is a need to have an "inclusive approach" towards tobacco cessation programmes, with a major focus on the rural and the illiterate population.

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