



**Research Article**

**NICOTINE REPLACEMENT THERAPY FOR TOBACCO CESSATION-AN ELIXIR TO SAVE YOUR LIFE**

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**ABSTRACT**

**Aim-** The aim of the study was to assess the efficacy of nicotine chewing gum in tobacco cessation. **Materials and methods-** The subjects using tobacco in the non-chewable forms were assessed using the Fagerstrom scale. Based on the level of dependency they were prescribed the required dose of Nicotex chewing gum. They were given a tapering dose and analysed over a period of 12 weeks. **Results-** Among the 100 subjects analysed, 52 patients were able to successfully quit the habit, 27 patients were in maintenance phase under observation and 21 patients did not report back. **Conclusion-** Nicotex chewing gum is an effective adjunct that can help the subjects in tobacco cessation along with constant motivation and support.

**Key words:**

Nicotex, fagerstrom Scale

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**INTRODUCTION**

Periodontitis is a chronic inflammatory disease of supporting tissues of teeth caused by specific microorganisms or groups of specific microorganisms, resulting in progressive destruction of the periodontal ligament and alveolar bone. An array of factors is responsible for its progression. Smoking is identified as an independent environmental risk factor for development and progression of periodontal diseases. It is one of the strongest modifiable risk factor. The potential causal relationship between smoking and periodontal disease was identified way back in 1947 by Pindborg<sup>1</sup>.

**History of usage of tobacco**

The cultivation and usage of the tobacco plant, Nicotiana, ages back as early as 5000 BC in America. It was celebrated earlier as a 'holy herb'. The mayan Indians of Mexico mixed herbs and used it as a medicine to cure the sick and wounded. Tobacco smoking became popular in the 19th century with the advent of handmade and machine manufactured cigarette. The first cigarette making machine was invented by James Bonsack in 1881 after which the usage increased dramatically in the 20<sup>th</sup> century.

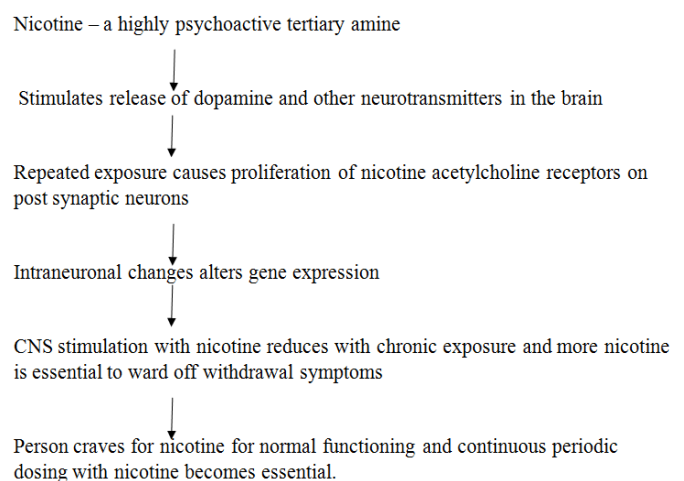
**Nicotine the main constituent of tobacco smoke**

Tobacco smoke contains more than 400 chemical constituents that are toxic, mutagenic and carcinogenic. The United States Surgeons General released a report in 1989 listing 43 carcinogenic agent found in tobacco smoke<sup>2</sup>.

The main alkaloid that is responsible for the addictive potential of tobacco is nicotine. It is the most active compound in smoke and has a half-life of approximately 2-3 hours. It is highly effective as it reaches the brain in 10-20 seconds because of its absorption through pulmonary veins rather than systemic venous system.

It acts on the nicotine acetylcholine receptors and increases the production of several neurotransmitters including dopamine that is responsible for Euphoria, relaxation and finally addiction.

**How Nicotine Causes Addiction?**



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**Incidence and prevalence of tobacco smoking**

According to the Fact sheet published by WHO in May 2017.<sup>3</sup> Tobacco kills up to half of its users. It kills more than 7 million people each year and more than 6 million of those deaths are the result of direct tobacco use while around 8,90,000 are the result of non-smokers being exposed to second-hand smoke.

The last two decades of smoking research have made it clear that cessation of the smoking habit is extremely difficult for most smokers. Part of the problem is that smoking is a complex dependence in which the psychological and pharmacological reinforcements are perfectly confounded.

About 40% of current smokers attempt to quit each year and 4% to 6% are successful. Thus, each year about 2% of smokers quit for good. Most smokers make multiple attempts, such that half eventually quit smoking.

Some believe this is because those who have quit thus far have been the “easy quitters” leaving the more dependent, less psychologically stable, and less advantaged smokers who want to quit but are unable. Two-thirds of self-quitters relapse within 2 days; thus, the major focus of smoking cessation interventions must be in the first few days.

**Nicotine replacement therapy for tobacco cessation**

The last two decades of smoking research have made it clear that cessation of the smoking habit is extremely difficult for most smokers. Part of the problem is that smoking is a complex dependence in which the psychological and pharmacological reinforcements are perfectly confounded.<sup>4</sup> Nicotine replacement therapy (NRT) is a treatment used so as to aid smokers to quit smoking. In this therapy, nicotine present in cigarette is substituted by supplying nicotine in reliable forms such as nicotine gums, nicotine lozenges, and nicotine patches. The treatment assists in reducing withdrawal symptoms linked with smoking cessation, and is therefore helpful in fighting the urge to smoke.<sup>5</sup>

**Nicotine Chewing gum**

The first variety of NRT to become extensively available was chewing gum. The nicotine resin complex is offered in a buffered chewing gum base. These nicotine chewing gums facilitates nicotine to be directly absorbed by the buccal mucosa, which in turn causes a plasma concentration that is roughly half of that produced by smoking a cigarette.<sup>6</sup> The gum is available in various strengths and can be used either after scheduled intervals or can be taken when needed. Decreasing the amount of nicotine gums taken per day (tapering) can be considered in 8 to 12 weeks.<sup>7</sup>

**Aim of the study**

The aim of this study was to assess the efficacy of nicotine chewing gum in tobacco cessation.

**MATERIALS AND METHODS**

The study was done on the patients visiting the Department of periodontics, AJIDS, Mangalore from January 2017 to January 2018. The inclusion criteria were patients aged 18-50 years with the history of smoking and using tobacco in the non-chewable forms.

The exclusion criteria were patients with any systemic disease and patients using betel nut or arecanut chewing. All the

patients went through the 5 A’s protocol that includes, Ask, Advice, Assess, Assist, and Arrange.

In the first visit the patients were asked about the complete history and the Fagerstrom scale was used to assess the nicotine dependency as shown in Figure:1.

**Fagerstrom Test for Nicotine Dependence<sup>8</sup>**

**Figure 1**

PLEASE TICK (✓) ONE BOX FOR EACH QUESTION	
How soon after waking do you smoke your first cigarette?	Within 5 minutes <input type="checkbox"/> 3 5-30 minutes <input type="checkbox"/> 2 31-60 minutes <input type="checkbox"/> 1
Do you find it difficult to refrain from smoking in places where it is forbidden? e.g. Church, Library, etc.	Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 0
Which cigarette would you hate to give up?	The first in the morning <input type="checkbox"/> 1 Any other <input type="checkbox"/> 0
How many cigarettes a day do you smoke?	10 or less <input type="checkbox"/> 0 11 – 20 <input type="checkbox"/> 1 21 – 30 <input type="checkbox"/> 2 31 or more <input type="checkbox"/> 3
Do you smoke more frequently in the morning?	Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 0
Do you smoke even if you are sick in bed most of the day?	Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 0
<b>Total Score</b>	
<b>SCORE</b>	1- 2 = low dependence      5 - 7= moderate dependence 3-4 = low to mod dependence      8 + = high dependence

Nicotex chewing gum was then prescribed to the patient based on the level of dependency. The Nicotex protocol followed is shown in the Figure:2.

**Figure 2**

Dependence level	Nicotine Gum Dosage
High	Nicotine gum-4mg
Moderate	Nicotine gum-4mg
Low to moderate	Nicotine gum-2mg
Low	May not need NRT. Monitor for withdrawal symptoms

The directions to use as prescribed to patient was as follows:

- Nicotine gums are used as chewing gums, they should not be swallowed.
- These gums may be used frequently initially, by chewing one piece of gum in every 1-2 hours for the first 6 weeks. And then can be followed up by chewing only one piece of gum every 2-4 hours for next three weeks, and then just one piece in every 4-8 hours next three weeks.
- Nicotine gum should be chewed slowly until it softens up and begins to get a peppery taste or slight tingling is felt in the mouth.
- As soon as tingling sensation is felt in the mouth patient was advised to stop chewing and place the piece between your gums and cheek and leave it in that place.
- Placement of the nicotine gum in the buccal mucosa is crucial for the absorption of nicotine, failure to do so will lead to more of the nicotine being swallowed which may instigate side effects like nausea and vomiting.
- When gum starts to lose its peppery taste or tingling feel, the patient was asked to chew it again until either peppery taste or the tingling sensation reappears.
- The process can be repeated many times as required, for up to 30 minutes.
- Patient was advised not to eat or drink within 15 minutes before using the gum, or while they are using it.

All the patients were subjected to split mouth ultrasonic scaling in the first visit and recalled after a week to assess, efficacy of nicotine chewing gum on cessation. Complete ultrasonic scaling was performed in the second visit. The

patients were recalled on weekly intervals and motivated in every visit.

**RESULTS**

Among the total of 100 patients included in the study. Each patient was analysed using the Fagerstrom test for nicotine dependence. Patients were categorised into 4 categories based on the scores obtained.

Dependence level	No. of patients
High	48
Moderate	28
Low to moderate	14
Low	10

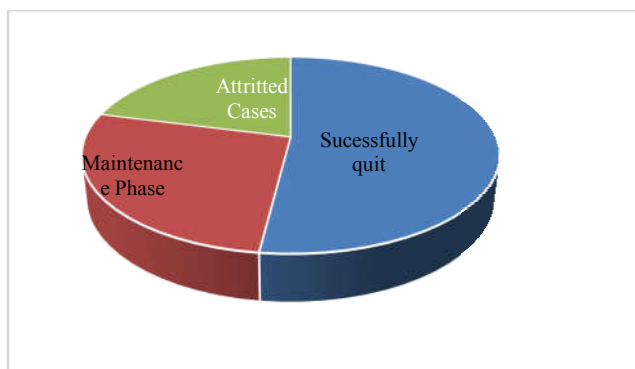
After following the 5 major steps of tobacco intervention, Ask, Advise, Assess, Assist and Arrange, the patients were motivated and then Nicotex chewing gum either 2mg or 4mg was prescribed based on the level of dependency. The following protocol was followed.

**NICOTEX PROTOCOL**

1 Gum / 1-2 hrs	12 gum /day	Week 1
	11 gum /day	Week 2
	10 gum /day	Week 3
	9 gum /day	Week 4
	8 gum /day	Week 5
	7 gum /day	Week 6
1 Gum / 2-4 hrs	6 gum /day	Week 7
	5 gum /day	Week 8
	4 gum /day	Week 9
1 Gum / 4-8 hrs	3 gum /day	Week 10
	2 gum /day	Week 11
	1 gum /day	Week 12

Among the total of 100 patients, 10 patients with low dependency were counselled and motivated in the first few visits. 6 of them quit tobacco without NRT whereas 4 of them were prescribed Nicotex chewing gum that aided in their cessation.

52 patients were able to successfully quit the habit with Nicotex chewing gum, 27 patients were in the maintenance phase and under observation and 21 patients did not report back.



**DISCUSSION**

According to John R. Hughes, one misperception by clinicians, smokers, and non-smokers is “all smokers can quit smoking, if they are just motivated enough.” This statement is similar to statements made about alcohol and depression problems in the early 1900s. We now know that many persons with these problems are able to “self-cure,” but also that many are unable to improve without treatment. The same is true for tobacco use. related statement is that “95% of all smokers who quit do so on their own.” In fact, with all the new treatments, one-third of smokers who quit now do so via treatment.<sup>8</sup>

Some clinicians do not believe brief advice is effective; however, many randomized trials indicate that even brief advice increases quit rates. They also suggest that sparing about 3 minutes to motivate smokers, do play an important role in quitting.

In a study conducted in 1984 on the effect of nicotine chewing gum in smoking cessation. In this study the effect of 2mg nicotine chewing gum as an aid for smoking cessation was analysed. They concluded that Nicotine chewing gum is effective in improving the success rates in smoking cessation.<sup>9</sup> In 2009 a study was conducted on smoking cessation or reduction alongside nicotine replacement therapy, it appraised the efficacy and safety of nicotine gum (4mg) or nicotine inhaler (10mg) in assisting smokers to reduce or quit smoking. The inference of the study was that treatment with 10 mg nicotine inhaler or 4 mg nicotine chewing gum resulted in a significantly higher abstinence rate.<sup>10</sup>

A study conducted in 2011, examined whether providing information to a misinformed person about the innocuous nature of nicotine replacement therapy neutralized the apprehension of a person towards his intentions to use NRT. They concluded from the study that while a substantial number of smokers are still misinformed about the safety of NRT, these misinformed smokers would increase consideration of NRT, if misperceptions are properly addressed.<sup>11</sup>

A systematic review revealed that smokers had approximately 80% higher risk of periodontitis than quitters and never-smokers, corroborating findings from previous meta-analysis.<sup>12</sup> Results from observational studies demonstrated that smoking cessation reduces attachment loss progression<sup>13,14</sup> pocket deepening<sup>15</sup> and radiographic bone loss.<sup>13,14</sup>

Moreover, patients complying with smoking cessation programs along nonsurgical periodontal therapy presented more attachment gain<sup>15</sup> and less deep pockets<sup>16</sup> compared to non-quitters. Even though after smoking cessation tobacco products are quickly eliminated from the organism, tobacco effects on inducing systemic inflammation might last for months or years. For instance, the detrimental effects of smoking on cardiovascular disease and cancer can be seen even 20 years after smoking cessation.<sup>17</sup>

Nicotine replacement therapy can help the patient in the cessation that in turn can help bring about various positive effects on the periodontium. A systematic review suggest that smoking cessation has beneficial effects on the risk for periodontitis and on the response to periodontal therapy already in the first 12 months after quitting smoking.<sup>12</sup>

In India, Tobacco cessation clinics (TCCs) were set up by WHO and Govt. of India to make available tobacco cessation

intervention. 31% of the total registered cases in the initial 5 years were treated with nicotine gums and behavioural counselling. The abstinence rate in counselling group were 15%-17%, whereas abstinence rate in medication group were drastically higher, they were around 53%-60%. Treatment of smoking habit with the help of NRT can be made popular India by providing better knowledge about nicotine gums to smokers, by making NRT accessible and cost effective.

## CONCLUSION

“Giving up smoking is the easiest thing in the world. I know because I’ve done it thousands of times”

-Mark Twain

The most important aspect to smoking cessation is maintaining the motivation to make multiple attempts. Nicotine gums are effective as a part of holistic approach to promote smoking cessation. They increase the odds of quitting substantially. These chewing gums are not a mystical cure for a smoking habit; they rather act as a positive sustenance for nicotine addiction present in smokers. Tobacco cessation can have a positive impact on the general health which in turn can improve the periodontal health and thus be beneficial to the patient in the long run.

## References

1. Pindborg JJ. Tobacco and gingivitis. *Journal of dental research*. 1947 Jun; 26(3):261-4.
2. US Department of health and human services.
3. Tobacco WH. Fact sheet. 2017.
4. Schneider NG, Jarvik ME, Forsythe AB, Read LL, Elliott ML, Schweiger A. Nicotine gum in smoking cessation: a placebo-controlled, double-blind trial. *Addictive behaviors*. 1983 Jan 1;8(3):253-61.
5. Silagy C, Lancaster T, Stead L, Mant D, Flower G. Nicotine replacement therapy for smoking cessation. *Cochrane Database Syst Rev*. 2004;3:CD000146.
6. Russell MA, Feyerabend C, Cole PV. Plasma nicotine levels after cigarette smoking and chewing nicotine gum. *British Medical Journal* 1976; 1:1043-6.
7. William L. Kelemen and Erika K. Fulton. Cigarette Abstinence Impairs Memory and Metacognition Despite Administration of 2 mg Nicotine Gum. *Exp Clin Psychopharmacol*. 2008; 16: 521-31.
8. Fagerström K, Russ C, Yu CR, Yunis C, Foulds J. The Fagerström Test for Nicotine Dependence as a predictor of smoking abstinence: a pooled analysis of varenicline clinical trial data. *Nicotine Tob Res*. 2012;14:1467-73.
9. Hughes JR. Motivating and helping smokers to stop smoking. *Journal of general internal medicine*. 2003 Dec 1; 18(12):1053-7.
10. Hjalmarson AI. Effect of nicotine chewing gum in smoking cessation: A randomized, placebo-controlled, double-blind study. *Jama*. 1984 Nov 23;252(20):2835-8.
11. Kralikova E, Kozak JT, Rasmussen T, Gustavsson G, Le Houezec J. Smoking cessation or reduction with nicotine replacement therapy: a placebo-controlled double blind trial with nicotine gum and inhaler. *BMC Public Health*. 2009 Dec;9(1):433.
12. Ferguson SG, Gitchell JG, Shiffman S, Sembower MA, Rohay JM, Allen J. Providing accurate safety information may increase a smoker's willingness to use nicotine replacement therapy as part of a quit attempt. *Addictive Behaviors*. 2011 Jul 1;36(7):713-6.
13. Leite FRM, Nascimento GG, Scheutz F, López R. Effect of Smoking on Periodontitis: A Systematic Review and Meta-regression. *Am J Prev Med*. 2018;54(6):831-841. doi:10.1016/j.amepre.2018.02.014.
14. Thomson WM, Broadbent JM, Welch D, Beck JD, Poulton R. Cigarette smoking and periodontal disease among 32-year-olds: a prospective study of a representative birth cohort. *J Clin Periodontol*. 2007; 34(10):828-834. doi: 10.1111/j.1600-051X.2007.01131.
15. Gatke D, Holtfreter B, Biffar R, Kocher T. Five-year change of periodontal diseases in the Study of Health in Pomerania (SHIP). *J Clin Periodontol*. 2012;39(4):357-367. doi: 10.1111/j.1600-051X.2011.01849.
16. Okamoto Y, Tsuboi S, Suzuki S, et al. Effects of smoking and drinking habits on the incidence of periodontal disease and tooth loss among Japanese males: a 4-yr longitudinal study. *J Periodontol Res*. 2006; 41(6):560-566. doi: 10.1111/j.1600-0765.2006.0090.
17. Rosa EF, Corraini P, Inoue G, et al. Effect of smoking cessation on non-surgical periodontal therapy: results after 24 months. *J Clin Periodontol*. 2014;41(12):1145-1153.
18. Lowe GD, Yarnell JW, Rumley A, Bainton D, Sweetnam PM. C-reactive protein, fibrin Ddimer, and incident ischemic heart disease in the Speedwell study: are inflammation and fibrin turnover linked in pathogenesis? *ArteriosclerThrombVasc Biol*. 2001;21(4):603-610.

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