Research and Reviews: Journal of Pharmacognosy and Phytochemistry

e-ISSN: 2321-6182
p-ISSN: 2347-2332

Medical uses and Adverse Effects of Nicotine

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Perspective

Received: 24-Nov-2022, Manuscript No. JPRPC- 22- 82511; **Editor assigned:** 29-Nov-2022, PreQC No. JPRPC- 22- 82511 (PQ); **Reviewed:** 14-Dec-2022, QC No JPRPC-22-82511; **Revised:** 21-Dec-2022, Manuscript No. JPRPC-22- 82511 (R); **Published:** 28-Dec-2022 DOI: 10.4172/2321-6182.10.6.003

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DESCRIPTION

The nightshade family of plants, including tobacco and Duboisia hopwoodii, naturally generate the alkaloid nicotine, which is extensively used recreationally as a stimulant and anxiolytic. It is a medicinal substance intended to lessen withdrawal symptoms in those who want to stop smoking. With the exception of two nicotinic receptor subunits (nAChR-9 and nAChR-10), where nicotine functions as a receptor antagonist, nicotine operates as a receptor agonist at the majority of nicotinic acetylcholine receptors. About 0.6-3.0% of the dry weight of tobacco is made up of nicotine. Ppb-concentrations of nicotine are also found in edible members of the *Solanaceae* family, such as potatoes, tomatoes and eggplants though it is debatable whether this has any biological importance for human consumers. Nicotine was previously commonly used as an insecticide due to its harmful effects on antiherbivores.

Neonicotinoids, which have a structure like nicotine and include imidacloprid, are some of the most effective and regularly used poisons. Addiction to nicotine is quite strong. Slow-release medications, such as gums and patches are less addictive and help people stop using tobacco. According to studies on animals, monoamine oxidase inhibitors found in tobacco smoke may make nicotine more addicted. Around 2 mg of nicotine is absorbed from one cigarette on average. Smokers who are not under any restrictions only experience moderate nicotine withdrawal symptoms when their blood nicotine levels reach their peak after each cigarette. When you stop smoking, withdrawal symptoms get a lot worse before slowly getting better and returning to normal. There is a solid safety record for the use of nicotine as a smoking cessation aid. Studies on animals suggest that nicotine may have a negative impact on adolescent cognitive development but it is debatable whether these results apply to human

brain development. It has a modest analgesic effect when used in small doses. Nicotine is not widely recognized to be a carcinogen, according to the International Agency for Research on Cancer. Nicotine is a teratogen since it has been found to cause birth abnormalities in people. Nicotine's median fatal dose in humans is unknown. Although serious or fatal overdoses are uncommon, high amounts of nicotine have been documented to result in organ failure, nicotine poisoning and death by paralysis of the breathing muscles. Nicotine is mostly used therapeutically to treat nicotine dependence in order to cease smoking and the harm it does to one's health. To help patients wean themselves off their dependence, controlled doses of nicotine are administered using gum, dermal patches, lozenges, inhalers or nasal sprays. Combining nicotine patch use with a faster acting nicotine replacement, like gum or spray, improves the likelihood of treatment success. Additionally, 4 mg of nicotine gum instead of 2 mg improves the likelihood of success. It is considered poison to use nicotine. At the dosages that consumers take, it does not pose a significant risk to the user. Numerous of them also appeared often in the nicotine-free placebo group. Even in those with pre-existing cardiac disease, there was no evidence of a higher rate of major cardiac issues compared to the placebo group and palpitations and chest pain were labeled as "rare" symptoms and it lists the typical negative effects of nicotine exposure. It is extremely rare for nicotine replacement therapy to cause serious side outcomes. In healthy nonsmokers given nicotine *via* a transdermal patch, nicotine decreases the quantity of Rapid Eye Movement (REM), Slow-Wave Sleep (SWS) and overall sleep time and the decrease is dose-dependent. Acute nicotine poisoning has been shown to drastically shorten the amount of time spent sleeping overall while lengthening REM, sleep onset and NREM stage 2 sleep.

The mood and sleep of depressive nonsmokers improve when nicotine is administered, but mood and sleep are negatively impacted by subsequent Addiction to nicotine is quite strong. Monoamine oxidase inhibitors in tobacco smoke may increase its addictiveness, according to animal studies. Smokers who regularly stop smoking between cigarettes experience moderate but palpable nicotine withdrawal symptoms. Among them include mildly reduced mood, stress, anxiety, cognition, and sleep, all of which momentarily go better with the next smoke. Smokers enjoy normal moods only right after they have smoked; otherwise, they would not be nicotine-dependent. For smokers, nicotine dependency is linked to lower sleep duration and poorer sleep quality. When inhaled or injected often or at high dosages, nicotine activates the mesolimbic pathway and induces long-term FosB expression in the nucleus accumbens but not always when consumed. Since FosB is overexpressed in the nucleus accumbens, high daily exposure to nicotine can lead to nicotine addiction. Nicotine is thought to be a potential teratogen in humans since it has been demonstrated to cause birth abnormalities in some animal species but not others. Researchers discovered that nicotine adversely affects foetal brain development and pregnancy outcomes in animal tests that resulted in birth defects the adverse effects on early brain development are connected with anomalies in brain metabolism and neurotransmitter system function. Mothers who smoke and women exposed to passive smoking both produce breast milk with nicotine, which crosses the placenta.