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ELECTRONIC CIGARETTES: A SILENT THREAT TO HEALTH, NARRATIVE REVIEW

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INTRODUCTION

Electronic cigarettes were initially promoted as a healthier alternative to smoking, attracting young people in particular. However, this idea ignores the significant health risks of these devices.

THEORETICAL BACKGROUND

Initially, the consumption of electronic cigarettes emerged as an alternative to smoking and to users trying to quit the habit, preaching that the use of these devices is a healthier alternative, since, as they are based on "water vapor" and not on combustion, they would cause less harm to the user, as there are no products from this reaction in traditional cigarettes. This proposal of a healthier device, combined with other attractive factors that dissociate the electronic cigarette from the image of the industrial cigarette (such as pleasant smell and taste; more practical smoking; dynamic colors and shapes) has gained popularity especially among teenagers and young adults. However, this idea is false since, as Soneji pointed out in a study carried out in 2017, these devices were not effective in curbing smoking, actually having the opposite effect, showing that E-cigs users were motivated to start smoking by 30.4% compared to only 7.9% of those who had never used the device. In addition, another very important aspect of this subject is the composition, both of the structure of these nicotine delivery devices (due to the compartment in which this e-liquid is kept, which by successive heating releases heavy metals such as nickel, copper, zinc, tin and lead) and the composition of the e-liquid, the substance that when heated gives rise to the "vapor" of these devices. This liquid varies from model to model, but has three primary substances: the solvent (vegetable glycerin, propylene glycol or both), flavorings and nicotine in varying doses; in addition, in varying combinations of solvents and flavors, a wide range of chemicals can be detected, including toxic carbonyl compounds (such as formaldehyde, acetaldehyde, acetone and acrolein), volatile organic compounds such as benzene and toluene, as well as tobacco-specific nitrosamines. Thus, as explained by Chong-Silva, D. it is clear that these compounds cause damage to multiple systems in the user's body, especially due to their widespread diffusion in the tissues: in the central nervous system, the effects are due to neurotoxicity and cholinergic hyperstimulation, just as in conventional cigarettes, which raises concerns about the use of these devices by adolescents, since this can affect the mesolimbic reward system, causing mood swings and neurodevelopmental deficiencies, reduced reflexes, attention deficits and reasoning; in the cardiovascular system, systematic oxidative stress, resulting from the cytotoxicity of flavor additives, presents a risk for the development of cardiovascular diseases, especially due to the increase in resting heart rate, which is a risk factor for heart failure, especially when combined with the already known effects of nicotine, which cause damage to the hemodynamic response capacity of the vascular endothelium and the production of biomarkers, leading to hypertension and increasing the risk of heart attacks and strokes; in the gastrointestinal system, the effects are mainly related to the high levels of heavy metals, such as copper and chromium, causing epigastric pain, vomiting, diarrhea and bleeding, and there are reports relapses of ulcerative colitis; but of all the systems, the most affected is the respiratory system, with alterations present from the oral cavity (with alterations to the cytoskeleton of the gums and remodeling of the extracellular matrix) to the lower airways, where the immediate effects are associated

with a reduction in the exhaled fraction of nitric oxide, an indicator of an early inflammatory effect, even after occasional use, while the effects of regular use include an increase in the permeability of the alveolar epithelium, which leads to an influx of inflammatory cells which can cause lung disorders such as bronchiolitis obliterans, pneumonitis and acute eosinophilic pneumonia, as well as impairing the innate immune response by reducing the production of IgA-type antibodies and causing dysfunction of the phagocytic activity of macrophages (which increases the susceptibility of this organ to infections) and increased levels of mucin (MUC5AC). The perpetuation of these processes contributes to chronic inflammation and the secretion of mediators that cause the destruction of lung tissue. Although there have been no studies into their use in the long and medium term, a diagnosis related to alveolar injury, EVALI (E-cigarette or vaping associated lung injury), has recently been discovered. In addition, the use of these nicotine delivery devices has been associated with asthma exacerbation in both adolescents with chronic asthma and previously healthy adolescents, through studies in which this relationship was demonstrated by the increase in total resistance (R5Hz) and large airway resistance (R20Hz), measured by impulse oscillometry (IOS), after using an electronic cigarette for five minutes, an effect also described for the use of conventional cigarettes, which suggests a potential constrictor action.

CONCLUSION

Studies show that these devices not only fail to help smoking cessation, but also have serious adverse effects, particularly in adolescents.

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