

Roll of N-nitrosamines and Opium in Oesophageal Cancer

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There are substances recognised as carcinogens for SCC, the main ones being nitrosamines or N-nitrosamines, which are potent carcinogens present in nature and result from the reaction of nitrites with primary, secondary, or tertiary amines in an acidic environment. The role of these compounds in the origin of different types of cancers in humans and animals has been reported for decades [1]. Humans have been exposed to these carcinogens mainly through tobacco consumption, where more than 70% of nitrosamines have been identified. Compounds considered to be carcinogenically detected in tobacco are N-nitrosornicotine (NNN), nitrosamine ketone-nicotine (NNK), N-nitrosoanabasine (NAB), and N-nitrosoanatabine derivative (NAT) [2,3].

Foods, mostly cured or smoked meats, pickled or salted vegetables, and beverages (malt, wines, whisky, and beers), are rich in nitrosamines. Nitrite and sodium chloride, used as additives for curing meats, react with the amines in meats to produce nitrosamines, with N-nitrosodimethylamine (NDMA) and N-nitrosopimolidine (NPYR) being the most frequently formed compounds. The high temperatures to which some foods are subjected during cooking increase N-nitrosamines' formation, with frying more significant in generating these compounds than baking and roasting [4].

Population-based studies [5-7] conducted in several regions of the People's Republic of China have looked at the presence of nitrosamines in drinking water and their potential carcinogenic effects. One of these studies [7] found that the 95th percentile average total cancer risk for the main types of nitrosamines found was 4.83×10 .

Some workers are exposed to nitrosamines through their work activities. Research in the UK [8,9] shows that in the British rubber industry, there is an increased risk of developing neoplasms from exposure to these agents. The International Agency for Research on Cancer (IARC) Monographs Working Group [10] has shown that there is sufficient evidence in humans of the carcinogenicity of occupational exposures in the rubber manufacturing industry, with established causal relationships for cancers of the bladder, lung, stomach and leukaemia, multiple myeloma, and non-Hodgkin's lymphoma, as well as suggestions of an increased risk of prostate, oesophageal and laryngeal cancers.

Despite the information and publications that currently exist on nitrosamines, the IARC [10] itself only recognises N'-Nitrosornicotine (NNN) and 4-(N-nitroso-methylamino)-1-(3-pyridyl)-1-butanone (NNK) as carcinogenic to humans and states that these are considered to be Group 1 agents with less than sufficient evidence in humans.

The role of opium is questionable. Mehdi Bakhshaei, *et al.* [11] conducted a study in which they found that opium inhalation is an independent risk factor for cancer of the larynx but not of the oesophagus, with the risk increasing in association with tobacco use. Although little epidemiological research has been done on the relationship between opium and cancers, recent reviews suggest a causal relationship between opium consumption and neoplasms of different sites. The most critical studies on this carcinogen have been carried out in the Islamic Republic of Iran, where, despite being banned since 1955, thousands of consumers are known to ingest or inhale it in three forms: raw, as sukteh, or shireh [11,12].

Bibliography

1. "Information Note Nitrosamine impurities". WHO. World Health Organization, 20 Nov. 2019. Web. 28 Sep. (2022).
2. Gupta, Alpana K., *et al.* "Grass roots approach to control levels of carcinogenic nitrosamines, NNN and NNK in smokeless tobacco products". *Food and Chemical Toxicology: An International Journal published for the British Industrial Biological Research Association* 124 (2019): 359-366.
3. Konstantinou Evangelia., *et al.* "Tobacco-specific nitrosamines: A literature review". *Food and Chemical Toxicology : An International Journal published for the British Industrial Biological Research Association* 118 (2018): 198-203.
4. Andy. "The importance of nitrosamine analysis". AGS ANALITICA. "N.p". "n.d". . Web. 28 Sep. (2022).
5. Li Xiao., *et al.* "Intake of volatile nitrosamines by Chinese residents in different provinces via food and drinking water". *The Science of the Total Environment* 754 (2021): 142121.
6. Zhao Chao., *et al.* "Distribution of N-nitrosamines in drinking water and human urinary excretions in high incidence area of esophageal cancer in Huai'an, China". *Chemosphere* 235 (2019): 288-296.
7. Luo Qiong., *et al.* "Spatial, temporal variability and carcinogenic health risk assessment of nitrosamines in a drinking water system in China". *The Science of the Total Environment* 736 (2020): 139695.
8. Hidajat Mira., *et al.* "Job-exposure matrix for historical exposures to rubber dust, rubber fumes and n-Nitrosamines in the British rubber industry". *Occupational and Environmental Medicine* 76.4 (2019): 259-267.
9. Hidajat Mira., *et al.* "Lifetime cumulative exposure to rubber dust, fumes and N-nitrosamines and non-cancer mortality: a 49-year follow-up of UK rubber factory workers". *Occupational and Environmental Medicine* 77.5 (2020): 316-323.
10. Human Cancer: Know Causes and Prevention by Organ Site. IARC Monographs on The Identification of Carcinogenic Hazards to Humans. World Health Organization, 1 Jul. (2022).
11. Bakhshaei Mehdi., *et al.* "Opium Addiction and Risk of Laryngeal and Esophageal Carcinoma". *Iranian Journal of Otorhinolaryngology* 29.90 (2017): 19-22.
12. Romera Garrido PL. "Epidemiology of oesophageal cancer in public hospitals in the Autonomous Community of Madrid: survival analysis". Diss. U. Complutense de Madrid, (2011).