International Invention of Scientific Journal
ISSN: 2457-0958

Research Paper

Available Online at http://iisj.in/index.php/iisj October, 2018|Volume 02|Issue 10|

Heavy Metals in Unpackaged Tobacco

[1]MSc student Gülcihan Aybike DİLEK, [2]Asst. Prof. Dr. Mümin POLAT

[1]Graduate Student, Mehmet Akif Ersoy University, Institute of Health Sciences
[2]Dr. Lecturer. Üyesi, Mehmet Akif Ersoy University, Faculty of Health Sciences, Burdur / Turkey

[2]Correspondence Author: *mpolat@mehmetakif.edu.tr*

Accepted 2018-08-03, Published 2018-10-08

Abstract:

Every year more than 5 million people lose their lives because of diseases caused by tobacco. That's 14,000 people every day in the whole world, one in every 8 seconds. The increasing use of cigarettes and other tobacco products has reached the level of threatening public health worldwide. Tobacco feature in this case is the first international treaty created to deal with the strategy developed by the tobacco industry and to prevent Framework Convention on Control (FCTC) has been implemented, signed by Turkey. With this contract, it is aimed to control the tobacco epidemic, which is an epidemic disease. At the same time, the World Health Organization is also undertaking a variety of initiatives to tackle tobacco companies' market-building strategies and to control the spread of tobacco use. The increase in cigarette prices in the world and in our country, however, has led to the use of different tobacco products by cigarette addicts. Especially water pipe, e-cigarette comes with the most common use of raw tobacco is wrapped drink. Raw tobacco differs from other tobacco products in that it is presented at the end of its life without having to undergo the necessary fabrication processes. During the fabrication process, the heavy metal, fertilizer, agrochemical, insecticide, pathogen, toxin, etc. on the harvested tobacco. substances are being tried to be purified. Tobacco that has not been fabricated bypasses this process when it is delivered directly to the end-of-life. In addition to the harm caused by tobacco products on human health alone, the harmful effects of heavy metals, fertilizers, agrochemicals, pesticides, pathogens and toxins which can be contained in them are added. Heavy metals such as lead, cadmium and mercury can usually be detected in open tobacco. In other words, it is known that these and similar heavy metals have different and harmful effects on human health during acute and chronic periods. This compilation focuses on the harmful effects of heavy metals, which can be found extensively in open tobacco, to human health and to raise awareness about it in our society.

Key Words: Open Tobacco, Heavy Metal, Public Health

Introduction:

Tobacco addiction, which causes many medical, social, economic and legal problems due to the increasing prevalence in the world and our country, has become an important health problem today. Tobacco use is the most common preventable death cause in the world, and every eight seconds one person loses his life from a tobacco-related illness [(11)]. Drinking tobacco products is seen as an adult habit, but the emotions that young individuals begin to prove their own sense of freedom and independence can continue to depend on tobacco over time. Nicotine dependence has different methods such as smoking, filter, cigar, hookah, chewing, sucking, snuffing, filtered and unfiltered. Cigarettes without filters are produced without tobacco plants' unfiltered or by people using tobacco wrapped in cigarette paper (wrapped tobacco). Deaths caused by tobacco traffic, terror, work accidents, etc. 5 times more than the sum of all deaths. For this reason, the World Health Organization has declared that smoking is the biggest health problem in the world. [(14)]. Tobacco use is at the forefront of public health problems all over the world and especially in developing countries. [(33)]

What is tobacco?

Tobacco is generally one year from the family of solanaceae (solanaceae), and perennial for some species. In the plant system it is in the "nicotiana"

genus of the solanaceae family. There are about 65 species including Nicotiana. Only Nicotiana tabacum and Nicotiana rustica, cigarettes, cigars, pipes, are used in the construction of tobacco products. 90 percent of tobacco produced worldwide is Virginia, Burley and Oriental type tobacco, including Nicotiana tabacum [38]. The field period of tobacco, which is usually a single annual plant, is 80-120 days depending on the climatic conditions. There are many "origins / varieties" adapted to different climate and soil types. Tobacco leaf is the most important and beneficial part of the plant in commercial terms. Chemical structure, shape and size of leaves; and "hand" which expresses the location of the leaf and its origin on the plant [11, 21]. In general, the plant's blossoming is an indication that the conversion of the green leaf to the yellow has started as a technical issue (vitalite). Technical maturity is a sign of time of harvest (crime). Harvesting is done upwards from the lower hand. The harvest of some tobacco varieties is done by cutting it close to the root of the torso [27]. The basic substance in the flesh is the chemical and physical properties of the leaf. The nicotine, total nitrogen and reducing substances present in the chemical structure of the leaf are important in the production of tobacco products. In terms of physical properties of the leaf, its size, shape, thickness of the texture, hygroscopicity, sauce and olfactory feature are understood as the characteristic of burning. The most important feature that distinguishes tobacco from other plants is the nicotine, an organic nitrogenous substance in its leaves. The nicotine synthesized at the root accumulates in the leaves. Nicotine is a potent alkaloid that is enjoyable and habit-forming. The chemistry of the tobacco leaf varies depending on the type, climate and soil structure it is planted, the techniques applied, and the methods applied during the drying. Tobacco is divided into five main groups according to the drying methods: Flue cured, Air cured, Sun cured, Fire cured and Non-Classified Tobaccos (others). Virginia type tobaccos Flue cured; Burley and Maryland types and pneumatic tobaccos Air cured; Oriental or semi-Oriental tobaccos Sun cured; Black-Fat, Hasankeyf and Tömbeki tobaccos are classified as Others [28,34].

What is a Tobacco Product?

"Tobacco product" or "tobacco product" means all products intended for drinking, pulling, sucking, or chewing, made by the use of tobacco leaf as a raw material, either genetically modified or not altered; the manufacture / production of tobacco products / products is generally called "tobacco fabrication" (34). Tobacco is an industrial plant that has been transformed into "processed tobacco / semi-product" and "product / product" through technical stages such as processing and fabrication after "agricultural / Consumption is the most common tobacco cigarette, shredded tobacco products, pipe, cigar, cigarette tobacco products, snuff and chewiness. Today, tobacco products are subjected to various technological processes and then presented to the market by being smoked or made ready for use in different packages [27].

Sprinkled Minced Tobacco Product- Drinking products which are supplied to the market in the package containing the pasta or cigarette paper as well as the tobacco prepared by using the tobacco leaf as a raw material in whole or in part are called "wrapped tobacco products". Here, "makaron" is an empty filter cigarette tube used in rolled tobacco products; "Leaf cigarette paper" refers to the cigarette paper used as a leaf in shredded tobacco [41].

Tobacco Production and Trade- All climatic regions of Turkey, from the 18 th century is very suitable for the production of tobacco, which has become a traditional branch of agriculture. 98 percent of Sun-cured tobacco produced in Turkey while he was sorting Oriental and half are oriental-type tobacco. There are fewer flue cured (Virginia), light-air cured (Burley), Hasankeyf and Tömbeki tobacco production [30]. "Unprocessed tobaccos", which are purchased from manufacturers, are subjected to various procedures at tobacco processing plants with specific criteria and then re-packaged and re-packaged. In Turkey, the condition being treated is sought to be exported tobacco. tobacco production is done as a family business in Turkey, it has contributed to the livelihood of about 800,000 people. In addition, about 15,000 people work in maintenance and machining [12].

Heavy Metals

When human beings began to live on the earth, they were constantly interacting with the environment as much as the day-to-day. Although it causes visible changes in the earth in the last two centuries; this interaction has often been adversely affected by itself [6, 15]. The environment has affected human health as physical, chemical, biological and socio-cultural. In the late 19th and early 20th centuries, the human expectation of life at birth was only found for 50 years. Infant, child and maternal deaths were high compared to the present day and the causes of death were mainly due to bacterial and parasitic diseases (4). However, the industrialization trends that started in the 18th century and gained momentum in the 19th century have become rules for thousands of years, with Western Europe and North America predominantly beginning to change from different

angles. Industrialization and the resulting socio-economic development have prolonged human life and improved the quality of life. Alleviation of premature deaths has resulted in a marked change in disease characteristics with the progress of environmental struggles and medical facilities against bacterial and parasitic diseases (6,7).

The effects of mining activities known to have been done since ancient times on the health of workers in that area are known for a long time. He noted the effects of hypoxanthine lead poisoning. Physicians like Pliny and Galen later talked about various diseases; but the inadequacy of information about diseases and the fact that these diseases are seen in slaves working in heavy and dangerous jobs have not attracted the interest of the society. The relationship between environment and health has been described in the Chinese records dating back to Milton's previous periods; it is known that some problems related to materials such as lead, silver, gold, copper and antimony are defined (4). At the fifteenth and sixteenth centuries, Georgius Agricola (1494-1555) and Paracelsus (1493-1541) drew attention to lung diseases seen in gold and silver mines. Agricola has proposed masks to cover the mouths and noses of workers against those observed in these mines (6). Paracelsus, a chemist and physician, said, "We may want to dig up land and obtain valuable items such as gold and silver, but we should know in advance that there may be health problems as a countermeasure." In his three volumes, "On miners 'sickness and other miner's' diseases", he pointed out the problems related to the lung diseases in miners and the problems caused by the dissolution of these mines. Problems emerging with the industrial revolution are beginning to attract the attention of different professional groups. Edwin Chadwick, a jurist and environmental engineer, noted the link between diseases and environmental conditions; that the disease can be prevented by correcting the environmental conditions. The centuries-old technological developments, the changes in disease characters, and the knowledge gained in medicine and other scientific disciplines have made it clear today that many physical and chemical agents have a clear definition of the concrete relationship to diseases (17).

Cadmium

Cadmium is a transition element with an atomic number of 48, an atomic weight of 112.41 g / mol, a density of 8.7 g / cm3 and is not present in nature alone. The major Cd salts are CdS, CdCl2 and CdSO2. Cd and its compounds are quite poisonous. As it is found in almost all zinc sprouts, zinc is obtained while cadmium is obtained as a by-product [(10, 19)]. Cadmium is present in the form of cadmium sulphate and sulphite, cadmium oxide, cadmium chloride and, in general, as fine particles (less than 10 µmol / L) with zinc, copper and lead minerals. Although the main chemical species is cadmium oxide (CdO) in the atmosphere, other cadmium salts can be found [9]. CdO is formed by the combustion of tobacco, and this substance is biologically active at high levels. Approximately 10% of the CdO drawn into the lungs is in the lungs, while the other 30-40% is calm. Smokers have a 4-5-fold higher Cd level than the non-smokers, and a 2-3-fold higher Cd level in the kidney (10, 19). Considering that the tobacco contains 0.5-3 µg / g cadmium, it is a fact that a person with 20 cigarettes a day will get cadmium in the concentration of 1-6 µg / g. In smokers, a correlation between low Fe level and Cd excess was determined. In women with low blood Fe levels, high Cd absorption was observed. Thus, adequate Fe intake in the body is thought to reduce Cd absorption [(6,7)]

Lead

It is one of the oldest metals in use. Lead is abundant in the country and there are wide industrial uses throughout history. Since antiquity, it has been used extensively, especially in water systems, and the harmful effects due to the lead have begun to be noticed from those days. It is present in metal and compound states in the ecological system and is toxic in all cases [(6,10)]. In 1920, the addition of lead compounds (lead tetraethyl Pb (C2H5) 4) to benzene played an important role in spreading to the ecological system. Today, with the effort to use unleaded gasoline, diffusion is still continuing in this way. It is known that tobacco used in cigarettes contains lead in variable amounts [(7)].

Results:

The increase in cigarette prices in the world and in our country, has led cigarette addicts to use different tobacco products. Especially water pipe, e-cigarette comes with the most common use of raw tobacco is wrapped drink. Raw tobacco differs from other tobacco products in that it is presented for the last time without being subjected to the necessary fabrication processes. During the fabrication process, the heavy metal, fertilizer, agrochemical, insecticide, pathogen, toxin, etc. on the harvested tobacco. substances are being tried to be purified. Tobacco that has not been fabricated is skipped when it is delivered directly to its final consumption. Apart from the harm caused by tobacco products on human health alone, the harmful effects of heavy metals, fertilizers, agrochemicals, pesticides, pathogens and toxins should also be considered.

Heavy tobacco such as lead, cadmium and mercury can be detected in open tobacco. In other words, it is known that these and similar heavy metals have different and harmful effects on human health during acute and chronic periods. This compilation focuses on the harmful effects of heavy metals, which can be found extensively in open tobacco, to human health and to raise awareness about it in our society.

References:

1) Abuşoğlu A (2007): Investigation of Tobacco and Tobacco Products Sector Role and Importance in Turkey's Economy [thesis]. Ankara.
2) Acer S (2008): The European Union and Tobacco Policies in Turkey [thesis]. Ankara.
3) Aksu S (1967): Tobacco Chemistry and Technology, 1st edition, Tekel Institute Publications, Istanbul, pp. 28-52.
4) Ashraf MW (2012): Levels of Heavy Metals in Popular Cigarette Brands and Exposure to These Metals Via Smoking. The Sci World J., 2012.
5) Ataseven Y (2005): Policies for Tobacco in Turkey-EU and A Comparative Analysis [thesis]. Ankara: Ankara University.
6) Bakar C, Daba (2009): Metals and Human Health: The Environmental Health Problem inherited from the Twentieth Century to the Present and the Future. 1. Medical Geology Workshop, Nevşehir, p: 12.
7) De Sousa Viana GF, Garcia KS, Menezes-Filho JA (2011): Assessment of Carcinogenic Heavy Metal Levels in Brazilian Cigarettes. Environ Monit Assess., 181 (1-4), 255-265.
8) Doğruel F, Doğruel AS (2000): Osmanlıdan Günümüze TEKEL, 1st edition, Tekel Publications, Istanbul, pp. 218-222.
9) Fcdwards PP, Sienko MJ (1983): What is a Metal? Int Rev in Phys Chem., 3 (1), 83-137.
10) Galażyn-Sidorczuk M, Brzóska MM, Moniuszko-Jakoniuk, J. (2008): Estimation of Polish Cigarettes Contamination with Cadmium and Lead, and Exposure to Metals via Smoking. Environ Monit Assess., 137 (1-3), 481-493.
11) Silver AH (2009): Tobacco Policies in Turkey, Problems and Solutions Marketing, 1st edition, Association of Tobacco assessor's assessors - Tobacco Foundation Publications, Izmir, pp: 196-231.
12) Gürsoy Naskali E (1997): Tobacco Book, 1st edition. Tekel Publications Bookshop, Istanbul, pp. 17-33.
13) http://www.ntvmsnbc.com/news/364576.asp. So, Little Was Not Sold in the US, Access Date: March 10, 2018
14) http://www.ntvmsnbc.com/news/364576.asp. Smoking is spreading in America. Access Date: April 15, 2018
15) Kabata-Pendiasa (2001): Trace Metals in Soils-a Current Issue in Poland. Acta Uni Wratis., 79, 13-20.
16) Kabata-Pendiasa, Mukherjee AB (2007): Trace Elements from Soil to Human. Springer Science & Business Media.
17) Kahvecioğlu Ö, Kartal G, Güvena, Timur, S (2003): Environmental Effects of Metals-I. Metallurgy Journal, 136, 47-53.
18) Klaassen CD (1996): Heavy Metals and Heavy-Metal Antagonists. The Pharmacol Basis of Ther, 8, 1649-1671.
19) Klaassen CD, Liu J, Diwan BA (2009): Metallothionein Protection of Cadmium Toxicity. Toxicol Appl Pharmacol, 238 (3), 215-220.
20) Koç Y. (2000): Ataturk's Nationalization and Its Nationalization, Today's Privatizations, 1st edition, TURK-IS Publications, Ankara, p: 21.
21) Kuriyama K, Ogawa S, Ohtomo M, Kuroda K, Saito T (1990): U.S. Pat. Patent No. 4,972,855. Washington, DC: U.S. Patent and Trademark Office.
22) Lax K, & Selinus, O (2005): Geochemical Mapping at the Geological Survey of Sweden. GeoScienceWorld, 5 (4), 337-346.
23) Martin M (1998); BASE. Patent No. 5,711,320. Washington, DC: U.S. Patent and Trademark Office. General Secretariat of the 24th National Tobacco Committee (1992): 10th Committee of the National Tobacco Committee, 1st edition. Tekel Publishing, Istanbul, pp. 30-51.
24) Mohapatra P, Preet R, Das D, Satapathy SR, Siddharth S, Choudhuri T, Kundu, CN (2014): Contribution of Heavy Metals to Cigarette Smoke Condensate to Malignant Transformation of Breast Epithelial Cells and Vivo Initiation of Neoplasia Induction of A PI3K-AKT-Nfkb Cascade. Toxicol Appl Pharmacol, 274 (1), 168-179.
25) Mohapatra P, Satapathy SR, Siddharth S, Das D, Nayaka, Kundu CN. (2015): Resveratrol and Curcumin Synergistically Induces Apoptosis in Cigarette Smoke Condensate Transformed Breast Epithelial Cells Through a p21Waf1 / Cip1 Mediated Inhibition of Hh-Gli Signaling. The Int J of Biochem & amp; Cell Bio, 66, 75-84.
26) Nafiz Z (1932): Tobacco Agriculture and Diseases, 1st edition, Cezri Matbaa İstanbul, p: 3-10.

27) Oral N (2006): Capitalism in Turkey Agriculture and Classes, 1st edition. TMMOB ZMO Publication, Ankara, p: 180-206.
28) Otan H, Apti R (1989): Tobacco, 1st edition, ETAEM Publications, Izmir, p.
29) Ozen Stu (2006): Tobacco Control and Examination of Applications in Turkey in the European Union [thesis]. Ankara: TAPDK.
30) Özgüven M, Sekin S, Gurbuz B, Şekeroğlu N, Ayanoglu F, Ekren S. (2005): Tobacco, Medical and Aromatic Plant Production and Trade. Turkey Agricultural Engineering VI. Technical Congress, 1, 481-501.
31) Official Gazette. Cigar and Sigarillo Importation, Determination of the Price and Domestic Marketing Decision on the Principles and Procedures. 16/04/2008: 26849
32) Official Gazette. Regulation on Procedures and Principles for Production Shape, Labeling and Inspection for the Protection of Tobacco Products from Harm. 06/01/2005: 25692
33) Seydioğulları M. Sir Walter Raleigh (2006): Bulletin of Tobacco Experts Association, 75, 24-25.
34) Feben M (1989): Tobacco Fabrikasyonu, 1 st Edition, TEYO Publications, Istanbul, p: 9-33.
35) Tanrıverdi H (1990): Integration of the Turkish Tobacco Policy with the European Community's Common Tobacco Policy [Thesis]. Istanbul: Istanbul University.
36) TAPDK (2004): The Past, Present, Future and Expectations of the Tobacco Industry, 1st edition, TAPDK Publications, Izmir, pp. 15-37.
37) TEKEL YTİTM (1986): Turkey Tütüncülüg and Future, 1st edition, Monopoly Publications, Istanbul, pp: 51-70.
38) Tobacco Platform 14 Nolu Press Release. (1998): The privatization of TEKEL Cigarette Fabrics and the production rights of some TEKEL brands will condemn the revolving millions of tobacco producers. Izmir.
39) Ozen Stu (2006): Investigation of Tobacco Control and practice in Turkey in the European Union. [Thesis]. Ankara.
40) Universal Leaf Tobacco Company Inc. (2008): World Leaf Production Summary. 1, 1-5
41) Universal Leaf Tobacco Company Inc. Supply & Demand. (2007): 1, 1-30
42) World Health Organization, & Research for International Tobacco Control. (2008): WHO Report on The Global Tobacco Epidemic, 2008: The MPOWER Package. World Health Organization.
43) Yilmaz (2006). Investigation of the production region of quality tobacco and hookah use in Turkey. [Thesis]. Ankara.
44) Ziarati P, Mousavi Z, Pashapour S (2017): Analysis of Heavy Metals in Cigarette Tobacco. J Med Discov, 2, 1-6