

Occupational cancer: workers' exposure and occupational carcinogens

Soile Jungewelter, EASOM 2019, 29.08.2019 Riga

I declare no conflict of interest

causes of cancer world wide

34 000 new cases in Finland in 2018

17 Million new cases of cancer world wide in 2018

tabac 30%

nutrition (alcohol!) 30%

chronic infections 20%

occupational etiology 5-8%

environmental pollution 5%

genetics 5%

unknown 5%

occupational cancer

- occupational cancer is caused wholly or partly by exposure to a cancer causing agent (carcinogen) at work, or by a particular set of circumstances at work
- occupational cancers affect mainly respiratory organs, skin or liver
- individual risk of developing a cancer is influenced by a combination of factors:
 - personal habits such as smoking and alcohol consumption
 - genetics
 - personal characteristics such as sex, ethnicity, age, exposure to carcinogens in the environment

what causes occupational cancer?

The International Agency for Research on Cancer (IARC) lists substances which are known or probable causes of workplace cancer, and other possible substances.

- **chemical carcinogens** - a number of chemicals are known to be carcinogenic. These chemicals may occur naturally, such as asbestos, be manufactured like vinyl chloride, or be by-products of industrial processes, for example, polycyclic aromatic hydrocarbons
- **physical carcinogens** - agents such as ionizing and ultraviolet (UV) radiation have the potential to cause cancer. Examples of ionizing radiation include X-rays and alpha, beta and gamma radiation. UV radiation can be divided into a number of bands such as UV-B, UV-C etc., some of which are known to cause skin cancer.
- **biological carcinogens** - some micro-organisms such as viruses have been known to cause cancer, either by damaging cells directly or by decreasing the body's ability to control abnormal cells, for example Hepatitis B, HI viruses etc.
- **certain occupational circumstances** – night shift

history

1775 chimney sweepers scrotum cancer Pott P

1879 Schneeberger – lung cancer Hesse W and Härting FH

1895 aniline colour and bladder cancer Rehn L

1928 benzene and leukaemia Delore P and Borgomano C

1933 asbestos and lung cancer Lynch KM and Smith WA

1965 wood dust and sinonasal adenocarcinoma Acheson ED

1974 vinylchloride and liver angiosarcoma Creech JL and Johnson MN

...

- identifying occupational carcinogens is an important research aim with broad relevance to science and public health
- occupational exposure to carcinogens is a major cause of death and disability worldwide, with an estimated occurrence of 666 000 fatal work-related cancers annually
- knowledge of cancer hazards from occupational exposure supports prevention and surveillance activities, as well as compensation of exposed workers

CAREX (CARcinogen EXposure)

a MS Access database which contains estimates of the numbers of workers occupationally exposed to carcinogens by industry in 15 previous countries of the European Union (exposure data from 1990-1993) and in four of the ten countries that joined the EU in 2004 (exposure data from 1997).

Provides selected exposure data and documented estimates of the number of exposed workers by country, carcinogen, and industry (FIOH).

FINJEM (FINnish Job-Exposure Matrix)

The Finnish Information System on Occupational Exposure was constructed in the 1990s, prompted by the need to translate occupational histories into quantitative estimates of exposure to carcinogens for a census-based epidemiological study on occupational cancer risks (FIOH).

- 32 Million workers in the EU exposed to agents covered by CAREX
- 22 Million workers exposed to IARC Group 1 carcinogens
- solar radiation
environmental tobacco smoke
crystalline silica
diesel exhaust
radon
wood dust
lead
benzene
asbestos
ethylene dibromide

Kauppinen T et al. Occupational exposure to carcinogens in the European Union. *Occup Environ Med.* 2000 Jan;57(1):10-8. PubMed PMID: 10711264; PubMed Central PMCID: PMC1739859.

what countries can do?

- develop regulatory standards and enforce control of the use of known carcinogens in the workplace
- avoid introducing known carcinogens in the workplace
- include occupational cancer in the national list of occupational diseases
- identify workers, workplaces and worksites with exposure to carcinogens
- develop programs for cancer prevention and control in the workplace
- organize registries of occupational exposures to carcinogens and exposed workers
- estimate the national occupational burden of disease from carcinogens