

Occupational cancers in Slovakia.

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- ▶ Occupational cancers (OC) belong to the most severe occupational diseases with the poor prognosis
- ▶ Links between oncological diseases and workplace is described in many types of cancers

- ▶ the proportion of cancer deaths in Britain due to occupational causes is 2% (with an uncertainty ranging from 1 to 5%)¹
 - in United States 4% (range 2 – 8%)²
 - in Sweden 2,6%³
 - in Czech republic during period 1991 – 2004 only 0,12%⁴
- ▶ in Slovakia the number is unknown

1 Rushton L et al. *Br. J Cancer*. 2010; 102 (9): 1428–1437.
2 Doll R, Peto R. *J Natl Cancer Inst.*, 1981, 66 (6): 1191–308.
3 Järvinen B. et al. *Scand J Work Environ Health*, 2013; 39 (1): 106–111.
4 Fenclová Z. et al. *České pracovní lékařství*, 2006; 7 (3):120 – 121.

- ▶ the most frequent OC
 - lung cancer (almost 70%)
 - mesotelioma
 - breast cancer (especially in GB)
 - skin cancer
 - urinary blader cancer

- ▶ the most freqent etiological factors
 - asbestos
 - ionizing radiation
 - aromatic amines
 - polycyclic aromatic hydrocarbons (PAH)
 - mineral oils
 - solar radiation
 - diesel exhaust
 - crystalline silica

- ▶ List of Occupational Diseases in Slovakia

No. Item	Name of Item
5	Disorder of arsenic and it's compounds
7	Disorder of cadmium and it's compounds
9	Disorder of chromium and it's compounds
14	Disorder of benzene and it's compounds
16	Disorder of halogenated hydrocarbons
21	Skin cancer
23	Lung cancer induced by radioactive substances
32	Disorder of beryllium and it's compounds
34-2	Asbestosis conected with lung cancer
46	Cancers induced by chemical carcinogenes in the workplace (which are not metioned in The List of

▶ in Slovakia

▶ The workers are at risk of following carcinogenes in workplace

1. asbestos
2. cytostatic drugs
3. hardwood dust
4. formaldehyde
5. vinylchloride
6. benzene
7. PAH
8. Cr⁶⁺
9. ethyleneoxide

▶ in Slovakia

- the most prevalent type of occupational cancer was lung cancer
- the most cases were founded in East Slovakia⁵

▶ But more detailed analysis was not done.

5 Buchancová J. Pracovní lékařství. 2010; 62 (3):109- 124.

Aim of study

- ▶ to analyse 96 patients with occupational cancer in Department of Occupational Medicine and Clinical Toxicology at the Louis Pasteur University Hospital in Košice
- ▶ following period 1990 - 2017

Aim of study

- ▶ changes in prevalence during following period
- ▶ types of cancers
- ▶ histological type
- ▶ TNM classification
- ▶ past occupations of affected workers
- ▶ etiological factors
- ▶ latency period

Results - trend

- ▶ 3,43 cases per year



Results - diagnosis

Cancer	Number of cases
Lung	89
Leukemia	3
Mesotelioma	1
Paranasal sinuses	1
Hypopharyngx	1
Oral cavity	1

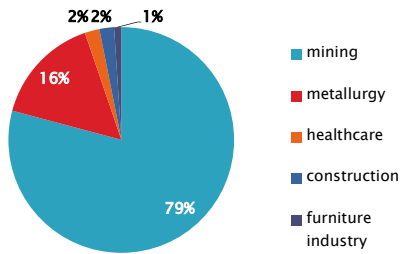
Results - etiological factors

Cancer	Etiological factor	Number
Lungs	Ionizing radiation	69
	PAH	8
	Chromium	2
	Asbestos	1
	SiO ₂	1
AML	Ionizing radiation	1
CML	PAH	1
ALL	Benzene	1
Paranasal sinuses	Hardwood dust	1
Mesotelioma	Asbestos	1
Oral cavity	PAH	1
Hypopharyngx	Asbestos	1

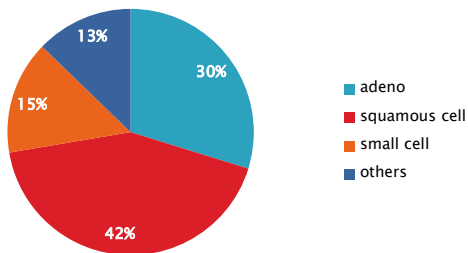
Results

	Patient's age	Exposition (years)	Latency periode (years)
Lungs	63	20	13
Leukemia	46	16	0
Mesotelioma	60	3	15
Hypopharyngx	50	27	12
Oral cavity	56	37	0
Paranasal sinuses	51	29	0

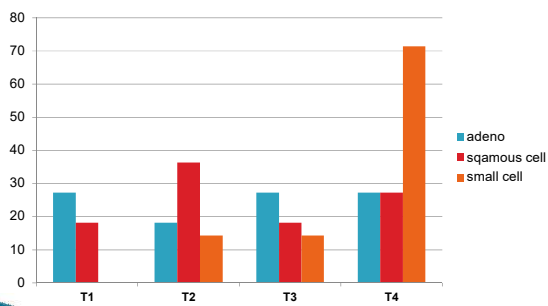
Results – sectores

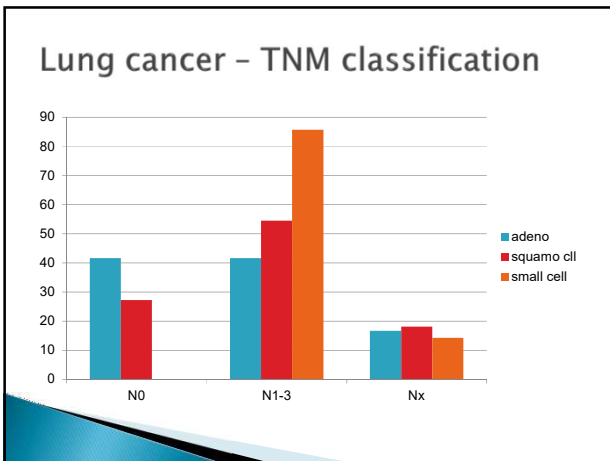


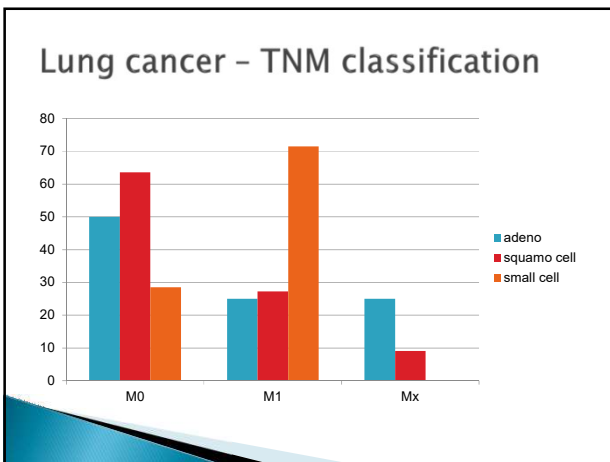
Lung cancer – histological types



Lung cancer – TNM classification







Lung cancer - etiological factors

Histological type	etiological factor	Number (%)
adenocancer	ionizing radiation	36
	PAH	36
	Asbestos	7
	Crystalline silica	7
squamous cell carcinoma	Chromium	14
	ionizing radiation	90
small cell carcinoma	PAH	10
	ionizing radiation	100

Lung cancer – etiological factors

	Ionizing radiation	PAH	T test
Average age	62,22	66	Ns
Length of exposition	20,74	27,13	p=0,063
Latency period	17,04	4	p<0,001

Conclusions

- ▶ Study documented especially lung cancer
- ▶ we founded differences in
 - histological types (the most prevalent was squamous cell cancer)
 - clinical stages (the worst prognosis had the small cell cancer)
 - etiological factors
 - latency period

Conclusions

- ▶ squamous cell carcinoma and small cell carcinoma were induced nearly exclusively by **ionizing radiation**, whereas adenocarcinoma by **heterogeneous factors** – PAH, asbestos, chromium and crystalline silica
- squamous cell carcinoma vs. adenocarcinoma **p<0.05**
- small cell carcinoma vs. adenocarcinoma **p<0.001**

Conclusions

- ▶ The latency period between end of exposition and cancer manifestation was much longer in ionizing radiation compared to PAH ($p < 0,001$)

Conclusions

- ▶ surprising finding
 - **asbestos** was not very important etiological factor
- ▶ the most important etiological factor was the ionizing radiation
 - radon - radioactive gas in iron ore mines
- ▶ asbestos as etiological factor is more important in West Slovakia (asbestos fabric)
 - more mesoteliomas compared to East Slovakia

Conclusions

- ▶ other cancers were rare (insufficient diagnosis?)
- ▶ education and a close cooperation between the occupational physicians with other specialist physicians are necessary.

Thank you for your attention

