EFFECTS OF RESPIRATORY HAZARDS IN GALVANIZING INDUSTRY ON NASAL AND PHARYNGEAL MUCOSA

OVIDIU SAVU¹, DORIN BARDAC²

¹ PhD candidate "Lucian Blaga" University of Sibiu, ² "Lucian Blaga" University of Sibiu

Keywords: respiratory hazards, nasal mucosa, pharyngeal mucosa, electroplating **Abstract:** This paper deals with the Ear, Nose and Throat (ENT) state of health of a group of subjects exposed to occupational hazards within a metal electroplating department within an enterprise in Sibiu. The comparison of the results is made by taking into account the estimates obtained by analyzing the control group, which was similar to the investigated group but whose subjects were daily exposed to zinc, copper, nickel, sulfuric acid and hydrochloric acid.

INTRODUCTION

In the context of the exposure of the organism to various occupational hazards, at ENT level, a number of diseases can occur: chronic rhinitis, hypertrophy of the nasal turbinates, intermittent bleeding and scabs at the level of nasal fossa, ulcerations and perforations in the nasal septum, chronic pharyngitis, dysphonia, altered taste and smell.(1,2)

Each of these symptoms occurs according to the occupational hazard the body has been exposed to, but as well as taking into account the health status of the subject.(3,4)

PURPOSE

In elaborating this study, we started from the premise that human exposure to the toxic working environments can cause occupational or work-related diseases.

Knowing the chronic irritating effects of the occupational hazards on the exposed workers would provide labour medicine physicians, the ENT physicians and the family doctors with the necessary instruments to take the required measures.

The paper evaluates the ENT health status in a group of subjects exposed to occupational hazards within a galvanizing metal department of a company in Sibiu County.

MATERIALS AND METHODS

Clinically and statistically speaking, the study material used in this research to evaluate occupational exposure to specific hazards (to be detailed) comprises two distinct groups of workers.

The groups of patients totalize a number of 200 subjects, divided as follows:

I. A study group represented by 100 male subjects exposed to occupational risk factors, such as cyanides, acid mist, which can harm the ENT health status, and the warm microclimate. The age of the workers is between 28 and 55 years old, with seniority between 1 and 30 years. Seniority in the galvanizing department is between 1 and 20 years.

II. The second group is the control group, which is also made up of 100 subjects, exclusively men who work as laborers in a factory producing sheets of wafers.

Over the years, the workers have been exposed to occupational hazards, specific to the electroplating environment,

such as: sodium cyanide, copper cyanide, zinc cyanide, vapor of hydrochloric acid, sulfuric acid vapors, zinc oxides, wood dust and high temperature.

The workers have not worn specific equipment to protect the airways or the respiratory gate (oral and nasal cavity) represented mainly by face mask, although legislation in force regulated the wear of the protection equipment.

RESULTS AND DISCUSSIONS

After examining the groups of subjects that are similar and homogeneous in terms of age and seniority, we obtained the following results:

From the descriptive analysis, it appears that 63% -65% of the subjects of the studied group, upon the clinical examination, present irritations at the level of nasal fossa, nasal septum, nasal turbinates, oropharynx and at the level of vocal cords compared to only 31% of the control group.

35% of the subjects in the control group present mucosa irritations at same levels (p = 0.000<0.050), as shown in table no. 1.

Table no. 1. Descriptive	analysis o	of the	ENT	irritation	areas
for the two groups of pat	ients				

			Gre	Statistical		
		Study		Control		significance
		No.	%	No.	%	(p)
Presence of	yes	72	63.2%	42	36.8%	
irritation at the level of nasal fossa	no	28	32.6%	58	67.4%	0.000
Presence of	yes	72	64.3%	40	35.7%	
irritation at the level of nasal septum mucosa	no	28	31.8%	60	68.2%	0.000
Presence of	yes	69	63.9%	39	36.1%	
irritation at the level of nasal turbinates	no	31	33.7%	61	66.3%	0.000
Presence of	yes	66	65.3%	35	34.7%	
irritation at the level of oropharynx	no	34	34.3%	65	65.7%	0.000
no	yes	69	68.3%	32	31.7%	0.000
	nu	31	31.3%	68	68.7%	

Dysphonia is especially present in the subjects in the study group, in a percentage of (68.3%), while the number of

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¹Corresponding author: Ovidiu Savu, Str. Gladiolelor, Nr. 13, Bl. 1, Ap. 40, Sibiu, România, E-mail: ovisa_2000@yahoo.com, Phone: +40744 813655

such cases (31.7%) in the control group is significantly lower (p = 0.000 < 0.050) as shown in figure no. 1.

Figure no. 1. Distribution of values regarding the presence of dysphonia in the two groups



Nasal crusts are found in particular in the study group (70.6%), while the number of such cases (29.4%) in the control group was significantly lower (p = 0.001 < 0.050) as shown in figure no. 2.

Analyzing the data, we obtained a percentage of 34.5% of study subjects showing dysphonia and in the control group, there was a percentage of 16% of subjects with dysphonia (p = 0.000 < 0.050).

18% have nasal scabs of those in group 1 compared with the control group where only 7.5% have these crusts in the nasal passages (p = 0.001 < 0.050).

Figure no. 2. Graphic representation of the presence of nasal turbinates hypertrophy



Nasal turbinate hypertrophy has no significant statistical significance, as it occurs in a smilar percentage in both groups, 12.5% in the study group and 10% in the control group (p = 0.249 > 0.050).

The subjects who develop hypertrophy of the nasal turbinates by chronic exposure to the occupational factors mentioned in the paper will claim chronic nasal obstruction, which makes them in time, talking through their nose, breathing through mouth and sometimes snoring during sleep, especially in supine position.

Most of the times, nasal obstruction has an alternative character in one of the nasal fossas, and in the lateral decubitus

position, nasal obstruction is installed in the declive nasal passage.





Intermittent episodes of bleeding in the nasal passages are present in 24% of cases in the study group and in only 5% of cases in the control group, and of these in the study group, 82.8% and in the control group, 17.2%, the difference being considered statistically significant (p = 0.000 < 0.050) as shown in figure no. 4.





CONCLUSIONS

- The most frequent changes occur in the nasal mucosa through irritation, scabs and intermittent bleeding.
- Occupational hazards negatively influence the ENT health status.
- Poor hygiene of the mouth and nasal passages constitute an aggravating factor of the workplace hazards.
- Perforation of the nasal septum no longer appeared in the pathology, in contrast to previous statistics.

REFERENCES

- Dienes A. Etiologia simptomelor în patologia profesională, Litografia U.M.F. Tg. Mureş; 2011.
- Obreja S, Ioniță E, Ioniță I, Mitroi M. Îndreptar terapeutic ORL. Editura Sitech, Craiova; 2010.
- 3. Toma I, et al. Medicina Muncii, Ed. Sitech, Craiova; 2011.
- Bardac DI, Stoia M. Elemente de medicina muncii şi boli profesionale, Editura ULB Sibiu; 2007.

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