

Symposium "Environmental and occupational nasal disorders"

Introduction

Börje Drettner, Huddinge, Sweden



Environmental and occupational factors in medicine have received a greater interest in the last decades than previously. Among other things, it has been suggested that 2/3 of all cancers in the whole body have an environmental origin. Moreover, environmental and occupational factors are definitely of great importance for the nose. Since most of the inspiratory air passes through the nose, the nasal mucosa is exposed to all factors present in the air.

The nose is exposed to extreme variations in *air temperature*. The demands on the nose in the Arctic region and in some freezing industries are considerable, but very high temperatures are also sometimes encountered, e.g. in desert areas and in some occupations. The reserve capacity of the nose to deal with the inspiratory air is very high and the nose usually protects the lower airways from extreme temperatures. As far is known, the question whether long-term environmental and occupational thermal exposure has any effects on the nose has not been fully investigated. It has been an extensive debate as to whether exposure to cold is a predisposing factor for common colds, but only few experimental studies have been undertaken on this subject. Experimental nasal inoculation of viruses in students, sometimes combined with exposure to cold, showed that exposure to cold usually did not seem to have any predisposing effect on the occurrence of common colds, except in women, in whom virus inoculation and exposure to cold during the middle part of the menstrual cycle were associated with more common colds at that time than in the rest of the cycle (Dowling et al., 1958). During experimental exposure of the skin to cold, there is a decrease in body temperature and in the blood flow of the nasal mucosa, but the latter decrease is of short duration and the temperature and blood flow usually increase to the normal levels after a very short time even though the exposure to cold is still continued (Drettner, 1961).

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A correlation between low *air humidity* and disturbed mucociliary transport in the nose has been discussed. Experimentally, such a relationship has been clearly established both *in vitro*, and *in vivo* in the anterior part of the human nose (Mercke, 1974; Ewert, 1965). However, measurements of the mucociliary transport through the whole nasal cavities performed in young students showed that even a very low air humidity of only 10% did not impair the mucociliary transport during an exposure time of 78 hours (Andersen et al., 1974). This is probably due to the great capacity of the glands and goblet cells to produce secretion, which will be sufficient to prevent very low humidity in the nasal cavities.

Barotraumatic disorders are an effect of rapid changes in the ambient air pressure. It is well known that such changes occur mainly in the ear and paranasal sinuses and particularly when the surrounding pressure increases, for example when descending in an aircraft or when going down into water during diving. If the equilibration is not sufficiently good, a relative negative pressure will occur in the sinus and the middle ear, which may cause pain, swelling of the mucosa and even bleeding (Flottes et al., 1960).

Air pollution is very common and has harmful effects not only on the bronchial tree but also on the nasal mucosa. Takahashi (1977) reported that urban children living in polluted areas had more than twice as high a rate of rhinosinusitis than children living in nonpolluted rural areas. The same author found that the incidence of allergy in Japan was related to air pollution and was four times higher in air-polluted regions than in rural, non-polluted ones (Takahashi, 1977). He also reported that there seemed to be a decreasing tendency towards rhinosinusitis in association with improvements in general nutritional conditions and environmental sanitation. However, allergy has appeared to increase in developing countries in connection with urbanisation. Among the different components of air pollution, smoke and smoking are definitely the predominant factors. All efforts made to decrease the incidence of smoking are therefore considered of benefit not only to the smoker but also to the people in his or her vicinity.

This symposium, dealing with environmental and occupational nasal disorders, will focus particularly on two subjects, namely: occupational nasal allergy and industrial nasal problems. With regard to the latter topic, some materials have been investigated to a greater extent than others and will therefore receive special attention; these include nickel, wood dust, plastics, vapours and formaldehyde.

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B. Drettner, M.D.
Dept. of Otolaryngology
Huddinge University Hospital
S-141 86 Huddinge
Sweden