



## **Dry sodium chloride aerosol against acute respiratory infections**

**Alina Chervinskaya**

St.Petersburg, Russian Federation

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**Chairs : D. Inal Ince (Ankara, Turkey), K. Wadell (Umea, Sweden)**

### **Brief description**

In order to study the preventing efficacy of inhaled dry sodium chloride aerosol against acute respiratory viral infection randomized placebo investigation was provided. Dry salt inhalations with Haloneb® inhaler were provided as a preventive method at the industrial plant. The working persons were undertaken by the inhalations twice a week during three month. They had number of cases and days of acute respiratory viral infection and exacerbation of respiratory diseases significantly less in compare with control placebo group. Morbidity with temporary disability was decreased considerably in compare with the ones at the same period of the previous year. Preventive action of dry salt aerosol against respiratory viral infection was proved. Inhalations of dry sodium chloride aerosol, consisting of two weekly procedures are effective preventing method against acute respiratory viral infections.

Finding can be in use for the medical practice application of the dry salt inhalations and the halotherapy.

### **Introduction**

Dry sodium chloride aerosol (DSCA) is the main acting factor of the speleotherapy (salt cave therapy) and halotherapy (therapy in a controlled air medium which saturated with dry salt aerosol). The researches have been directed at examining the action of dry sodium chloride aerosol on respiratory tract of the patients with COPD, asthma and at risk factors of COPD.

DSCA is characterized with physical properties, differing from those of the saline aerosols. DSCA demonstrated anti-inflammatory activity in the respiratory tract, mucoregulating action. It enhances drainage of the bronchi, activates alveolar macrophages, improves biocenosis and local humoral immunity.

## The aim of the study

The main objective was to estimate the preventing efficacy of inhaled dry sodium chloride aerosol (DSCA) against acute respiratory viral infection (ARVI).

## Study design

**Type:** Randomized single-blind placebo study.

Participants: 160 persons were recruited from personnel of an industrial enterprise.

They were randomized in 2 groups - test group (T) (19 male, 61 female, 47.4±8.0 yrs) and control group (C) (22 male, 58 female, 48.8±11.6 yrs).

The groups were comparable as regards age, sex, smoking addiction, exposure to the adverse industrial factors (table 1) and clinical health condition (table2).

## Methods:

- Special questionnaires for the study recruiting
- Physician examination
- Special questionnaires for registration of the symptoms acute respiratory viral infections
- Analysis of official statistical data of the temporary disability participants during the study period from January 25 till April 25, years of 2000 and 2001.

**Table 1. Exposure to industrial pollutants**

	INDUSTRIAL POLLUTANTS						Total	
	galvanic	solder	weld	t <sup>2</sup> change	others	combined	n	%
Group								
T	4	8	1	1	10	5	29	36
C	3	5	1	1	7	1	18	23
Significant differences:							p>0,05	

**Table 2. Clinical characteristics of the participants of the study**

Status	T-group		C-group	
	n	%	n	%
Healthy	17	21	18	22
Risk COPD	34	43	34	43
Chronic Bronchitis	25	31	26	32
Asthma	4	5	2	3
Total:	80		80	

## Intervention

**T-group** was undertaken with 10 min inhalations using a table-mounted Haloneb<sup>®</sup> Salt Inhaler (Aeromed Ltd., Russia) (pic. 1), producing DSCA with particles size mainly of 1-5  $\mu\text{m}$  (pic. 2) and 0.8-1.2 mg/min density flow. Rock salt from Artyomovsk (Ukraine) salt mine was used. The participants inhaled quietly the dry salt aerosol, using a mouthpiece, in the sitting position.

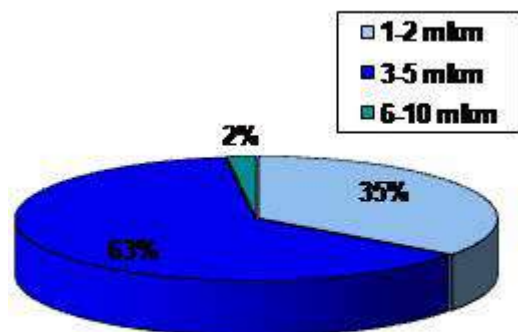
**The C-group** received 10 min inhalations with plain air.

Each subject was given **2 dry salt inhalations a week during 12 weeks**. A physician regularly examined the subjects of the both groups for possible ARVI.

## Haloneb Dry Salt Inhaler



### Fractional composition of dry sodium chloride aerosol, producing by Haloneb

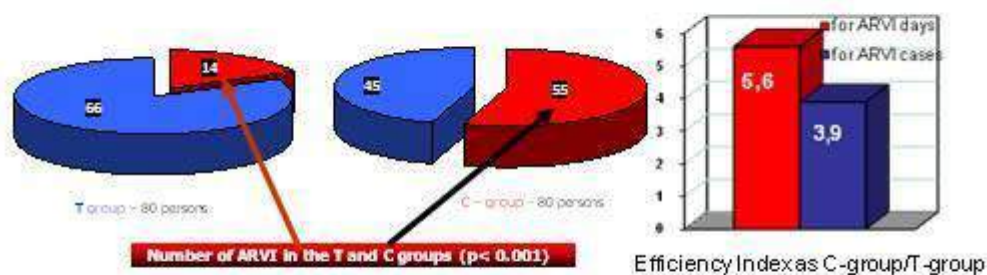


### Outcome

For three months observation there were only 14 cases of ARVI and 104 days marked by symptoms of ARVI in the T-group. In the C-group there were 55 cases of ARVI and 585 days of symptoms. T-group participants were affected by ARVI four times less frequently than C-group participants, and the number of days marked by symptoms of ARVI was 5.6 times less (pic. 3).

Analysis of incidences of ARVI showed that they occurred in 60% of participants with risk factors of COPD in C-group subjects against only 18% of subjects with risk factors in the TG ( $p < 0.01$ ). On the whole, 13 subjects (16%) developed ARVI in the T-group against 50 subjects (63%) in the CG ( $p < 0.001$ ).

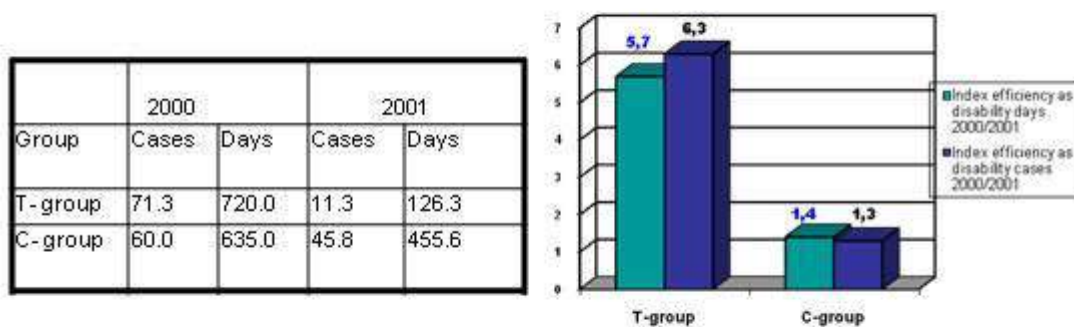
**Pic.3. Influence of dry sodium chloride aerosol on the incidence of acute respiratory viral infections during 3 months term**



Respiratory morbidity with temporary disability in the T-group during 3 months in 2001 was considerably less in compare with the same period in 2000. The number of disability cases and disability days were significantly less in the T-group in compare with the C-group in the 2001.

The analysis of the efficiency index (ratio of the respiratory disease cases and respiratory disease days in 2000 to those in 2001) showed that this index decreased considerably in the T-group (6.3 and 5.7 times, respectively) compared with the C-group (1.3 and 1.4 times, respectively) (pic. 4).

**Pic.4. Respiratory morbidity with temporary disability (per 100 persons) in the groups during 3 months of 2000 and 2001 year**



## Conclusion

Inhalations of dry sodium chloride aerosol, consisting of two weekly procedures are effective preventing method against acute respiratory viral infections.

Finding can be in use for the medical practice application of the dry salt inhalations and the halotherapy.

This approach may be recommended to healthy persons and patients with chronic respiratory diseases prior to or during cold season.

## Key words

Dry sodium chloride aerosol, salt inhalations, halotherapy, respiratory viral infection, prevention