

Ricerche e studi scientifici relative alla camera salina ed alla nebulizzazione del sale

The effect of salt chamber treatment on bronchial hyperresponsiveness in asthmatics J. Hedman¹, T. Hugg², J. Sandell², T. Haahtela³

Background: Randomized controlled trials are needed to evaluate the effects of complementary treatments in asthma. This study assessed the effect of salt chamber treatment as an add-on therapy to low to moderate inhaled steroid therapy in asthma patients with bronchial hyperresponsiveness (BHR).

Methods: After a 2-week baseline period, 32 asthma patients who exhibited BHR in the histamine inhalation challenge were randomized: 17 to 2-week active treatment, during which salt was fed to the room by a salt generator, and 15 to placebo. The salt chamber treatment lasted 40 min and was administered five times a week.

Results: Median provocative dose causing a decrease of 15% in Fev_1 (PD_{15FEV_4}) increased significantly in the active group ($P = 0.047$) but not in the placebo group. The difference in changes between the active and placebo groups was significant ($P = 0.02$). Nine patients (56%) in the active group and two patients (17%) in the placebo group exhibited at least one doubling dose decrease in BHR ($P = 0.040$). Six patients (38%) in the active group and none in the placebo group became non-hyperresponsive ($P = 0.017$). Neither the peak expiratory flow (PEF) values measured just before and after the treatment, nor FEV_1 values measured before the histamine challenges, changed. The reduction in BHR was not caused by changes in the baseline lung function.

Conclusions: Salt chamber treatment reduced bronchial hyperresponsiveness as an add-on therapy in asthmatics with a low to moderate dose of inhaled steroids. The possibility that salt chamber treatment could serve as a complementary therapy to conventional medication cannot be excluded.

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Comparison between direct humidification and nebulization of the respiratory tract at mechanical ventilation: distribution of saline solution studied by gamma camera.

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Department of Anaesthesiology & Intensive Care, Karolinska University Hospital, Stockholm, Sweden.

AIM: To study the effectiveness of this procedure, an intra-individual pilot study comparing the distribution of an instilled radiolabelled saline solution and an inhaled nebulized radiolabelled saline solution was performed using a scintigraphic technique. **BACKGROUND:** In patients treated with mechanical ventilation, we have routinely used instillation of saline solution in the endotracheal tube before suctioning with the aim of softening mucus and facilitating removal of secretions. In our experience, the effectiveness of this procedure is doubtful. It may also have adverse effects. **METHODS:** Nine patients on mechanical ventilation were examined with Single Photon Emission Computed Tomography on the same occasion using both humidification methods. The entire examination was carried out with the patient kept in a constant position in relation to the gamma camera, thereby allowing subtraction of the first registration from the second registration and subsequent evaluation and digital comparison of the two humidification methods. **RESULTS:** Most of the instilled fluid goes to the posterior portion of the right lower pulmonary lobe. Compared with direct instillation, nebulized solution is more uniformly distributed between and within the lungs. With nebulization, distribution is less influenced by gravitation than with instillation. The aerosol reaches the periphery of the lung to a larger extent. **CONCLUSIONS:** Through the use of an aerosol with specific size characteristics, it may be possible to optimize the distribution of a fluid in the respiratory tract and achieve a more homogenous humidification. It is recommended to replicate the study using 25 subjects. Relevance to clinical practice. Direct instillation of saline should not be used with mechanical ventilation.

A controlled trial of long-term inhaled hypertonic saline in patients with cystic fibrosis.

Elkins MR, Robinson M, Rose BR, Harbour C, Moriarty CP, Marks GB, Belousova EG, Xuan W, Bye PT; National Hypertonic Saline in Cystic Fibrosis (NHSCF) Study Group.

Department of Respiratory Medicine, Royal Prince Alfred Hospital, Sydney, Australia.

BACKGROUND: Inhaled hypertonic saline acutely increases mucociliary clearance and, in short-term trials, improves lung function in people with cystic fibrosis. We tested the safety and efficacy of inhaled hypertonic saline in a long-term trial. **METHODS:** In this double-blind, parallel-group trial, 164 patients with stable cystic fibrosis who were at least six years old were randomly assigned to inhale 4 ml of either 7 percent hypertonic saline or 0.9 percent (control) saline twice daily for 48 weeks, with quinine sulfate (0.25 mg per milliliter) added to each solution to mask the taste. A bronchodilator was given before each dose, and other standard therapies were continued during the trial. **RESULTS:** The primary outcome measure, the rate of change (slope) in lung function

(reflected by the forced vital capacity [FVC], forced expiratory volume in one second [FEV1], and forced expiratory flow at 25 to 75 percent of FVC [FEF25-75]) during the 48 weeks of treatment, did not differ significantly between groups ($P=0.79$). However, the absolute difference in lung function between groups was significant ($P=0.03$) when averaged across all post-randomization visits in the 48-week treatment period. As compared with the control group, the hypertonic-saline group had significantly higher FVC (by 82 ml; 95 percent confidence interval, 12 to 153) and FEV1 (by 68 ml; 95 percent confidence interval, 3 to 132) values, but similar FEF25-75 values. The hypertonic-saline group also had significantly fewer pulmonary exacerbations (relative reduction, 56 percent; $P=0.02$) and a significantly higher percentage of patients without exacerbations (76 percent, as compared with 62 percent in the control group; $P=0.03$). Hypertonic saline was not associated with worsening bacterial infection or inflammation. **CONCLUSIONS:** Hypertonic saline preceded by a bronchodilator is an inexpensive, safe, and effective additional therapy for patients with cystic fibrosis. (ClinicalTrials.gov number, NCT00271310.) Copyright 2006 Massachusetts Medical Society.

Effect of inhalation of thermal water on airway inflammation in chronic obstructive pulmonary disease.

Pellegrini M, Fanin D, Nowicki Y, Guarnieri G, Bordin A, Faggian D, Plebani M, Saetta M, Maestrelli P.

Department of Environmental Medicine and Public Health, University of Padova, via Giustiniani, 2 35128 Padova (PD), Italy.

Thermal water inhalations have been traditionally used in the treatment of upper and lower chronic airway diseases. However, the benefit and the mechanism of this treatment have not been properly assessed. To determine whether inhaled salt-bromide-iodine thermal water improves lung function, quality of life and airway inflammation, 39 patients with chronic obstructive pulmonary disease (COPD) were randomly assigned to receive 2-weeks inhalation treatment with thermal water (active, no. = 20) or normal saline (control, no. = 19) in single blind. Lung volumes were measured, Saint George's respiratory questionnaire (SGRQ) was administered and induced sputum was performed before and after treatment. No changes in pre- and post-salbutamol lung volumes was observed after inhalation treatment in both groups. SGRQ score showed a significant improvement in active group compared with control group at the end of the trial. The concentration of total cells in induced sputum increased significantly in both active ($P < 0.05$) and control groups ($P < 0.05$). Inhalation of thermal water induced a small but significant decrease in percentages of sputum neutrophils ($P < 0.01$) and a parallel increase in macrophages ($P < 0.01$). In contrast, normal saline inhalation was not associated with changes in differential sputum cell counts. In conclusion, treatment with inhaled salt-bromide-iodine thermal water in COPD is associated with a reduced proportion of neutrophils in induced sputum suggesting that thermal water may have a mild anti-inflammatory effect on the airways. However, the short-term improvement in some components health-related quality of life was not related with changes in lung function or with the degree of airway inflammation.

Inhaled hyperosmolar agents for bronchiectasis.

Wills P, Greenstone M.

BACKGROUND: Mucus retention in the lungs is a prominent feature of bronchiectasis. The stagnant mucus becomes chronically colonised with bacteria, which elicit a host neutrophilic response. This fails to eliminate the bacteria, and the large concentration of host-derived protease may contribute to the airway damage. The sensation of retained mucus is itself a cause of suffering, and the failure to maintain airway sterility probably contributes to the frequent respiratory infections experienced by many patients. Hypertonic saline inhalation is known to accelerate tracheobronchial clearance in many conditions, probably by inducing a liquid flux into the airway surface, which alters mucus rheology in a way favourable to mucociliary clearance. Inhaled dry powder mannitol has a similar effect. Such agents are an attractive approach to the problem of mucostasis, and deserve further clinical evaluation.

OBJECTIVES: To determine whether inhaled hyperosmolar substances are efficacious in the treatment of bronchiectasis **SEARCH STRATEGY:** The Cochrane Airways Group Specialised Register was searched, and leaders in the field were contacted. Searches were current as of October 2005. Search updates will be run annually.

SELECTION CRITERIA: Any trial using hyperosmolar inhalation in patients with bronchiectasis not caused by cystic fibrosis.

DATA COLLECTION AND ANALYSIS: Two reviewers assessed studies for suitability. **MAIN RESULTS:** Two small studies met the inclusion criteria of the review (28 participants). One study reported tracheobronchial clearance of a particulate radio aerosol after inhalation of dry mannitol on a single occasion, with appropriate control. Airway clearance doubled in the central and intermediate regions of the lung, but not in the peripheral region, after mannitol administration. No side effects were observed, but two patients were premedicated with nedocromil to prevent bronchospasm. Findings from one further trial indicated that one domain of a sensitive health status instrument showed a favourable response to mannitol.

AUTHORS' CONCLUSIONS: Dry powder mannitol has been shown to improve tracheobronchial clearance in bronchiectasis, as well as cystic fibrosis, asthmatics, and normal subjects. Hypertonic saline has not been specifically tested in bronchiectasis, but improves clearance in these other conditions and in chronic bronchitis. The measurement of health status in one of the studies should be repeated in future longer term randomised controlled studies of mannitol and hypertonic saline. Consideration should also be given to exacerbations and symptom scores, as well as drug-related adverse events.

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Halotherapy in combined non-puncture therapy of patients with acute purulent maxillary sinusitis

Grigor'eva NV.

Halotherapy was applied for non-puncture treatment of 45 patients with acute purulent maxillary sinusitis. The response was evaluated by changes in clinico-immunological, cytological, x-ray and bacteriological parameters. Halotherapy was found effective in the treatment of acute purulent maxillary sinusitis without puncture.

Efficacy of therapeutic use of ultrasound and sinusoidal modulated currents combed with halotherapy in patient with occupational toxic-dust bronchitis

Roslaia NA, Likhacheva EI, Shchekoldin PI.

Immunological and cardiorespiratory characteristics were studied in 88 alloy industry workers with occupational toxic-dust bronchitis who received the following therapy: sinusoidal modulated currents (SMC), ultrasound (US) on the chest, halotherapy (HT) (52 patients, group 1); SMC + HT (10 patients, group 2); US + HT (15 patients, group 3); HT (11 patients, group 4). The patients did also therapeutic exercise and were massaged (chest). It was found that device physiotherapy (SMC, US) in combination with HT raise the treatment efficacy to 86.5%. This combined treatment is recommended both for treatment and prevention of obstructive syndrome in toxic-dust bronchitis.

Effects of halotherapy on free radical oxidation in patients with chronic bronchitis]

Farkhutdinov UR, Abdrakhmanova LM, Farkhutdinov RR.

Registration of luminol-dependent chemoluminescence of blood cells and iron-induced chemoluminescence of the serum was used to study generation of active oxygen forms and lipid peroxidation in patients with chronic bronchitis (CB). 49 patients with lingering CB showed inhibition of blood cell function and enhancement of lipid peroxidation. The addition of halotherapy to combined treatment of these patients promoted correction of the disorders and improvement of CB course.

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The scientific validation and outlook for the practical use of halo-aerosol therapy]

Chervinskaia AV.

The paper describes a new medical technique--halo-aerosol therapy, the main acting factor of which is dry highly dispersed aerosol of sodium chloride in natural concentration. Halo-aerosol therapy represents a new trend in aerosol medicine. It includes two methods: halotherapy and halo-inhalation. Biophysical and pathophysiological foundations of the new method, how it can be realized are outlined. Clinical reasons are provided for application of halo-aerosol therapy for prevention, treatment and rehabilitation of patients with respiratory diseases. Characteristics and differences of the two halo-aerosol therapy variants are analysed.

Halotherapy in the combined treatment of chronic bronchitis patients

Maev EZ, Vinogradov NV.

Halotherapy proved to be a highly effective method in a complex sanatorium treatment of patients with chronic bronchitis. Its use promotes more rapid liquidation of clinical manifestations of disease, improves indices of vent function of lungs, especially those values that characterize bronchial conduction (volume of forced exhalations per second, index Tiffno), increases tolerance to physical load, normalizes indices of reduced immunity and leads to increasing the effectiveness of patient treatment in sanatorium.

The use of an artificial microclimate chamber in the treatment of patients with chronic obstructive lung diseases

Chernenkov RA, Chernenkova EA, Zhukov GV.

Halotherapy was used for sanatorium rehabilitation in 29 patients with chronic obstructive pulmonary diseases (chronic bronchitis and asthma). Significant positive effects of this method resulted in the improvement of the flow-volume parameters curve of lung function and in hypotensive effects on blood pressure. Halotherapy is recommended for use in patients suffering from chronic obstructive pulmonary diseases with hypertension or coronary heart disease.

Halotherapy for treatment of respiratory diseases.

Chervinskaya AV, Zilber NA.

Saint-Petersburg Pavlov National Medical University, Russia.

This work elucidates the questions upon the development of a new drug-free method of a respiratory diseases treatment. Halotherapy (HT)--is mode of treatment in a controlled air medium which simulates a natural salt cave microclimate. The main curative factor is dry sodium chloride aerosol with particles of 2 to 5 mkm in size. Particles density (0.5-9 mg/m³) varies with the type of the disease. Other factors are comfortable temperature- humidity regime, the hypobacterial and allergen-free air environment saturated with aeroions. The effect of HT was evaluated in 124 patients (pts) with various types of respiratory diseases. The control group of 15 pts received placebo. HT course consisted of 10-20 daily procedures of 1 hour. HT resulted in improvements of clinical state in the most of patients. The positive dynamics of flow-volume loop parameters and decrease of bronchial resistance measured by bodyplethysmography were observed. The changes in control group parameters after HT were not statistically significant. The specificity of this method is the low concentration and gradual administration of dry sodium chloride aerosol. Data on healing mechanisms of a specific airdispersive environment of sodium chloride while while treatment the respiratory diseases are discussed.

Bronchial hyperreactivity to the inhalation of hypo- and hyperosmolar aerosols and its correction by halotherapy]

Gorbenko PP, Adamova IV, Sinitsyna TM.

18 bronchial asthma (BA) patients (12 with mild and 6 with moderate disease) were examined before and after halotherapy (HT) for airways reactivity using provocative tests with ultrasonic inhalations of purified water (UIPW) and hypertonic salt solution (HSS). Bronchial hyperreactivity (BHR) to UIPW and HSS before treatment occurred in 13 and 11 patients (72 and 69%, respectively). HT reduced BHR in 2/3 and 1/2 of the patients, respectively. In the rest patients BHR was unchanged or increased, being so to UIPW only in patients with atopic asthma in attenuating exacerbation. Clinical efficacy of HT and initial BHR to UIPW correlated ($r = 0.56$; $p < 0.05$). No correlation was found between HT efficacy and initial BHR to HSS.

The use of halotherapy for the rehabilitation of patients with acute bronchitis and a protracted and recurrent course]

Borisenko LV, Chervinskaia AV, Stepanova NG, Luk'ian VS, Goncharova VA, Pokhodzei IV, Krivitskaia VZ, Vishniakova LA, Pokhaznikova MA, Faustova ME, et al.

Halotherapy was used for rehabilitation in 25 patients with acute bronchitis of long-standing and recurrent types. The main therapeutic action was ensured by aerodispersed medium saturated with dry highly dispersed sodium chloride aerosol, the required mass concentration being maintained in the range of 1 to 5 mg/m³. Therapy efficacy was controlled through assessment of clinical, functional, immunological and microbiological findings. Metabolic activity values were taken into consideration as well. Positive dynamics of the function indices in the clinical picture resulted from elimination of pathogenic agents, control of slowly running inflammatory lesions and stimulation of some immune system factors. Favourable changes in metabolic activity were present: normalization of serotonin excretion, marked decrease of unbalance in lipid peroxidation-antioxidant system.

FORCED IONIZATION OF THE INDOOR AIR - AN ADDITIONAL METHOD IN THE TREATMENT OF THE RESPIRATORY DISEASE IN CYSTIC FIBROSIS

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(1)Pediatric Clinic II, University of Medicine and Pharmacy Timisoara, 2Tehno Bionic Buzau, 3CF Center Timisoara, Romania.

The aim of the paper is to check clinically the efficiency of the therapy within chronic respiratory disease in CF by forced ionization of the indoor air with the local device "Salin".

The principle of the method is the forced passing of the air through microcrystal salt deposit plates. This procedure leads to changes of the air composition and quality by salt sublimation. We performed the study within 6 months with two lots of CF children and young people followed up by the CF Center in Timisoara.

Lot I: 10 patients (4 male and 6 female) with their age between 3 and 16 years (average 10,1 years old) to which we applied the air-ionization (living room, bedroom). Lot II, witness: 8 patients (3 male and 5 female) with their age between 5 and 17 years (average 10,1 years old) at which the device worked without the salt plates.

The device worked approximately 8-10 hours/day. All patients followed the proper therapy during this study. We studied the following parameters: the patient's general clinical state by a subjective self-estimation in the young people, respectively the parents' estimation in the pre-school children, clinical examination of the respiratory system and FEV 1 value. We selected both children seriously affected (*Pseudomonas* and/or *Staphylococcus*, bronchiectasis, FEV 1 < 50% etc.) as well as those with a good or satisfactory clinical state (without an associated infection, FEV1 > 50 - 60%).

The results showed significant improvement of the clinical state in the lot that had this treatment: amelioration of the clinical signs of the disease, FEV 1 amelioration with an average of 15%, the subjective feeling of the clinical state improvement noticed by the patients, respectively by their parents. From the therapy beginning no patient showed other acute episodes of the respiratory disease that should require another hospitalization. Comparatively, we did not noticed significant changes of the analyzed parameters in lot 2.

Conclusions:

forced ionization of the indoor air by salt sublimation is an efficient method to treat the respiratory disease in CF; this method is an additional one, it does not exclude classic therapy; it is a natural method of therapy adapted to the living place, so it does not involve any risk; it is a relatively cheap method.

Halotherapy Sum Up

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J. Hedman¹, T. Hugg², J. Sandell², T. Haahtela³

Background: Randomized controlled trials are needed to evaluate the effects of complementary treatments in asthma. This study assessed the effect of salt chamber treatment as an add-on therapy to low to moderate inhaled steroid therapy in asthma patients with bronchial hyperresponsiveness (BHR).

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BACKGROUND: In patients treated with mechanical ventilation, we have routinely used instillation of saline solution in the endotracheal tube before suctioning with the aim of softening mucus and facilitating removal of secretions. In our experience, the effectiveness of this procedure is doubtful. It may also have adverse effects.

METHODS: Nine patients on mechanical ventilation were examined with Single Photon Emission Computed Tomography on the same occasion using both humidification methods. The entire examination was carried out with the patient kept in a constant position in relation to the gamma camera, thereby allowing subtraction of the first registration from the second registration and subsequent evaluation and digital comparison of the two humidification methods.

RESULTS: Most of the instilled fluid goes to the posterior portion of the right lower pulmonary lobe. Compared with direct instillation, nebulized solution is more uniformly distributed between and within the lungs. With nebulization, distribution is less influenced by gravitation than with instillation. The aerosol reaches the periphery of the lung to a larger extent.

CONCLUSIONS: Through the use of an aerosol with specific size characteristics, it may be possible to optimize the distribution of a fluid in the respiratory tract and achieve a more homogenous humidification. It is recommended to replicate the study using 25 subjects. Relevance to clinical practice. Direct instillation of saline should not be used with mechanical ventilation.

Halotherapy in combined non-puncture therapy of patients with acute purulent maxillary sinusitis

Grigor'eva NV.

Halotherapy was applied for non-puncture treatment of 45 patients with acute purulent maxillary sinusitis. The response was evaluated by changes in clinico-immunological, cytological, x-ray and bacteriological parameters. Halotherapy was found effective in the treatment of acute purulent maxillary sinusitis without puncture.

Efficacy of therapeutic use of ultrasound and sinusoidal modulated currents combed with halotherapy in patient with occupational toxic-dust bronchitis

Roslaia NA, Likhacheva EI, Shchekoldin PI.

Immunological and cardiorespiratory characteristics were studied in 88 alloy industry workers with occupational toxic-dust bronchitis who received the following therapy: sinusoidal modulated currents (SMC), ultrasound (US) on the chest, halotherapy (HT) (52 patients, group 1); SMC + HT (10 patients, group 2); US + HT (15 patients, group 3); HT (11 patients, group 4). The patients did also therapeutic exercise and were massaged (chest). It was found that device physiotherapy (SMC, US) in combination with HT raise the treatment efficacy to 86.5%. This combined treatment is recommended both for treatment and prevention of obstructive syndrome in toxic-dust bronchitis.

Effects of halotherapy on free radical oxidation in patients with chronic bronchitis]

Farkhutdinov UR, Abdrakhmanova LM, Farkhutdinov RR.

Registration of luminol-dependent chemoluminescence of blood cells and iron-induced chemoluminescence of the serum was used to study generation of active oxygen forms and lipid peroxidation in patients with chronic bronchitis (CB). 49 patients with lingering CB showed inhibition of blood cell function and enhancement of lipid peroxidation. The addition of halotherapy to combined treatment of these patients promoted correction of the disorders and improvement of CB course.

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The scientific validation and outlook for the practical use of halo-aerosol therapy]

Chervinskaia AV.

The paper describes a new medical technique--halo-aerosol therapy, the main acting factor of which is dry highly dispersed aerosol of sodium chloride in natural concentration. Halo-aerosol therapy represents a new trend in aerosol medicine. It includes two methods: halotherapy and halo-inhalation. Biophysical and pathophysiological foundations of the new method, how it can be realized are outlined. Clinical reasons are provided for application of halo-aerosol therapy for prevention, treatment and rehabilitation of patients with respiratory diseases. Characteristics and differences of the two halo-aerosol therapy variants are analysed.

Halotherapy in the combined treatment of chronic bronchitis patients

Maev EZ, Vinogradov NV.

Halotherapy proved to be a highly effective method in a complex sanatorium treatment of patients with chronic bronchitis. Its use promotes more rapid liquidation of clinical manifestations of disease, improves indices of vent function of lungs, especially those values that characterize bronchial conduction (volume of forced exhalations per second, index Tiffno), increases tolerance to physical load, normalizes indices of reduced immunity and leads to increasing the effectiveness of patient treatment in sanatorium.

The use of an artificial microclimate chamber in the treatment of patients with chronic obstructive lung diseases

Chernenkov RA, Chernenkova EA, Zhukov GV.

Halotherapy was used for sanatorium rehabilitation in 29 patients with chronic obstructive pulmonary diseases (chronic bronchitis and asthma). Significant positive effects of this method resulted in the improvement of the flow-volume parameters curve of lung function and in hypotensive effects on blood pressure. Halotherapy is recommended for use in patients suffering from chronic obstructive pulmonary diseases with hypertension or coronary heart disease.

Halotherapy for treatment of respiratory diseases.

Chervinskaya AV, Zilber NA.

Saint-Petersburg Pavlov National Medical University, Russia.

This work elucidates the questions upon the development of a new drug-free method of a respiratory diseases treatment. Halotherapy (HT)--is mode of treatment in a controlled air medium which simulates a natural salt cave microclimate. The main curative factor is dry sodium chloride aerosol with particles of 2 to 5 mkm in size. Particles density (0.5-9 mg/m³) varies with the type of the disease. Other factors are comfortable temperature- humidity regime, the hypobacterial and allergen-free air environment saturated with aeroions. The effect of HT was evaluated in 124 patients (pts) with various types of respiratory diseases. The control group of 15 pts received placebo. HT course consisted of 10-20 daily procedures of 1 hour. HT resulted in improvements of clinical state in the most of patients. The positive dynamics of flow-volume loop parameters and decrease of bronchial resistance measured by bodyplethysmography were observed. The changes in control group parameters after HT were not statistically significant. The specificity of this method is the low concentration and gradual administration of dry sodium chloride aerosol. Data on healing mechanisms of a specific airdispersive environment of sodium chloride while while treatment the respiratory diseases are discussed.

Bronchial hyperreactivity to the inhalation of hypo- and hyperosmolar aerosols and its correction by halotherapy]

Gorbenko PP, Adamova IV, Sinitsyna TM.

18 bronchial asthma (BA) patients (12 with mild and 6 with moderate disease) were examined before and after halotherapy (HT) for airways reactivity using provocative tests with ultrasonic inhalations of purified water (UIPW) and hypertonic salt solution (HSS). Bronchial hyperreactivity (BHR) to UIPW and HSS before treatment occurred in 13 and 11 patients (72 and 69%, respectively). HT reduced BHR in 2/3 and 1/2 of the patients, respectively. In the rest patients BHR was unchanged or increased, being so to UIPW only in patients with atopic asthma in attenuating exacerbation. Clinical efficacy of HT and initial BHR to UIPW correlated ($r = 0.56$; $p < 0.05$). No correlation was found between HT efficacy and initial BHR to HSS.

The use of halotherapy for the rehabilitation of patients with acute bronchitis and a protracted and recurrent course

Borisenko LV, Chervinskaia AV, Stepanova NG, Luk'ian VS, Goncharova VA, Pokhodzei IV, Krivitskaia VZ, Vishniakova LA, Pokhaznikova MA, Faustova ME, et al.

Halotherapy was used for rehabilitation in 25 patients with acute bronchitis of long-standing and recurrent types. The main therapeutic action was ensured by aerodispersed medium saturated with dry highly dispersed sodium chloride aerosol, the required mass concentration being maintained in the range of 1 to 5 mg/m³. Therapy efficacy was controlled through assessment of clinical, functional, immunological and microbiological findings. Metabolic activity values were taken into consideration as well. Positive dynamics of the function indices in the clinical picture resulted from elimination of pathogenic agents, control of slowly running inflammatory lesions and stimulation of some immune system factors. Favourable changes in metabolic activity were present: normalization of serotonin excretion, marked decrease of unbalance in lipid peroxidation-antioxidant system.

The dynamics of the persistence characteristics of staphylococci under the action of the microclimate of a speleotherapy mine .

A decrease in the persistence characteristics of staphylococci under the influence of microclimate in a spelean pit has been demonstrated under experimental conditions. Clinical investigations have confirmed the capacity of speleotherapy to decrease the microbial contamination of the upper respiratory tract and to inhibit the persistence properties of staphylococcal microflora in children with respiratory allergosis, which seems to be the basis of the positive effect achieved by treatment with microclimate in a spelean pit.

The efficacy of speleotherapy in atopic dermatitis in children

Puryshv EA.

After proper clinical and immunological examinations 112 children with atopic dermatitis underwent immunocorrective speleotherapy in a chamber with artificial microclimate created with the use of natrium chloride spraying. During the treatment positive trends were observed in the patients' dermatological status and immune homeostasis. A complete 6-24-month response was reported in 58%, partial in 20%, no response in 6.9% of patients. The method is recommended for treatment of atopic dermatitis.

The efficacy of speleotherapy in salt mines in children with bronchial asthma based on the data from immediate and late observations *Abdullaev AA, Gadzhiev KM, Eiubova AA.*

Speleotherapy was conducted in 216 children with bronchial asthma treated in conditions of salt mines situated near the town of Nakhichevan. The assessment of clinical, immunological and functional parameters showed that the best results had been achieved in atopic asthma running a light or moderate course. Speleotherapy courses noticeably diminished broncho-obstructive syndrome, improved pulmonary ventilation. The improvement proved stable in the majority of the patients. It is recommended to include speleotherapy in salt mines into combined rehabilitation treatment of pediatric asthmatics.

Values of selected immunological parameters before and after speleotherapy.

Mohapl J, Bohac S, Weigl E. Department of Immunology, Medical Faculty, Palacky University, Olomouc, Czechoslovakia.

Changes of the selected immunological parameters before and after the speleotherapy are studied. It seems, that CIK and Complement parameters can be effected during the treatment in caves while Ig and LSZ parameters did not show any systematic changes. Details are available in the paper.

Effect of the microclimate of salt mines on T- and B-lymphocyte function in bronchial asthma patients *Simionka IuM, Chonka IaV, Pop IL.*

A study of 55 patients with bronchial asthma revealed a reduction of the relative number of T-lymphocytes and their IgA content. The changes were most pronounced in patients during the phase of unstable remission of the disease. Disorders of the T- and B-system of lymphocytes were associated with an increased number of cortisol-resistant lymphocytes. After a course of speleotherapy one could observe an increase of the number of T-lymphocytes and their functional activity, normalization of the number of B-lymphocytes, increase of the level of IgA, reduction of the IgM content and of the relative content of cortisol-resistant lymphocytes fraction.

Speleotherapy: a special kind of climatotherapy, its role in respiratory rehabilitation. *Horvath T.*

Speleotherapy, the use of the climate of caves, is an accepted but not widely known therapeutic measure in the treatment of chronic obstructive airway diseases. This study summarizes the therapeutic experiences of more than 4000 patients who were treated in a 10-year period in a hospital-cave complex in Tapolca, Hungary. A sharp and long-lasting clinical improvement and a significant recovery from airway obstruction could be observed in the overwhelming majority of patients. It is established that the microclimate of some caves can beneficially affect these disorders, but the cave should be considered as an optimal environment for complex respiratory rehabilitation.

Speleotherapy for asthma.

Beamon S, Falkenbach A, Fainburg G, Linde K.2 Morton Street, Royston, Herts., UK, SG8 7AZ.

BACKGROUND: Speleotherapy, the use of subterranean environments, is a therapeutic measure in the treatment of chronic obstructive airways diseases. It is virtually unknown in the UK or the US, but has considerable widespread use in some Central and Eastern European countries.

OBJECTIVES: To review evidence for the efficacy of speleotherapy in the treatment of asthma.

SEARCH STRATEGY: We searched electronic databases (Medline, Embase, Cochrane Airways group database), contacted speleotherapy centres and experts in the field, hand searched proceedings, and checked bibliographies of articles obtained to identify possible relevant publications.

SELECTION CRITERIA: We included controlled clinical trials (i.e., both randomized and those not reporting the method of allocation) that compared clinical effects of speleotherapy with another intervention or no intervention in patients with chronic asthma. **DATA COLLECTION AND ANALYSIS:** Information concerning patients, interventions, results, and methodology were extracted in standardized manner by two independent reviewers and summarized descriptively.

MAIN RESULTS: Three trials including a total of 124 asthmatic children met the inclusion criteria, but only one trial had reasonable methodological quality. Two trials reported that speleotherapy had a beneficial short-term effect on lung function. Other outcomes could not be assessed in a reliable manner. A further search was conducted in July 2000. One further paper was excluded (see excluded studies) **REVIEWER'S CONCLUSIONS:** The available evidence does not permit a reliable conclusion as to whether speleo-therapeutic interventions are effective for the treatment of chronic asthma. Randomized controlled trials with long-term follow-up are necessary.

Use of alternative medicines by allergic patients in Turkey.

- [Kurt E](#), [Bavbek S](#), [Pasaoglu G](#), [Abadoglu O](#), [Misirligil Z](#).

Allergic Diseases Department, Faculty of Medicine, Ankara University, Ankara, Turkey.
emelharm@yahoo.com

BACKGROUND: Although complementary and alternative medicines are frequently used in Turkey, no studies with large series have yet been published. **OBJECTIVE:** Our aim was to determine the prevalences of the use of various types of complementary and alternative medicines in patients with asthma, seasonal allergic rhinitis (SAR) and chronic urticaria (CU) and the relationship between the use of these substances and patients' social, economic and demographic characteristics. **METHODS:** All patients completed a questionnaire about the use of complementary and alternative medicines, including herbal products, animal products, acupuncture, yoga, massage therapies, Turkish-baths, speleotherapy, and psychoreligious methods for curing their diseases. **RESULTS:** The overall use of complementary and alternative medicines was 38 %. The most common alternative therapy treatment was herbal therapy (30.5 %). The prevalence of the use of these therapies was higher in asthmatics than in patients with SAR and CU. In all patients, variables associated with the use of these therapies were older age and having asthma. Among asthmatics, the use of these therapies within the previous 12 months was higher in patients with hospitalization and acute attacks than in those without hospitalization or acute attacks. In this group important covariates in the use of complementary and alternative medicines were older age and severe disease. Approximately half of the patients and 41.2 % of asthmatics discontinued pharmacological therapy during alternative treatment or had not yet started it. **CONCLUSION:** Because of the high prevalence of the use of complementary and alternative medicines and the tendency to discontinue drug therapy during these treatments, patients should be educated about the importance of pharmacological therapies.

Complementary and alternative medicine for bronchial asthma: is there new evidence? [Gyorik SA](#), [Brutsche MH](#).

Division of Respiratory Medicine, University Hospital Basel, Switzerland.

PURPOSE OF REVIEW: Complementary and alternative medicine is widely used in bronchial asthma. Data on efficacy of these treatment modalities are lacking. **RECENT FINDINGS:** Studies published since June 2002 on complementary and alternative medicine in bronchial asthma were systematically reviewed. **SUMMARY:** Studies do not support the use of homeopathy, air ionizers, manual therapy, or acupuncture for asthma. These methods bear some risks to patients related to undertreatment and side effects. There might be a possible, but so far not clearly established, role for antioxidant dietary supplementation, and some natural antiinflammatory and immunomodulatory remedies. However, their effect size compared with the classical treatment and side-effect profile is not clearly established. Strategies influencing breathing technique or perception, such as breathing or retraining exercises, need to be studied over the next few years to establish their additive role in the treatment of asthma. Breathing exercises could improve lung

function and quality of life in different studies. Psychotherapy-related methods such as relaxation, hypnosis, autogenic training, speleotherapy, and biofeedback might have a small effect in selected cases, but have not proven to be superior to placebo. Nevertheless, more randomized controlled trials of good methodological quality are required to allow firm conclusions.

Radon therapy for the treatment of rheumatic diseases--review and meta-analysis of controlled clinical trials. [Falkenbach A](#), [Kovacs J](#), [Franke A](#), [Jorgens K](#), [Ammer K](#).

Gasteiner Heilstollen Hospital, 5645, Bad Gastein-Bockstein, Austria. falke@gasteiner-heilstollen.com

OBJECTIVE: The aim of this study was to analyze the effect of radon therapy on pain in rheumatic diseases. **METHODS:** MEDLINE and MedKur databases were searched for the terms radon plus therapy, rheum, arthritis, and osteo. Radon therapy centers and experts in the field were contacted, proceedings hand-searched, and bibliographies checked for references of potential importance. Included were all prospective randomized controlled clinical trials that compared clinical effects of radon therapy with other interventions in patients with rheumatic diseases and studied pain intensity. Information concerning patients, interventions, results, and methodology were extracted in a standardized manner by all authors independently and summarized descriptively. Reports on pain reduction were pooled for meta-analysis. **RESULTS:** Five clinical trials with a total of 338 patients and comparing the effect on pain of radon baths (three trials) or radon speleotherapy (two trials) with control intervention in degenerative spinal disease (two trials), rheumatoid arthritis (one trial) and ankylosing spondylitis (two trials) met the inclusion criteria. In meta-analysis, the pooled data showed no difference immediately after treatment ($P=0.13$) but significantly better pain reduction in the radon group than the control group at 3 months ($P=0.02$) and 6 months ($P=0.002$) after treatment. **CONCLUSIONS:** The existing trials suggest a positive effect of radon therapy on pain in rheumatic diseases. With respect to the potential clinical effect and given the increasing public interest in radon therapy, there is an urgent need for further randomized controlled clinical investigations with long-term follow-up.

Complementary and alternative medicine in children with asthma.

- [Orhan F](#), [Sekerel BE](#), [Kocabas CN](#), [Sackesen C](#), [Adalioglu G](#), [Tuncer A](#). Hacettepe University, Faculty of Medicine, Department of Pediatric Allergy and Asthma, Ankara, Turkey.

BACKGROUND: The popularity of complementary and alternative medicine (CAM), particularly for chronic conditions such as asthma, is growing rapidly, but little is known about its use in asthmatic children. **OBJECTIVE:** To evaluate the extent, characteristics, and possible predictors of CAM use in a group of Turkish children with asthma. **METHODS:** The parents of asthmatic children were invited to participate in a questionnaire-based survey of 13 worldwide and 5 local methods of CAM. Current asthma treatment, asthma exacerbations, emergency admittances and hospitalizations due to exacerbations, and parental education levels were investigated as predictors that influenced the use of CAM. **RESULTS:** Of the 304 asthmatic children (mean +/- SEM age, 10.5 +/- 0.2 years; range, 1-16 years), 49% ($n = 150$) had used some form of CAM previously, and 38% had used CAM within the previous year. The most popular forms of CAM were quail eggs (79%), herbal medicine (31%), Turkish wild honey (26%), speleotherapy (5%), and royal jelly (5%). The respondents learned about CAM through friends (61%), relatives (25%), the media (9%), and physicians (6%). Age, sex, and mother's and father's education levels were insignificant between the groups that used and did not use CAM ($P = 0.40$, $P = 0.18$, $P = 0.15$, and $P = 0.09$, respectively). The use of regular asthma treatment, the use of inhaled corticosteroids, asthma

exacerbations, emergency admittances, and treatment score were significantly high in the CAM group ($P = 0.006$, $P = 0.03$, $P = 0.008$, $P = 0.02$, and $P = 0.02$, respectively). A significantly high percentage of respondents in the CAM group had considered using CAM for their child's asthma in the future ($P = 0.001$). CONCLUSIONS: Asthmatic children in whom the disease is not well controlled are more likely to use CAM as complementary therapy.

Physical factors in rehabilitation of patients with bronchial asthma
[Barlamov PN](#), [Surovtseva MV](#), [Shutov AA](#), [Shchekotov VV](#).

154 patients with moderate severity bronchial asthma (BA) received treatment including two components: electroaerosols with mineral sodium chloride water (Ust-Kachka resort) (group 1) or ward speleotherapy (group 2), standard antiinflammatory medication with beklametasone dipropionate. (BD). A control group was given BD only. Personality traits and vegetative pattern were studied before and after the treatment. General clinical response was the same in all three groups. Normalization of emotional and vegetative abnormalities was faster in groups where physical factors were employed. These findings show perspectiveness of a new line in the treatment of BA--neurorehabilitation.

Study of molecular damage in bronchial asthma and cerebrovascular disorders during the course of rehabilitation [Vishnevskii AA](#), [Tupeev IR](#), [Toichieva FM](#), [Madraimova MD](#)

Drug treatment of cerebrovascular disorders alone and in combination with UV irradiation of autoblood gave rise to a positive trend in clinical and functional parameters more noticeable in the combined treatment. Also, there was a fall in red cell levels of malonic dialdehyde. A course of speleotherapy given to children with bronchial asthma contributed to normalization of free radical oxidation and reestablishment of molecular structure in red cell membranes.

Speleotherapy for asthma. [Beamon S](#), [Falkenbach A](#), [Fainburg G](#), [Linde K](#).² Morton Street, Royston, Herts., UK, SG8 7AZ.

BACKGROUND: Speleotherapy, the use of subterranean environments, is a therapeutic measure in the treatment of chronic obstructive airways diseases. It is virtually unknown in the UK or the US, but has considerable widespread use in some Central and Eastern European countries.

OBJECTIVES: To review evidence for the efficacy of speleotherapy in the treatment of asthma.

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MAIN RESULTS: Three trials including a total of 124 asthmatic children met the inclusion criteria, but only one trial had reasonable methodological quality. Two trials reported that speleotherapy had a beneficial short-term effect on lung function. Other outcomes could not be assessed in a reliable manner. A further search was conducted in July 2000. One further paper was excluded (see excluded studies) REVIEWER'S CONCLUSIONS: The available evidence does not permit a

reliable conclusion as to whether speleo-therapeutic interventions are effective for the treatment of chronic asthma. Randomized controlled trials with long-term follow-up are necessary.

The dynamics of the persistence characteristics of staphylococci under the action of the microclimate of a speleotherapy mine [Chernova OP](#), [Matiushina SB](#), [Volianik MN](#), [Dimova SG](#), [Kartashova VL](#).

A decrease in the persistence characteristics of staphylococci under the influence of microclimate in a spelean pit has been demonstrated under experimental conditions. Clinical investigations have confirmed the capacity of speleotherapy to decrease the microbial contamination of the upper respiratory tract and to inhibit the persistence properties of staphylococcal microflora in children with respiratory allergosis, which seems to be the basis of the positive effect achieved by treatment with microclimate in a spelean pit.

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The efficacy of speleotherapy in salt mines in children with bronchial asthma based on the data from immediate and late observations [Abdullaev AA](#), [Gadzhiev KM](#), [Eiubova AA](#).

Speleotherapy was conducted in 216 children with bronchial asthma treated in conditions of salt mines situated near the town of Nakhichevan. The assessment of clinical, immunological and functional parameters showed that the best results had been achieved in atopic asthma running a light or moderate course. Speleotherapy courses noticeably diminished broncho-obstructive syndrome, improved pulmonary ventilation. The improvement proved stable in the majority of the patients. It is recommended to include speleotherapy in salt mines into combined rehabilitation treatment of pediatric asthmatics.

Values of selected immunological parameters before and after speleotherapy. [Mohapl J](#), [Bohac S](#), [Weigl E](#). Department of Immunology, Medical Faculty, Palacky University, Olomouc, Czechoslovakia.

Changes of the selected immunological parameters before and after the speleotherapy are studied. It seems, that CIK and Complement parameters can be effected during the treatment in caves while Ig and LSZ parameters did not show any systematic changes. Details are available in the paper.

The results of the combined treatment of patients with dust-induced bronchitis [Tolmach DV](#), [Bondarenko GA](#), [Aleksanova AM](#), [Demidov IuL](#), [Denisenko AF](#).

A study in 84 patients with dust-induced bronchitis receiving combined drug treatment, hyperbaric oxygenation, hypobarotherapy and artificial speleotherapy indicates that the first place by its efficacy is occupied by artificial speleotherapy resulting in an improvement of the functional

indices of the cardiopulmonary system. The second place is occupied by hypobaric regimen. Hyperbaric oxygenation was of low efficacy.

The effect of verapamil on external respiratory function in bronchial asthma patients during high-altitude speleotherapy [Khamzamin RO](#), [Kachkynbaev KA](#), [Abdyldaeva SO](#), [Davletova RA](#).

To study the effect of speleotherapy on external respiration (ER) in asthma, ER was investigated in 2 randomized groups of 20 asthma subjects each. Speleotherapy was conducted in 24-day courses in salt caves of Chon-Tuz (2100 m above the sea level). The overall exposure lasted 160 hrs. One of the groups was assigned to additional verapamil hydrochloride aerosol therapy (10 mg/day, days 10, 12, 14, 16, 18, 20, 22). Speleotherapy was found to initiate positive shifts in the external respiration function whereas verapamil hydrochloride to potentiate the observed beneficial rearrangement in asthma patients.

Effect of the microclimate of salt mines on T- and B-lymphocyte function in bronchial asthma patients [Simionka IuM](#), [Chonka IaV](#), [Pop IL](#).

A study of 55 patients with bronchial asthma revealed a reduction of the relative number of T-lymphocytes and their IgA content. The changes were most pronounced in patients during the phase of unstable remission of the disease. Disorders of the T- and B-system of lymphocytes were associated with an increased number of cortisol-resistant lymphocytes. After a course of speleotherapy one could observe an increase of the number of T-lymphocytes and their functional activity, normalization of the number of B-lymphocytes, increase of the level of IgA, reduction of the IgM content and of the relative content of cortisol-resistant lymphocytes fraction.

Speleotherapy: a special kind of climatotherapy, its role in respiratory rehabilitation. [Horvath T](#).

Speleotherapy, the use of the climate of caves, is an accepted but not widely known therapeutic measure in the treatment of chronic obstructive airway diseases. This study summarizes the therapeutic experiences of more than 4000 patients who were treated in a 10-year period in a hospital-cave complex in Tapolca, Hungary. A sharp and long-lasting clinical improvement and a significant recovery from airway obstruction could be observed in the overwhelming majority of patients. It is established that the microclimate of some caves can beneficially affect these disorders, but the cave should be considered as an optimal environment for complex respiratory rehabilitation.

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**OUR EXPERIENCE
CONCERNING THE USE OF FORCED IONIZATION OF THE INDOOR AIR
- AS ADJUVANT THERAPY IN VARIOUS CHRONIC RESPIRATORY
DISEASE IN THE CHILD**

I. INTRODUCTION

**II. HALOTHERAPY, THROUGH FORCED IONIZATION OF THE INDOOR AIR - AN
ADDITIONAL METHOD IN THE TREATMENT OF THE RESPIRATORY DISEASE IN
CYSTIC FIBROSIS***

III. THE FORCED IONIZATION OF THE INDOOR AIR - AN ADJUVANT METHOD IN THE TREATMENT OF THE CHILDREN WITH BRONCHIAL ASTHMA

I. INTRODUCTION

The sodium ion is recognized, both in the literature and by most of the clinicians, as the main stabilizer of the cell membrane in the respiratory epithelia. In the presence of the sodium ion, takes place a fluidification of the bronchial secretions and dezobstruction of the upper respiratory airways, activation of the cilliary movements and a rapid elimination of the secretions from the respiratory tract. The inflammatory edema of the medium meatus also diminishes, leading to their repermeabilisation and sinus drainage.

This findings, unanimously accepted, are the base of clinical indications in various chronic respiratory diseases for marine aerosolotherapy and balneation in the salt sanatorium.

With the "SALIN" device we are tempting to create an atmosphere similar to that in the salt sanatorium.

15 months ago we introduced the forced aeroionization with the "SALIN" device, in children with chronic respiratory diseases:

- 10 patients with cystic fibrosis;
- 78 patients with bronchial asthma
- 22 patients with allergic rhinitis

The children with allergic rhinitis were guided and followed-up in the Otorhinolaryngology services in Timisoara

Beside the specific medical treatment the adjuvant therapy with "SALIN" device was also introduced.

The otorhinolaryngologists reported significant clinical improvement:

- decreased frequency of sneezing;
- diminished nasal obstruction
- improved quality of sleep
- favorable effect on headache.

Similar observations were communicated by Prof. Sarafoleanu from the Otorhinolaryngology Clinic in Bucuresti, over a significant lot of patients and also a medical team from the Army Hospital in Iasi.

Further on, I will give details concerning personal experience with the use of the SALIN device in the treatment of cystic fibrosis and bronchial asthma in the child.

II. HALOTHERAPY, THROUGH FORCED IONIZATION OF THE INDOOR AIR - AN ADDITIONAL METHOD IN THE TREATMENT OF THE RESPIRATORY DISEASE IN CYSTIC FIBROSIS*

Zagorca Popa¹, C. Pascu², I. Popa³, L. Pop³, Z. Popa³

- 1. National Centre of Cystic Fibrosis Timisoara, ROMANIA**
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- 3. Clinic II Pediatrics, Timisoara, ROMANIA**

** Paper presented at 24TH European Cystic Fibrosis Conference, Viena, Austria, 6-9 June, 2001*

BACKGROUND

- Cystic fibrosis (CF) is one of the most common lethal genetic disorder affecting Caucasian population.
- At the same time many epidemiological data emphasize the importance of CF in non-Caucasian population (JOINT WHO/ICF(M)A MEETING ON IMPLEMENTATION OF CF SERVICES IN DEVELOPING COUNTRIES - Manama, Bahrain, 18-19 November 1995)
- The respiratory disease in CF is the main factor which influences the prognosis.
- Setting up of a well organized therapeutic plan appropriate to the patient's age and clinical state, is the only chance for ameliorating the prognosis of these patients.

BACKGROUND (2)

- The daily home therapy with mucolytic substances in aerosols represents one of the compulsory steps of the treatment. RH-DNAse is the best option from this point of view.

- Unfortunately, in countries with a low economical standard as Romania, there is a very low possibility to have access to the rh-DNase treatment because of the very high costs.
- The concentrated NaCl solutions in aerosols as well as the courses of treatment performed in regions rich in Na ions (saline, seaside) have been observed to be beneficial for as an adjuvant in the treatment of CF.

PREMISE OF THE PAPER

- Starting from the favorable effect of the NaCl treatment, „Tehno Bionic” – Buzau, Romania, planned and built the “Salin” device for the halotherapy in chronic pulmonary diseases.
- Principle of the method: forced ionization of the indoor air by forced passing of the air through microcrystal salt deposit plates. This procedure leads to changes of the air composition and quality by salt sublimation.

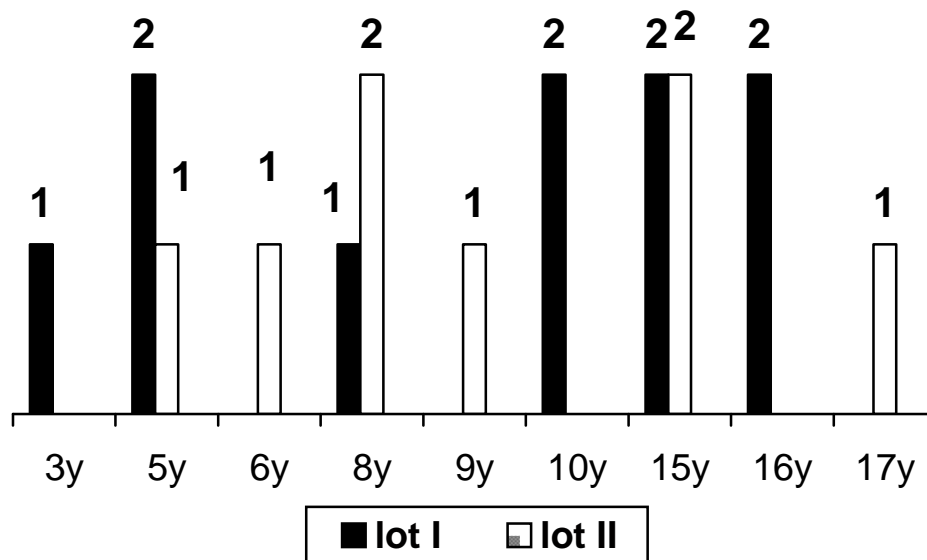
AIM OF THE PAPER

⇒ The aim of this paper is to check the therapy’s efficiency upon the patients with CF and chronic respiratory disease by ionization of the indoor air.

MATERIAL AND METHODS

⇒ This study has been realized within a 12 months interval on two lots of CF children and teenagers followed up by the Center of CF from Timisoara (Fig. 1).

Fig. 1 The age of patients



Lot I

- ♦ 10 patients (4 male and 6 female) with their age between 3 and 16 years (average 10,3 years) where we applied forced ionization of the indoor air (living room, bedroom).

Lot II (control lot)

- ♦ 8 patients (3 male and 5 female) with their age between 5 and 17 years (average 10,3 years) where the device worked without the salt plates.

MATERIAL AND METHODS (2)

⇒ The device worked approximately 8-10 hours/day, at 9 V voltage.

⇒ All patients followed the appropriate treatment during this period.

⇒ The studied parameters:

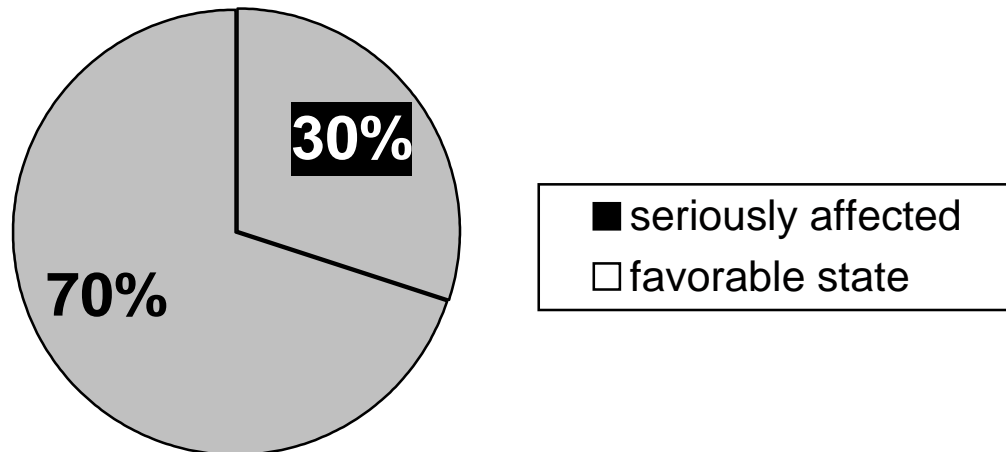
- The general clinical state of the patient by subjective self-appreciation at the young people, respectively the parents' appreciation at the younger children;
- Clinical examination of the respiratory system.
- FEV 1 value at older children.

MATERIAL AND METHODS (3)

⇒ The selection criteria for both lots have been (*Fig. 2*):

- Patients that have been seriously affected by the disease (3 from lot I, 2 from lot II):
 - ♦ Infection with *Ps. aeruginosa* and/or *Staph. aureus*
 - ♦ Bronchiectasis
 - ♦ FEV 1 < 50%
- Patients with a favorable or mild clinical state (7 from lot I, 6 from lot II):
 - ♦ Without associated infection
 - ♦ FEV 1 > 50-60%

Fig. 2 Clinical status of patients



RESULTS

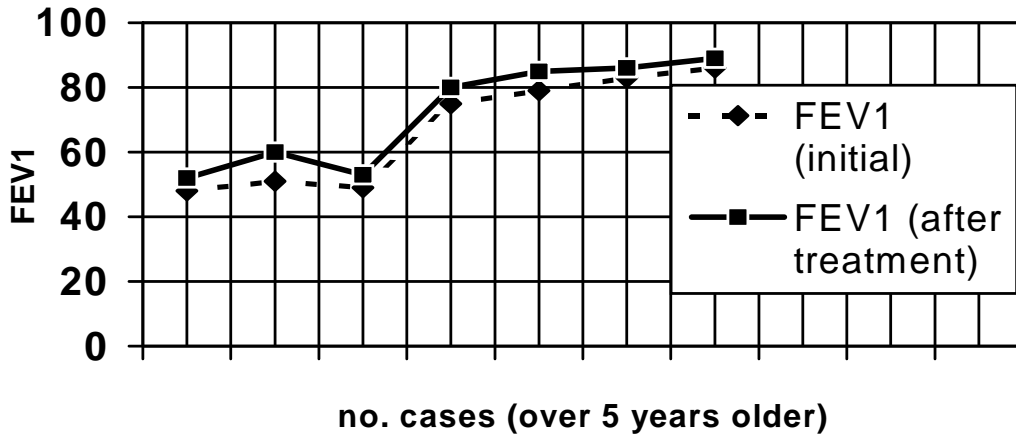
⊗ In lot I we noticed:

⇒ A significant improvement of the clinical state:

- The subjective estimation “for better” seen by the patients, respectively by the parents especially in those that have been more seriously affected;
- Improvement of the objective symptoms of the disease:
 - Increase of the sputum elimination within a first stage followed by a significant reducing of its quantity
 - Improvement of the respiratory functional syndrome
 - Reducing of the crackles at auscultation
 - FEV1 improvement (*Fig.3*)

RESULTS (2)

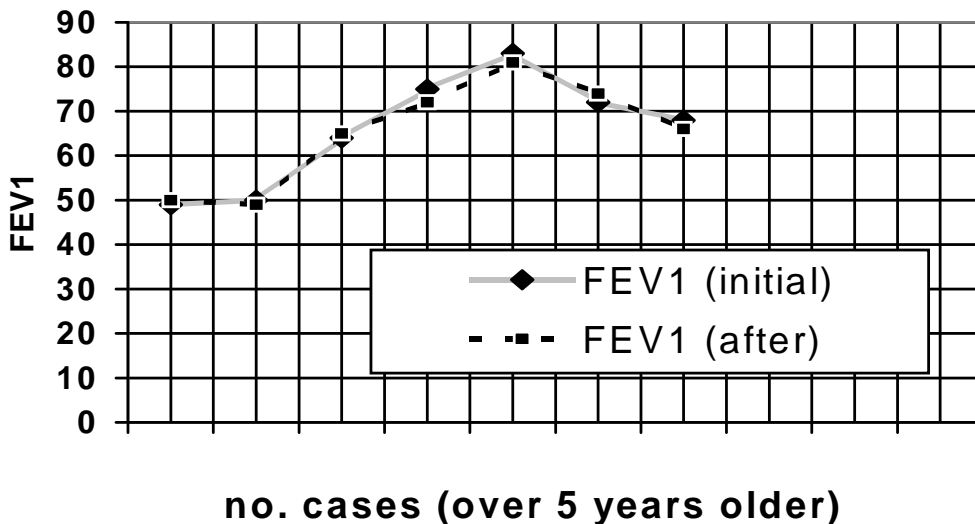
Fig. 3 Lot I (Values of FEV1, before and after treatment)



⇒ From the therapy beginning no patient showed other acute episodes of the respiratory disease that should require another hospitalization.

⊗ In lot II there were no changes similar with those from lot I (Fig.4).

Fig. 4 Lot II (Values of FEV1, before and after treatment)



CONCLUSIONS

↪ Halotherapy through forced ionization of the indoor air by salt sublimation represents an efficient method of the respiratory disease treatment in CF.

↪ The method is an adjuvant; it does not exclude classical therapy.

↪ It is a natural method of therapy adapted to the living space and it does not involve any risk.

↩ It is a method of therapy quite cheap.

Clinical trial on 22 cases of allergic rhinopathy, following the exposure to the micro climate made by the "SALIN"d

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The "SALIN" device offers, beside the known treatments, a new method in the therapy of chronic inflammatory diseases, of the respiratory system.

The Na ion is recognized, both in the reference material and by most of the clinicians, as the main cellular membrane stabilizer of the respiratory epithelium. In the presence of Na ion, it can be noticed an increase in the volume of lung surface liquids. Also the ciliary motility is activated, even in chronic smokers, whose ciliary movement is impaired, inducing a fast clearance of the respiratory secretions.

The Na ion causes the lowering of oropharyngeal airway edema soft palate, posterior portion of the tongue, often met in chronic snoring. The inflammatory edema that causes sinus osteal obstruction also decreases, leading to the sinus drainage.

These findings are the basis of clinical directions of aerosol therapy and balneotherapy in different chronic respiratory disease.

The "SALIN" device tries to achieve an atmosphere resembling to the atmosphere of the salt mine sanatoriums.

Having at our disposal 22 "SALIN" devices, we recommended a minimum 3 hours a day exposure (on an average of 6 hours) for 3 months to 22 patients with chronic allergic rhinopathy. All these patients were polyallergic but the house dust was met as an incriminated allergen in all of them, without other prevalent diseases.

Their age was between 22 and 53 years old, 15 women and 7 men.

The exposure was made without giving up the antiallergic treatment prescribed by their physicians.

The following signs and symptoms were noticed:

- nasal obstruction
- headache
- rhinorrhea
- sneezing
- cough
- dry throat sensation
- the quality of night sleep
- the quality of sputum

In 13 patients from those previously mentioned, we also examined:

- the edema of uvula
- telangiectasias of the posterior portion of the tongue
- the aspect of pituitary gland

Results and discussions

- We noticed that women are more conscientious in following the treatment.
- The quality of sleep was evidently improved in all the studied patients by night exposure to "SALIN".
- The nasal obstruction and sneezing were evidently improved in 18 patients representing 81.8 %.
- Seromucous rhinorrhea got thicker and more voluminous, in only one case rhinorrhea remained.
- Headache as a syndrome was noticed initially in 12 of patients. For half of them the exposure had a favorable result.
- Cough was, in general more efficient and wet, the effort for removing the sputum decreased and the sputum got more fluid.
- The benefit effect was immediately noticed at 7 patients, chronic smokers.
- The dry throat sensation was diminished in a better or smaller degree at all the patients.
- At the clinic exam of the 13 cases mentioned forward, we noticed the lowering of the edema soft palate after maximum 10 days.

Conclusions

1. The Salin device brings back in present the Na ion as the main cellular stabilizer of the respiratory epithelium.
2. The Salin device represents a convenient alternative of marine aerosol therapy or halotherapy of the saline sanatoriums (speleotherapy).
3. The Salin device represents a useful help in the treatment of chronic diseases of the superior respiratory ways as:
 - allergic rhinopathy
 - chronic sinusitis
 - chronic rhinitis

FORCED IONIZATION OF INDOOR AIR AS AN ADJUVANT ALTERNATIVE IN THE THERAPY OF ASTHMA AND CHRONIC BRONCHITIS

Prof. Dr. V Tudorache*, St. Mihaicuta*, Rodica Potre*, Anca Kigyosi**
*The Clinic of Pneumo-physiology; ** the Chair of Medical Informatics – U.M.F Timisoara

SUMMARY

Goal: The estimation of the impact of forced ionization (NaCl) of indoor air, as an adjuvant therapy of chronic bronchitis and asthma, using a device manufactured in Romania.

Protocol: a controlled placebo study for a period of 12 month. Location: patients registered in the outpatient clinic of pulmonary diseases and from a GP consulting room.

Participants: 30 patients (9F and 21 M) suffering from simple chronic bronchitis (11) and bronchial asthma(19) associated with allergic rhinitis .The patients were distributed in 2 lots, Lot I (the study), including 17 patients, and Lot II (the placebo), including the other 13 patients, with a comparable distribution per age, pathological profile and standard treatment.

Measured variables: the basic spirometric parameters (FEV₁, FVC), the number of recurrences, the necessity of a symptomatic medication, and the indices of living quality.

Results: in the control lot there were noticed a minimum improvement of FEV₁ (increase of 11%) the improvement of the clinical scores (diminution of cough, sputum volume, nasal congestion, ocular pruritis and so on). The effects of these modifications were an improvement of the living quality, more rare hospitalizations and a diminution of the symptomatic medication.

Conclusions: as an ancillary treatment, the forced ionization of in door air, though it does not improve significantly the pulmonary function, improves, however, the quality of the patient's life and diminishes the rate of annual hospitalizations. It is worth being mentioned the method advantages: there is no risk, is affordable and adapted to the living space

INTRODUCTION

The increase of morbidity of the persons suffering from an inflammatory disease of the lung, as asthma or bronchitis, is associated with the increase of air pollution with particles. As a hypothesis it is supposed that the inhaled airborne particles can amplify the inflammation of the breathing way present in these diseases, worsening the symptomatology. But the penetrability of an inhaled agent depends on its type (aerosol, dry powder), characteristics (concentration / tonicity, aerodynamic diameter), aerosol using conditions (ultrasonic nebulizer, or with IPP and so on), as well as on the bronchial obstruction degree when the aerosol is inhaled (Barry P., Fouroux B-2000). Given these considerations, in the attempt to heal the airways, various devices (MDI, diskhalers, turbohalers)

and substances (broncho-dilator and anti-inflammatory, culminating with corticoids) (Boe J, Dennis J -2000) were efficiently used. But the high price of these drugs and the handling of the inhaling devices, raised for discussion the adjuvant alternatives by which physiologic (normotonic solution of NaCl) or pharmacological (magnesium sulfate, manitol, furosemide) agents, cheap and simply to be administered (Speleotherapy, inhaling from nebulizers, with or without a mask, simple spray, and so on) were used for the same goals: the diminishing of inflammation and bronchial hyper-reactivity, the restoring of muco-ciliary clearance and so on) (Kugelman A, Durand M – 1997). Starting from the indisputable benefits of Speleotherapy (using of the salt mines in the treatment of the obstructive bronchial syndromes), it has been looked for the creation of some microclimates simulating the conditions in a mine. Our study can be included in this last category, where the salt from a mine is placed in a device, which spreads it in the environment.

MATERIAL AND METHOD

The study goal was the estimation of the impact of the forced ionization of indoor air, by using of a device developed in Romania: SALIN.

The device working principle consists in the forced air passing through some plates with sediment layers of micro crystallized salt, which modifies the air composition and quality due to the salt sublimation.

Participants: 30 patients (9F and 21 M) suffering from simple chronic bronchitis (11) and bronchial asthma (19) associated with allergic rhinitis. The patients were distributed in 2 lots, Lot I (the study), including 17 patients, and Lot II (the control placebo), including 13 patients, divided per age and comparable pathological profile (table I). For Lot I, the air ionization was associated with the standard treatment and was carried out in the living room or in the bedroom, and for the Lot II, the device worked without the salt plates in it, the patients being treated only conventionally (the controlled placebo study).

Only patients suffering from asthma, the 2nd – 3rd stage, were included. We proceeded to such a selection to limit the errors, which can be induced by the intensely fluctuating feature of the intermittent or mild stage (the 1st one), and by underestimations caused by the phenomenon of clinical tolerance occurring more frequently in the 4th – 5th stages. These were the reasons why only the patients suffering from bronchitis, the 2nd stage (according to the international classification from Stockholm – 1999) were included, namely with simple chronic bronchitis, with a moderate pulmonary dysfunction ($FEV_1 > 50\%$) without any other diseases, malnutrition, or chronic use of steroids, without bronchial colonization with intensely pathogenic germs (Enterobacteriaceae, *Ps aeruginosa*) and frequent exacerbation (table I).

Table I. The structure of the studied lots

Lots of patients	Lot I (the study): 17		Lot II (the placebo): 13	
	AB: 10	Bronchitis: 7	AB: 9	Bronchitis: 4
Number of patients	AB: 10	Bronchitis: 7	AB: 9	Bronchitis: 4
Age(year)	34 ± 7,7	46 ± 9,2	36 ± 11,8	43 ± 8,3
Sex				
M	7	6	6	3
F	4	1	3	1
Disease duration	5-25	6-14	3-22	8-11
Stage/severity	7 st. II, 3 st. III (GINA classification)	Chronic simple bronchitis *	7 st. II, 2 st. III (GINA classification)	Chronic simple bronchitis *

* Stage II in the International Classification of the Bronchitis (Stockholm, 1999).

Localization: patients registered in the outpatient clinic of pulmonary diseases and from a CP consulting room.

The study protocol: a physician specialized in pulmonary diseases diagnosed and monitored. The usual control was made every 2 months (with the exception of spirometry which was performed at the beginning and after 6 and 12 months) and any time the patients or the general practitioner required. The study was carried out for 12 months.

The device was placed next to the patient's bed, not farther than 1m, with the exhalation window directed towards the patient level. The device operated for minimum 8-10 hours /day at the last level (12) and at the last but one level (9) of intensity, at least during the night; the door and the windows of the room were closed to increase the concentration of Na aerosols as much as possible. Every 3-4 months the set of plates inside the device was changed!!!(inclusively to the placebo lot). The observation period of 12 months enabled us to appreciate more accurate the recurrences, as both diseases, but especially asthma are known as having a significant fluctuating evolution, modulated by various factors: exposure to antigens, season, atmospheric pollution, vaccinal status, and so on.

Measured variables: the basal spirometric parameters (FEV1, FVC), PEF, the number of recurrences, the demand for symptomatic medication, the indices of living quality. A questionnaire for the clinic score estimation was used - the bronchial obstruction, the signs of rhinitis, - adapted from Elisabeth Juniper(Juniper E, O.Byrne P et al., 1999 and 2000).(table II)

Table II

(a) Frequency of nocturnal awakening (T)	(b) Symptoms intensity in the morning (M)
0 - never 1 - maximum 1- 2 /month 2 - maximum once a week 3 - several times/week 4 - continually	0 - absent 1 - very little 2 - little 3 - moderate 4 - severe enough 5 - severe 6 - very severe
(c) Limitation of the physical effort(E)	(d) Intensity and duration of dyspnea (D)
0 - absent 1 - very little 2 - little 3 - moderate 4 - very limited 5 - extremely limited 6 - totally limited	0 - absent 1 - very small 2 - small 3 - moderate 4 - high enough 5 - high 6 - very high
(e) Wheezing duration (W)	(f) Demand from β 2- agonist(no. of puffs/day) (B2)
0 - absent 1 - almost absent 2 - a short period of time 3 - a moderate period of time 4 - a long period of time 5 - almost all the time 6 - all the time	0 - absent 1 - puffs/day = 1-2 2 - puffs /day = 3-4 3 - puffs /day = 5-8 4 - puffs /day = 9-12 5 - puffs /day = 13-16 6 - puffs /day > 16
(g) Sputum output (S)	(h) Allergic rhinitis or with an allergic component (R)
0 - absent 1 - intermittently present 2 - permanently present: < 30 ml/day 3 - permanently present: 30 - 50 ml/day 4 - permanently present: > 50 ml/day 5 - frank suppurative feature	0 - absent 1 - Intermittently 2 - Permanently 3 - aqueous rhinoree \pm sneeze \pm tears intermittently 4 - aqueous rhinoree \pm sneeze \pm tears, quasi-permanently 5 - smell absence + at least 2 elements from 1 to 4
(i) Pef score	(j) FEV1 score

0 - > 95% of the one predicted	0 - > 95 % of the one predicted
1 - 95-90%	1 - 95-90%
2 - 89-90%	2 - 89-90%
3 - 79-70%	3 - 79-70%
4 - 69-60%	4 - 69-60%
5 - 59-50%	5 - 59-50%
6 - < 50% of the one predicted.	6 - < 50% of the one predicted

**FORCED IONIZATION OF THE INDOOR AIR - AN ADDITIONAL
METHOD IN THE TREATMENT OF THE RESPIRATORY DISEASE IN
CYSTIC FIBROSIS (CF)**

Ioan Popa¹, Constantin Pascu², Zagorca Popa³, Liviu Pop¹

1. Clinic II Pediatrics; 2. Tehno Bionic Buzau; 3. Cystic Fibrosis Center Timisoara, Romania

PREMISE OF THE PAPER

- The respiratory disease from CF is the main factor, which influence the prognosis.
- Setting up of an well-organized therapeutic plan appropriate to the patient's age and clinical state, is the only chance for ameliorating the prognosis of these patients.
- The daily home therapy with mucolytic substances in aerosols represents one of the compulsory steps of the treatment. rh-DNAse is the best option for this point of view.
- Unfortunately, in the countries with a low economical standard as Romania, there is a very low possibility to have access to the rh-DNAse treatment because of the very high costs.
- The concentrated NaCl solutions in aerosols as well as the courses of treatment performed in regions rich in Na ions (saline, seaside) have been beneficial for as an adjuvant in the treatment of CF.
- Starting from the favorable effect of the NaCl treatment, "TehnoBionic" planned and built the "Salin" device for the forced ionization of the indoor air.
- Principle of the method: *forced passing of the air through microcrystal salt deposit plates*. This procedure leads to changes of the air composition and quality by salt sublimation.

AIM OF THE PAPER

- *The aim of this paper is to check the therapy's efficiency upon the patients with CF and chronic respiratory disease by forced ionization of the indoor air.*

MATERIAL AND METHODS

- This study has been realized within a 6 months interval on two lots of CF children and teenagers followed up by the Centre of CF from Timisoara (Fig. 1).

Lot I

- 10 patients (4 male and 6 female) with their age between 3 and 16 years (average 10.3 years) where we applied forced ionization of the indoor air (living room, bedroom).

Lot II (control lot)

- 8 patients (3 male and 5 female) with their age between 5 and 17 years (average 10.3 years) where the device worked without the salt plates.
- The device worked approximately 8-10 hours/day, at 9V voltage.
- All patients followed the appropriate treatment during this period.
- The studied parameters:
 - The general clinical state of the patient by subjective self-appreciation at the young people, respectively the parents' appreciation at the younger children;
 - Clinical examination of the respiratory system;
 - FEV 1 value at older children
- The selection criteria for both lots have been (Fig. 2):
 - Patients that have been seriously affected by the disease (3 from lot I, 2 from lot II);
 - Infection with *Ps.ae.* and/or *Staphylococcus aureus*
 - Bronchiectasis
 - FEV 1 < 50%
 - Patients with a favorable or mild clinical state (7 from lot I, 6 from lot II);
 - Without associated infection
 - FEV 1 > 50-60%

Fig. 1 The age of patients

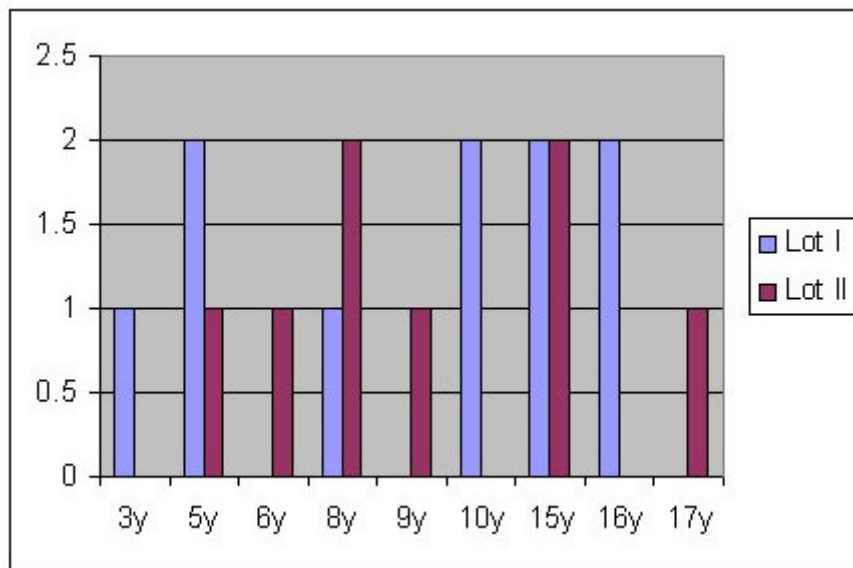
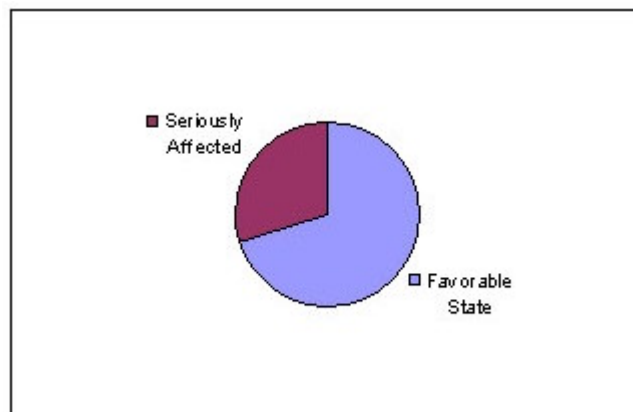


Fig. 2 Clinical status of patients



In lot I we noticed:

- A significant improvement of the clinical state
- The subjective estimation "for better" seen by the patients, respectively by the parents especially in those that have been more seriously affected;
- Improvement of the objective symptoms of the disease:
 - □ Increase of the sputum elimination within a first stage followed by a significant reducing of its quantity
 - □ Improvement of the respiratory functional syndrome
 - □ Reducing of the crackles at auscultation
 - □ FEV1 Improvement (Fig.3)

From the therapy beginning no patient showed other acute episodes of the respiratory disease that should require another hospitalization.

In lot II there were no changes similar to those from lot I (Fig. 4)

Fig. 3 Lot I (values of FEV1, before and after treatment)

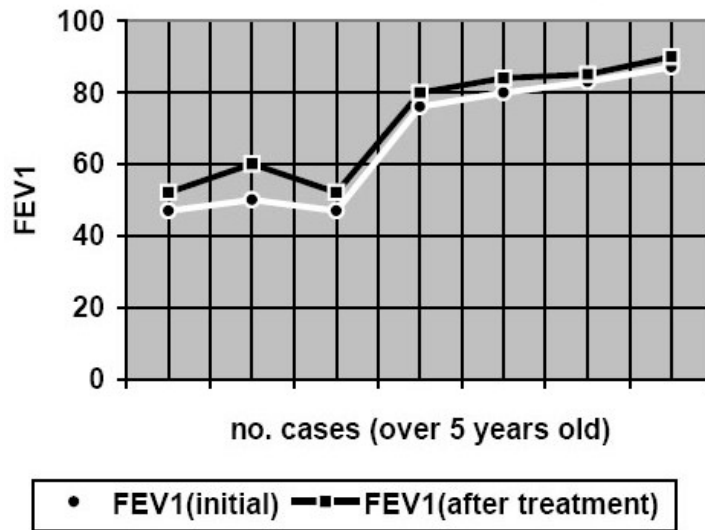
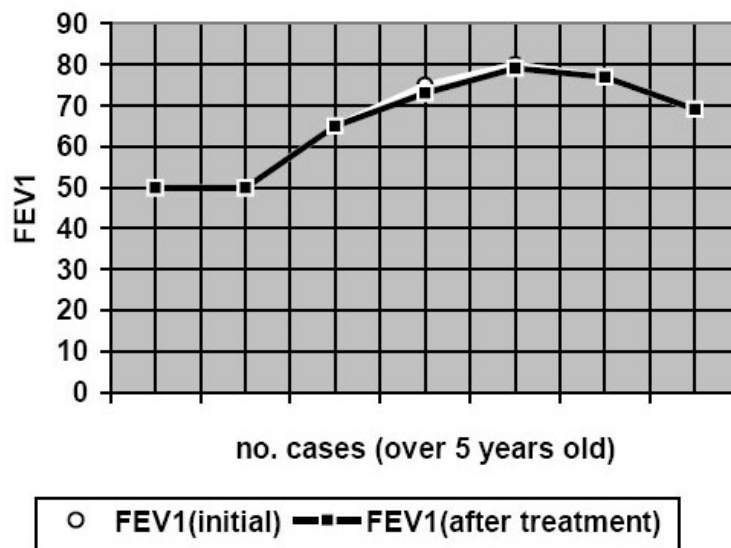


Fig.4 Lot II (Values of FEV1, before and after treatment)



CONCLUSIONS

- Forced ionization of the indoor air by salt sublimation represents an efficient method of the respiratory disease treatment in CF.
- The method is an adjuvant, it does not exclude classical therapy.
- It is a natural method of therapy adapted to the living space and it does not involve any risk
- It has a quite modest cost.

SALIN DEVICE – HELPS IN PREVENTING AND TREATING OTITIS MEDIA IN CHILDREN

By: Dr. Zabus Dorinela, ENT specialist
Chem. Constantin Pascu – Chemical Engineer

Besides other natural remedies that aim at improving the quality of life, Salin brings back the old concept that every salt mine is a house of health. The method consists in: forced passing of the air through plates with sediment layers of micro crystallized sodium, calcium and magnesium salts, having an air ionization effect, reducing the carbon dioxide, reducing the bacteria content, smoke and odors indoor and helps increase the fluidity of the airways secretions through quality modifications of the mucus.

The high morbidity rate due to non suppurative otic pathology in children, knowing that 80% of infants up to 3-4 years old had at least once an ear inflammation with consequences like impaired hearing due to chronic otitis, made us initiate a study on an alternative and complementary method for preventing and curing non suppurative otitis (sero-mucous acute and chronic otitis media).

Materials and Method:

The clinical and para-clinical introspective and retrospective study (otoscopy, audioimpedantmetry, allergic tests) of a lot of patients with non suppurative acute or chronic otic pathology registered in the outpatient's ENT consulting room of the 'Spitalul clinic de Urgenta nr. 3 de copii Louis Turcanu' in Timisoara City, Romania (Louis Turcanu, # 3 Clinic Emergency Hospital for Children)

The lot parameters are as following:

- Lot 63 patients
- Gender 29 boys ; 34 girls
- Age between 1 and 18
- Average age 6.9

The study goal is to compare the lot of 63 patients with otic pathology between 01/01/2000 and 31/12/2000, without Salin device (1st LOT) with the same lot using the Salin device between 10/01/2001 and 31/01/2002.

The target of the study is to asses the contribution of Salin device in helping the amelioration and treatment of the respiratory and ear disease and prevention of reoccurrence of non suppurative otitis.

The parameters studied are:

- Monthly monitoring of the general clinical state of the patient along with the respiratory and ear symptoms, using a questionnaire filled up by the patient and/or parent
- Otomicroscopy- monthly and during periods when symptoms were more acute
- Audioimpedantmetry - monthly and during periods when symptoms were more acute
- Allergic tests for some patients

Salin device for the 2nd LOT was supplementary introduced along with the appropriate medical or surgical treatment. In the study lot, the otic pathology was prevalent and the comorbidities were:

- Adenoiditis / chronic adeno-tonsillitis, 21 cases (33%)
- Rhinitis / chronic rhino- sinusitis in 17 cases (27%)
- Bronchial asthma in 5 cases (8%)
- Atopic dermatitis in 2 cases (3%)

Salin device was put to work on an average of 10 hours a day, at a 9 V voltage. All patients followed the regular medical or surgical therapy suitable for each case.

Results and Comments:

1st LOT – without Salin device:

- The respiratory symptoms (sneeze, rhinorrhea, nasal obstruction, cough, otalgia, hearing impairment, fever) were present in moderate or severe form in 49 cases (77%) as isolated or associated symptoms.
- At otomicroscopy the tympanic modifications were obvious in Valsalva test in 58 cases (92%)
- Audioimpedantmetry showed tympanograms type B(73%) and type C (27%)
- The allergic tests were positive in 5 cases with asthma and in 3 cases with chronic rhinitis.

2nd LOT – with Salin device

- Respiratory and otic symptoms were present in severe or moderate form in 28 patients (44%)
- Otomicroscopy showed tympanic modifications in 41 cases (65%)
- Audioimpedantmetry showed tympanograms type B (24%), type C (53%) and type A (23%).
 - Tympanograms B signals the absence of the air in the middle ear and the possible presence of the fluid in the middle ear;
 - Tympanograms C signals the partial absorbtion of the air from the midle ear and its gradual replacement with transsudate or exsudate.
 - Tympanograms A shows the presence of the air in the middle ear and normal mobility of the tympano-ossicular system.
 - Tympanograms B and C were associated with slight or moderate hearing impairment.
- The allergic tests were positive in 5 cases of asthma.

The reoccurrence of otitis diminished to 1 outburst a year comparing to 2 outbursts a year for the 1st LOT.

Conclusions:

1. Alleviation of clinic severe and medium symptoms for 33% of the patients along with improvement of respiratory quality and intellectual and physical effort, are clinical arguments that cannot be neglected giving Salin a well-deserved place in medical treatments.
2. Salin helps diminishing macroscopic modifications of the tympanum in 27% of the patients, thus justifying alleviation of otitis clinic symptoms like (otalgia, autophony, decreased hearing)
3. Audioimpedantmetry, the best diagnostic method of nonsuppurative middle ear pathology (without perforation), shows the changes from pathology (24% compare to 73% tympanograms type B, 27% compare to 53% timpanograms C) to normal (from 0% to 23 % of Timpanograms A); all these facts show an improvement in tubo-tympanic drainage.
4. Better draining of the tubo-tympanum and airing of the tympanic cavity can happen due to modifications of the quality and / or quantity of the mucus as well as due to the favorable effects of the aeroions on the mobility of the respiratory membrane cilia.
5. Besides symptomatic drugs, antibiotics, vitamins and immune-modulators, antialergic, Salin device has been introduced in the therapy protocols in treating rhino-sinuses pathology and acute and chronic otic pathology. The benefits of Salin are evident, since for 50% of the patients there was a reduction of the antibiotics intake and in asthma cases a reduction of corticoids intake.
6. Salin is a beneficial adjuvant, however without excluding the classic therapy, therefore the patients should be under medical observation.
7. In order to strengthen the therapy in bronchial asthma and in non suppurative allergic or non allergic chronic otic pathology, the patient need to undergo 1 or 2 treatments a year in the salt mines becomes costly considering the travel and other afferent expenses. From this point of view, Salin is becoming a cost effective option.
8. The possibility to use the Salin device in the living space strengthens the therapeutic effect of the treatments in the salt mines.
9. The quantity of otic sero-mucous secretion in the first days after tympanotomy significantly decreased and the tympanum reconstruction duration has reduced from 5-7 days to 4.

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