



**Salt cave Technology
&
Scientific References**



The state of the art technology used at Changeland's Salt Caves

Changeland's Salt Caves are based on technology tested for many years and which is using mineral and sea salt for Relaxation and Rehabilitation purposes. The objective is to produce the microclimate of a salt mine recreating the natural, chemical, biological and rehabilitating conditions existing there at a location easily approachable to people who leave and work in the cities.

The interior of a Changeland Salt Cave is carefully designed in order to re-create and maintain the **temperature, humidity and the unique microclimate** which can be found at a depth of 350m at the world famous salt mines and sanatoria of **Wieliczka** and **Bochnia** in **Poland**. The unique healing attributes of this microclimate are due to the enriched air that circulates inside the Saltcave. This air is rich with salt ions and microelements. It's cleanliness and purity against bacteria and other microorganisms is preserved through the use of special salt mine air-conditioning system and antibacterial ultraviolet lamps.



The Changeland Saltcave has a heated floor, covered with mineral salt from Polish salt mines and sea salt from the Dead Sea. With the increase of the floor temperature, salt generates ions and enriches the air of the cave.

The walls and roof of Changeland's salt cave are **completely** covered with tones of mineral salt rocks from Casmir. These salt rocks are stack on top to one another, glued together with natural resin and sustained with wood, as in salt mines. It should be noted that in the Changeland's Salt Caves there is no gyps or other artificial material which is used found in other "caves" both for decoration purposes (decorative stalactites) and ease of construction. The use of gyps in environments reach of salt ions creates nests for bacteria and this is why it is bound from Changeland's Salt caves.

Furthermore, the floor is heated and walls are lighted with low voltage (12 Volt). This is for safety reasons (salt is a positive conduit of electricity) and also for economic and ecological reasons. Changeland's salt caves have zero maintenance cost, minimum operational cost (€45 in electricity per month while in use 7 days a week, 12-15 hours per day), zero cost of goods and is covered by guarantee at EU standards. Changeland Salt caves fully complies with the strict criteria of use in hospitals and **has been installed in state hospitals** (e.g. city Micolow in Poland).



Scientific references

Researches and studies have proven the beneficial value of the Halotherapy inside salt caves such as "Crystalotherapy", **against stress**, in the **reduction of smoking, during pregnancy**, both for the mother and for the embryo, as well as in the cases of diseases presented in the matrix. In pages 4 – 19 find 30 representative scientific reports.

<u>Medical cases</u>	<u>Scientific references</u>	<u>Medical cases</u>	<u>Scientific references</u>
RESPIRATORY INFECTIONS	<u>1,2, 6-9, 13-29</u>	SKIN DISEASES	<u>3, 6-10</u>
<ul style="list-style-type: none"> · Upper respiratory system infections · Asthma and bronchitis · Sinusitis · Chronic obstructive pneumonopathy · Bronchiectasia · Chronic pararrhinocolpitis · Chronic parasinusitis · Pneumonoconiasis 		<ul style="list-style-type: none"> · Acne · Dermatitis · Allergies · Psoriasis · Delay in skin aging · Wrinkle removal 	
CARDIOVASCULAR DISEASES	<u>5, 9, 10</u>	DISORDERS OF METABOLISM	<u>4, 5, 8, 9</u>
<ul style="list-style-type: none"> · Hypertension · Circulatory insufficiency · Post-infarct period 		<ul style="list-style-type: none"> · Contribution in facing obesity · Diabetes 	
GASTROINTESTINAL DISEASES	<u>4, 5, 8, 9</u>	SKELETAL SYSTEM DISORDERS	<u>4</u>
<ul style="list-style-type: none"> · Large intestine inflammation · Crohn's disease · Ulcerative colitis · Spastic colon colitis · Chronic constipation · Malabsorption problems · Gastritis · Stomach & duodenal ulcer 		<ul style="list-style-type: none"> · Prevention of osteoporosis · Discopathy – back pains · Treatment of pains from rheumatopathy & chronic osteoarthritis 	
NERVE SYSTEM DISORDERS	<u>4, 5, 9, 10</u>	CHILDREN & PREGNANCY	<u>8 & 1-12</u>
<ul style="list-style-type: none"> · Stress · Chronic fatigue syndrome · Panic attacks · Improvement in ability to concentrate · Depression 		<ul style="list-style-type: none"> · influenza diseases · all above mentioned cases 	
		ATHLETES	<u>14, 15</u>
		<ul style="list-style-type: none"> · improvement of respiratory capacity · all above mentioned cases 	
DIABETES	<u>31</u>		



References from experts on theme salt caves

1. **Julie Ackendorf Halotherapy - How Inhaled Salt Can Help Treat Respiratory Conditions.**

The use of halotherapy and salt cave therapy have been shown to be a natural way to help relieve symptoms of **respiratory conditions** such as **asthma** and **bronchitis**. For centuries Eastern Europeans have taken advantage of salt caves in order to naturally treat respiratory problems like asthma and bronchitis. This drug-free approach to treating respiratory conditions is not accepted everywhere but those who have used this method of treatment and international researchers have stated that the use of salt cave therapy (speleotherapy) and similar halotherapy have **great respiratory benefits**.

Speleotherapy. Patients who opt for speleotherapy spend time in salt caves doing various activities and breathing exercises. The natural salt ions and microns combined with pure unpolluted air seem to have major benefits and improve the lung functions in individuals with respiratory diseases. The Ukrainian **Allergologic Hospital** is a widely known hospital and reports that in a thirty year study over **60,000 individuals were cured of their respiratory conditions due to speleotherapy**.

Halotherapy. Due to the fact that salt mines are not easily found and available in all parts of the world, physicians and researchers developed a way to create an artificial environment in which conditions are similar to a **salt cave**. When such an environment is used to treat respiratory conditions it is called halotherapy. Patients enter peaceful chambers that look very much like true **salt cave**. As the pure and therapeutic air enters their lungs through inhalation they experience all of the same benefits as if they were in an actual salt cave. Additional benefits to halotherapy are patients can be monitored by their physicians during treatment and certain atmospheric conditions such as humidity and temperature can be altered to best treat each individual patient's unique problem. Halotherapy is **completely drug-free** and can be used by people of **all ages** and with **all types of illness**. Halotherapy is **safe for all populations**, including **children** and **pregnant women**.

2. **J. Hedman, T. Hugg, J. Sandell, T. Haahtela. 'The effect of salt chamber/cave treatment on bronchial hyperresponsiveness in asthmatics'. Article first published online: 30 MAR 2006, DOI: 10.1111/j.1398-9995.2006.01073.x, Allergy European Journal of Allergy and Clinical immunology.**

Key words: asthma; bronchial hyperresponsiveness; complementary treatments; salt chamber/cave; speleotherapy

Background: Randomized controlled trials are needed to evaluate the effects of complementary treatments in asthma. This study assessed the effect of salt chamber/cave 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/cave treatment lasted 40 min and was administered five times a week.

Results: Median provocative dose causing a decrease of 15% in Fev1 (PD15FEV4) 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 FEV1 values measured before the histamine challenges, changed. The reduction in BHR was not caused by changes in the baseline lung function.



Conclusions: Salt chamber/cave 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.

3. M.D. Tibor Barta PhD., head of the First Otolaryngology clinic of Teaching Hospital with Policlinic in Bratislava - Petržalka, Slovakia

It is suitable to support acute and especially chronic respiratory apparatus disease treatment (e.g. **allergic and non-allergic snuffles, chronic and acute inflammation of vocal cords, asthma**), including nasal cavity (e.g. **nasal septum, nasal conchae**), **sinuses**, pharynx (**pharyngeal and palatine tonsils**) and **larynx (vocal cords surgery)** by a so-called climatic treatment.

Climatic treatment or climatotherapy belongs to the non-medicament treatment methods, where an organism is subjected to healing effects of a special climate (stay in upland, sea or a cave). Climatic treatment speeds up healing processes. Healing effects of salt minerals can be used and are well known for centuries. Various procedures based on salt are carried out either directly in salt-mines or with the help of respiratory devices at rehabilitation and treatment centers. In general, walks by the seaside, especially in the morning and after heavy sea, when the air is ionized and saturated with iodine, are recommended. Although nature didn't endow Slovakia with a sea, beneficial effects of seaside microclimate are also available here through **salt caves**. Their atmosphere possesses rare microclimate with unmatched bacterial cleanliness. Salt is a compound of our organism, thus very important for us. From the point of view of an otolaryngologist (specialist for head and throat diseases), **I definitely recommend healing treatments in salt caves**, which considerably help improve patient's fitness and speeds up the healing of diseases of the nasal cavity, sinuses, pharynx, larynx and thyroid. Moreover, beneficial effects of this microclimate have a positive affect on the healing of other diseases, too.

4. M.D. Milan Simko, immunologist - allergiologist, Teaching Hospital with Policlinic in Bratislava - Kramare, Slovakia

At first, the positive effects of staying in caves on the respiratory tract were attributed to the ability of inhaled aerosol to dissolve viscose mucus, which can be consecutively easier to cough out. However, the latest research suggests important regulation roles of skin surface and respiratory tract. **While human skin has a surface of 2m², the respiratory system has a surface of 100m². Therefore inhalatory therapy is much more efficient than the effects of aerosol applied to the skin and represents an important regulation role in the whole organism.** These regulation mechanisms have the beneficial effect with the treatment explained even for diseases unrelated to the respiratory tract. Exact studies discovered another positive effect of this treatment - killing of disease-inducing microorganisms in the respiratory tract. Aerosol in caves contains microelements which make up a vital part of enzymes and hormones; organism needs them in order to function optimally and our ordinary everyday food do not provide enough of them. A stay in a **salt cave** can supplement the deficit. **Immune, neural and endocrine glands systems** are interconnected and aerosol treatments influence all three mentioned systems, increases organs' congestion of blood, which explains the complex influence of aforementioned treatments, including **anti-inflammation treatments**, resulting in **reduced painfulness in rheumatism** and the **positive effect on some neural disorders and cardiovascular diseases**.

From the empirical knowledge of climate-therapy which observes long-term improvement of disease state with a stay at sea in length of minimum 3 weeks, we determined that given the quantity of aerosol elements in seaside region and in a salt cave, a **3 week long stay at sea should be equivalent to 7 - 10 stays for 45 minute in a salt cave**.

Recommended indications suitable for salt cave treatment:



- all **inflammation** and also **allergic diseases** of the upper and lower respiratory tract
- **allergic skin diseases, atopic dermatitis, psoriasis, diseases caused by contact allergy**
- **inflammation diseases of the intestines, ulcerative colitis, Crohn's disease, stomach and duodenum ulcers, irritable bowel syndrome**
- **ischemic heart disease, hypertension, vascular diseases**
- **degenerative and inflammatory rheumatism**
- **vegetative dystonia**
- **neurotic disorders, depressions, chronic fatigue syndrome, stress disorders**
- **hypothyroidism**

5. Lecturer M.D. Igor Kajaba PhD, internist - gastroenterologist, Institute of preventive and clinic medicine, Bratislava, Slovakia

Basic prerequisite for existence of human life is guaranteed by **metabolism**, through the supply of nutrients, the presence of enzymes and the function of **hormonal**, substantial and **neural** regulation.

It is known, that approximately a third of enzymes need presence of metal ions as activators for their functionality and therefore are called metalloenzymes. Most of them protect cells from oxidation damage and creation of oxidation stress on organism and these enzymes contain elements like zinc, copper, manganese, nickel, chrome, iron, selenium, etc.

In addition, minerals and elements have important functions in tissues, for example structural - calcium, phosphorus, magnesium, potassium, fluorine, silicium and iodine. **Iodine** is a basic component of hormones produced by **thyroid**, **zinc and nickel** take part in the production of **insulin**, **selenium** is an integral component of the most important **antioxidation** enzyme, glutathione peroxidase. **Chrome** is a basic component of the glucose toleration factor, which regulates and enables metabolism of sugars, supports the effect of insulin in tissues and **prevents the creation of diabetes**. Minerals also ensure the stability of the inner environment (homeostasis) and retain acidobasic equilibrium, in which mostly sodium, chlorine, potassium, calcium, magnesium, phosphorus and sulphur take part. Sodium, calcium, potassium and magnesium have an important role in the **regulation of neural impulse transmission**.

Most of the aforementioned minerals are comprised in sea salt from which are released and **can be found in salt cave environments** and by staying in such a cave are absorbed into organism via the mucous membranes and also via digestion tract, improving income and supply of these irreplaceable elements, necessary for **good health, performance and overall fitness of the population of all ages**.

Moreover, an enjoyable environment combined with calm music reproduction is the ideal place for **spiritual relaxation, meditation**, and **comfort** but also for the **feeling of a joyful and happy life!**

There are scientific reasons for staying in or receiving a salt cave treatment from the point of view of **digestion tract diseases**:

- **inflammation of the oral mucous membrane, gums and tongue, periodontal disease**
- **non-infectious inflammation of the mucous membrane in the esophagus, stomach, duodenum, small intestine and colon**
- **psychosomatic diseases like stomach and duodenum ulcers, irritable bowel syndrome, functional disorders of the gall bladder and gall duct (mostly with tendency to convulsion states)**
- **long non-specific inflammation of the bowels - e.g. bleeding and ulcerous inflammation of colon and anus (colitis ulcerosa) in convalescence and in a calm state (prevents new inflammation diseases) and also by Crohn's disease**
- **long diseases of the liver with autoimmunity characteristics**



In all cases the climatotherapy represents effective support of basic treatment, in calm states as an important secondary prevention from the possible recurrence of the abrupt disease states.

6. Prof. M.D. Jiri Homolka, DrSc., head of 1st lung clinic of 1st Medical School of Comenius University and General teaching hospital in Prague, Czech Republic. Magazine Nova Tina, issue 43, 26th of August 2005

Healing effects of salt have been well-known for centuries and today we return to this source of health. An example represents a treatment, which patients underwent in thirties of the **19th century in salt-mine Wieliczka in Poland**. Since **1958**, this mine was commonly used in the **treatment of asthma, diseases of the upper and lower respiratory tract and allergic diseases**.

It is also well-known, that for the mentioned diseases and skin diseases a stay at the sea is useful. Some health insurance companies financially support these stays or cover the major part of the expenses (e.g. *Seahorse program of General Health Insurance company in Czech Republic*). However, not everyone can afford such a stay more than once in a year.

I verified that the condition of patients with **asthma and inflammation of the upper and lower respiratory tract improved after 5-10 stays in salt cave** similarly like after a stay at the sea. **Positive effect lasts for approximately 3 months** and in comparison to expenses of four stays at sea, including medication needed to get patient into good fitness, the price for one stay in a cave is negligible. As an expert on lung diseases I cannot certify the influence of salt caves on other types of diseases. But for myself I can testify to the comfortable relaxing effects of salt caves.

7. Hospodarske Noviny, section Zdravie, 1st of August 2005

For asthmatics, visiting a salt cave can replace a curative stay at sea. Salt air attenuates allergic symptoms. Staying in the salt cave can help people with chronic snuffles, inflammation of nasopharynx or bronchitis. "The cave imitates the environment of natural salt mines or seaside regions where the air is enriched with salts and therefore attenuates inflammation of the upper and lower respiratory tract," Jiri Homolka explains. He suggests that visits must be repeated several times, the cave does not have a one-time effect.

8. M.D Vladimir Volf PhD. pediatrician, Children and youth clinic, third Medical School of Comenius University and Teaching hospital Kralovske Vinohrady, Praha, Czech Republic

When we say **salt**, we usually imagine a mineral, which we use in cooking and food preparation. But salt has also other important use. One of advantages of this mineral is its **healing effects**. Treatment of miscellaneous diseases in saline microclimate is carried out for many years. Method of inhalation of salt diffused in air was utilized already by **ancient Greek doctors**.

Pediatricians recommend stays at sea for children with difficulties with upper and lower respiration tract. Although we don't have a sea in the Czech Republic, we don't need to travel a long way to other countries to the sea in order to take advantage of sea-like climates. Alternatively a stay in **salt cave** comes into consideration. **Staying in a salt cave is a new, original, effective and cleanly natural method called halotherapy**. In a salt cave dominates a unique and inimitable climate, created by the presence of high amounts of salt which build up in the cave. The air in the cave is saturated with ions of iodine, calcium, magnesium, sodium, bromine, selenium and other trace elements which create microclimate which has an enormous positive influence for the treatment of a wide spectrum of diseases and remarkably **supports the immune system** for both **young and adult patients**. Another significantly positive effects of salt cave lie in the ability of inhaled salt aerosols to dry up microbial cells of pathogenous microorganisms which in turn leave the body in the form of released sputum from the respiratory tract. This effect is identified as a **self cleaning process of the organism**. Direct consequence of this self cleaning process is the



regression of the inflammation with changes not only in the **respiratory tract** but also in the whole organism.

From my praxis, I can acknowledge that staying in a salt cave significantly and positively influences the progression of diseases for **child patients with chronic upper and lower respiratory tract diseases (inflammation of pharynx, hay fever, asthma), skin diseases (atopic dermatitis), chronic diseases of digestion tract (Crohn's diseases, stomach ulcers), cardiovascular diseases (hypertension) or functional disorders of thyroid**. At the same time, the salt cave microclimate positively affects the **stability of the immune system** which constitutes very important preventive factors of **influenza diseases**, which pose an increased hazard these days.

We cannot neglect the effect of salt caves on a **child patients' psyche**, too. After entering the salt cave, one's enchanted by its captivating atmosphere. Salt is everywhere on walls and floor, mild light shines through salt stones on the walls, speakers play relaxing music...

A stay in a salt caves cannot be used as a causal treatment for child patients, only as a supplemental treatment. It is necessary to remember, that supplemental treatments have significant effects on the progression and prognosis of a number of diseases. Therefore this treatment should be considered for child patients also with the consideration of its financial requirements in comparison to climatotherapeutic stay at sea.

9. M.D. Aleksander Sielużycki, internist, balneotherapist, Jelenia Góra, Poland

During my last stay with my family in the salt cave in the city Jelenia Gora - Kaplice I started to think about the phenomenon of these facilities. The number of salt caves in Poland and Slovakia has significantly increased in the last years. Considering the high long-term popularity and the number of visitors, we have to admit that it's more than just a matter of style. An in-depth research on the effects of these caves' microclimate on human organism is necessary. I would divide visitors of these facilities in two groups.

The first group consists of patients who are ill and those long-time treated. They have a variety of difficulties: beginning with **diseases of the upper and lower respiratory tract, disorders of metabolism, endocrinal and digestion tract diseases, allergies, cardiovascular dysfunctions and related elevated blood pressure**.

Last but not least there are people with skin diseases like **psoriasis** and various types of **dermatitis**. The beneficial effects of staying in salt caves on these diseases and dysfunctions are unquestionable and can be proven. We also cannot forget the effect of this microclimate on the **nervous system** in the treatment of **neurosis, psychosomatic difficulties and a variety of phobias**. Similar kinds of treatments based on natural methods are nowadays carried out in most developed countries. These procedures are used as supplemental methods and definitely boost the effects of the treatments and consecutive convalescence.

Another group would consist of people without health problems. Each of us is affected by our environment. Eating irregularly and unhealthy foods, living in **never ending stress** and everyday haste reflect on our **fitness and mood**. We are **tired, apathetic and discontented**. A stay in a salt cave coupled with listening to relaxing music (calm whirl of the sea, bird songs or enjoyable instrumental music) acts as a balsam to our nerves. By these procedures we can talk about aromatherapy. The unique aroma of the sea salt enriched with various natural substances has invaluable effects on whole organism. That's the essence and secret of salt caves. We can find real seaside climates here. We feel the cave with all senses. The caves turn into a significant element helping in the treatment of many serious diseases. Their preventive function can reduce the chance of their formation.

To get back to the beginning of my reflection, if this is just a vogue then it should be generally accepted considering its positive and healing effect on human organisms. I don't think that one day we will be arranging our meetings in salt caves instead of pubs, but who knows?



10. M.D. Slavomira Feix, allergologist, has practical experience with natural salt caves from Germany

Category of atopic diseases of organisms consists of typical **skin diseases** together with diseases of the **respiratory tract**. The most important indications of respiratory tract diseases in **salt cave** are allergiologic diseases like **hay fever, allergic bronchitis, allergic asthma**, but also **chronic bronchitis, convalescence of whooping cough (pertussis)** and **chronic inflammation of sinuses**.

Speleotherapy is one of the reputable treatment methods for these kinds of diseases, moreover a **natural** one and as such, **reduces the risk of acute state genesis**. The ideal temperature, air humidity, high ionization, rich mineral microclimate and low, almost zero-level concentration of allergens allows patients, allergists in calm state, to significantly reinforce their respiratory tract and whole **immune system**. In acute states, the microclimate can reduce reaction to allergens and minimize medicaments needed.

Additional **colour therapy and music** create comfortable environments for **meditation** and **relaxation**. Regular stays at salt caves make up for seaside air and beneficially affect the befallen respiratory tract.

11. M.D. Zuzana Lukacova, dermatovenerologist, Teaching Hospital with Policlinic in Bratislava - Ruzinov, Slovakia

In treatment of some **skin diseases**, the seashores climatic conditions have been used for many years, which help in healing or significantly improving the healthy state of a patient, protection from the inability to work or in returning to workability. **Skin diseases**, positively affected by climatic conditions are **psoriasis, atopic dermatitis, chronic** and **recidivist dermatitis**.

A modern, fast lifestyle doesn't always allow us to drive off for seaside climate treatments for long periods of time and therefore **the popularity of the salt caves grows**. They offer the same therapeutic opportunities, but are close to our homes. Salt caves are made of large quantities of excellent quality of mineral salt, from which mineral I substances and trace elements are released at the right temperature and humidity, creating a unique microclimate saturated with important elements like iodine, copper, magnesium, iron, calcium, potassium and other minerals, which are indispensable for the healthy operation of organism. The specific microclimate of a salt cave has excellent effects not only on some skin diseases but also positively function with other diseases, like **allergic diseases, asthma, inflammation of nasal cavities, respiratory tract** and lastly **causes stress relief** and refreshing. For many positive effects I can only advise such a stay in salt cave.

12. M.D. Jaroslav Mikula, medical director, health spa, Piestany, Slovakia. Magazine Zdravie, November 2005

"Forty-five minute long stay in a salt cave is equal to three days at sea. Air is rich on disinfecting iodine, bromine, anti stress magnesium, anti allergic calcium, potassium or free radicals destroying selenium".

13. M.D. Dorota Wronska, laryngologist, Kielce, Poland

From the very beginning of service of the salt cave in the city of Kielce, not only me, but also my clients use these procedures. A unique microclimate reigns in the room. The air is saturated with elements like iodine, magnesium, potassium, chlorides, bromines, selenium and copper. Such amount of minerals and trace elements occurring in salt caves together with adequate temperature and humidity is necessary for the correct operation of the **upper and lower respiratory tract**. Therefore I recommend my **young** and **adult patients** to use the procedures offered in salt cave.

These procedures are appropriate for the recovery of an **inflammation of the nasal cavities, inflammation of the throat and larynx**. I especially recommend visiting a salt cave to people



with inflammation of the **tonsils** and long lasting inflammation of the throat, larynx and nasal cavities.

Thanks to the fact that the salt cave is located in my city, my patients can use these procedures all year round and don't need to wait for the summer months when they can travel to sea. I work as a laryngologist and I can't imagine treating patients with a more effective method without recovery procedure utilizing the effects of salt, above all for those, who have suffered from diseases of the respiratory tract for a long time.

14. Why athletes have a need for lung function improvement?

13.a. (Chest. 2005;128:3966-3974.) © 2005 American College of Chest Physicians "Exercise-Induced Bronchoconstriction in Athletes" Jonathan P. Parsons, MD and John G. Mastronarde, MD, FCCP.

13.b. Male Athletes More Likely to Develop Respiratory Symptoms Than Noncompetitors The study was funded by the Danish Lung Association, Team Denmark, and H:S Copenhagen.

ATS 99th International Conference: Abstract P637. Presented May 20, 2003. Reviewed by Gary D. Vogin, MD.

Athletes who participate in environments in which there may be environmental pollutants are at increased risk for the development of EIB (**Exercise-Induced Bronchoconstriction**). **Chlorine compounds in swimming pools** and **chemicals related to ice-resurfacing machinery in ice rinks** may put certain populations of athletes at additional **risk**. Particulate matter and gases such as **carbon monoxide and nitrogen dioxide**, which are abundant in **indoor ice arenas**, and **chlorine** from **swimming pools** may act as **allergic "triggers"** and may exacerbate **bronchospasm** in athletes who are predisposed to EIB. Helenius and Haahtela showed a 96-fold greater risk of **asthma** in atopic swimmers when compared to nonatopic control subjects when atopy and swimming were included in multivariate statistical analysis. Leuppi et al found a 35% incidence of airway hyperresponsiveness in a group of **ice-hockey players**. In addition, figure **skaters** have been shown to have a high incidence of EIB [**12.a**]. Although athletes who compete in high-ventilation or endurance sports are more likely to experience symptoms of EIB than those who participate in low-ventilation sports, EIB can occur in any setting. It is especially prevalent in endurance events such as **cross-country skiing, swimming, and long-distance running** in which ventilation is increased for long periods of time during training and competition, allowing for relatively more evaporative water loss and subsequent airway narrowing. There is also increased prevalence of EIB in **winter sports athletes**, which is thought to be due in part to the increased cooling of airways and the relative increase in reactive hyperemia in the pulmonary vasculature. It is important for **athletes, coaches, and trainers supervising athletes** in these "higher risk" sports to be aware of the increased incidence of EIB in these populations of athletes [**12.a**]. The prevalence rates of **bronchospasm** related to exercise in athletes range from 11 to 50%, and up to **90% of subjects with asthma will have EIB**. Wilber et al found that **18 to 26% of Olympic winter sport athletes and 50% of cross-country skiers were found to have EIB**. Of the 50 elite summer athletes studied, with and without asthma, Holzer et al found 50% to have EIB. Mannix et al studied 124 elite figure skaters and tested them on an ice rink during their figure-skating routines. Thirty-five percent had a significant post exercise drop in their FEV1. The US Olympic Committee reported an 11.2% prevalence of EIB in all athletes who competed in the 1984 summer Olympics, according to the article "Exercise-Induced Bronchoconstriction in Athletes"¹ Elite male athletes, especially **competitive swimmers, have an increased risk of wheezing, coughing, and other respiratory symptoms** as well as **increased risk of asthma**, according to Danish researchers who studied 62 athletes. Thomas Lund, MD, from Bispebjerg Hospital in Copenhagen, said more than a third of the athletes studied had respiratory symptoms and 21% had asthma [**12.b**].



Pharmacologic Therapy. The most common therapeutic recommendation for minimizing or preventing symptoms in athletes who have EIB is the prophylactic use of short-acting bronchodilators (ie, β_2 -receptor agonists) such as albuterol shortly before exercise. β_2 -agonists are considered to be the most effective therapy for the prevention of symptoms of EIB in asthmatic patients. Treatment with two puffs of a short-acting β_2 -receptor agonists shortly before (15 min) exercise will provide peak bronchodilation in 15 to 60 min and protection from EIB for at least 3 h in most patients. However, the overuse of β_2 -agonists has been shown to result in tachyphylaxis and to worsen symptoms of EIB and asthma.

Other non-pharmacologic approaches. Many athletes find that a period of pre competition **warm-up** reduces the symptoms of EIB that occur during their competitive activity. Athletes often draw this conclusion without any guidance from health-care specialists. Symptoms of EIB usually occur after a few minutes of exercise, and some athletes find that warming up before exercise acts as prophylaxis against more significant episodes of EIB during exercise. There are other non-pharmacologic strategies that athletes can employ to help reduce the frequency and severity of symptoms of EIB. **Wearing a facemask** during activity warms and humidifies inspired air when outdoor conditions are cold and dry, and is especially valuable to elite and recreational athletes who exercise in the winter. **Breathing through the nose** rather than the mouth will also help to ameliorate EIB by warming, filtering, and humidifying the air, which subsequently reduces airway cooling and dehydration. In addition, athletes with knowledge of triggers (i.e., freshly cut grass) should attempt to avoid them if possible.

15. Halotherapy for Sports Performance Enhancement Addressing pulmonary limitations to performance in sports

- 14.1 Mark Harries, ABC of Sport Medicine: Pulmonary limitation to performance in sport. *BMJ* 1994; 309:113-115(9 July)
- 14.2 Helenius, I, Haahtela, T Allergy and asthma in elite summer sport athletes. *J Allergy Clin Immunol* 2000; 106,444-452
- 14.3 Chervinskaya AV, Zilber NA. **Halotherapy for treatment of respiratory diseases.** *J Aerosol Med* 1995 Fall;8(3):221-232.
- 14.4 E.Daviskas, S.D. Anderson, I. Gonda, S. Eberl, S.Meikle, J.P. Seale, J. Bautovich. **Inhalation of hypertonic saline aerosol** enhances mucociliary clearance mechanism in asthmatic and healthy subjects. *Eur Respiratory J*,1996, 9, 725-732
- 14.5 Jonathan D. Finder. Airway Clearance in Pediatric Patients. *RT Magazine*. January 2006
- 14.6 J. Hedman, T. Hugg, J. Sandell, T. Haahtela. The effect of **salt chamber** treatment on bronchial hyperresponsiveness in asthmatics. *Allergy* 2006;61:605-610

Problem: finding natural, safe and effective approaches to improvement of lung function in athletes.

When you're an athlete, as you know every advantage counts. Halotherapy for Sports Performance Enhancement can help you get that edge over the competition. The primary goal of every athlete is to achieve their absolute maximum potential. One of the most important determinants of whether this is possible to improve their breathing pattern.

Poor breathing patterns will:

- Limit oxygen exchange
- Reduce stamina and performance
- Increase the production of lactic acid and subsequently leave the athlete with residual muscle soreness
- Increase dehydration
- Increase the occurrence of cramps



- Greatly lengthen recovery time
- Elevate the heart rate
- Increase anxiety
- Decrease concentration
- Increase the likelihood of injury in training and competition
- Decrease energy levels
- Contribute to poor sleep patterns

The aim of Halotherapy in Sports Program is to normalize the breathing pattern. When the body is working within its physiologically normal parameters it can work at an increased level of performance. Stamina and endurance are maximized and all of the above are reversed. Athletes find that once they have corrected their breathing pattern, they can achieve better performance with less breath. This means athletes would have more air in reserve and hence have increased as well as have optimal performance. When you want to win, you have to get that edge.

There are known respiratory conditions and pulmonary limitations among athletes:

- Air flow obstruction leading to performance reduction (14.1)
- Increased bronchial responsiveness (14.2)
- Exposure to airborne allergens and other unwanted inhaled particles (14.2)
- Respiratory illnesses and conditions such as asthma, allergy, airway inflammation (14.1, 14.2)

Solution: Pharmacologic and Nonpharmacologic Therapy

Pharmacologic therapy: ask your doctor

Nonpharmacologic therapy: One of the treatments which appear to successfully address the needs of athletes is dry saline aerosol inhalation, or known as **Halotherapy**, ideally performed at **Salt caves**.

Hypertonic saline aerosol inhalation treatment is clinically proven:

- To clear mucus from the airways thus removing airflow obstruction (14.3)
- To enhance mucociliary clearance mechanism in both asthmatic and healthy subjects (14.4)
- To balance airway-surface liquid (14.5)
- To provide anti-inflammatory and bactericidal effects (14.3)
- To reduce bronchial hyperresponsiveness (14.6)
- To improve lung function (3)
- To help clear unwanted inhaled particles from lungs (14.4)
- As a drug-free treatment for asthma, bronchitis, CF and sinusitis (14.3)

Thus, **integrating Halotherapy with other non-pharmacologic therapies can lead to better lung function and improved performance as well as both prevention and treatment of respiratory conditions among athletes.**

Sports Performance Enhancement program. The program involves:

- Naturopathic doctor assessment and supervision
- Preprogram lung function testing (Spirometry)
- **Halotherapy at a Saltcave**
- Nasal/sinus hydro pulse saline irrigation
- Respiratory muscle training (Breathing Resistance Exercise **ideally inside and outside a Salt cave**)
- Post program lung function testing



- Diet and nutrition recommendations

Program Results. Sports Performance Enhancement program can help:

- To treat existing respiratory problems naturally (14.3)
- To clear mucus from the airways thus removing airflow obstruction (14.3)
- To provide anti-inflammatory and bactericidal effects for respiratory system (14.3)
- To reduce bronchial hyperresponsiveness (14.6)
- To improve lung function (14.3)
- To help clear unwanted inhaled particles from lungs (14.4)
- To enhance mucociliary clearance mechanism (14.4) (Prevention treatments)

Respiratory muscle training can help:

- To increase lung capacity and endurance
- Strength of respiratory muscles
- To increase the volume of lung ventilation

Thus Sports Performance Enhancement program can improve pulmonary function, which in turn leads to a better performance in sports.

General Information. Typically, a program is based on 15 sessions, either 5 days per week for 3 weeks or 3 days per week for 5 weeks.

16. Inhalation of hypertonic saline aerosol enhances mucociliary clearance in asthmatic and healthy subjects by E. Daviskas, S.D. Anderson, I. Gonda, S. Eberl, S. Meikle, J.P. Seale, G.

Bautovich ©ERS Journals Ltd 1996.

ABSTRACT: Hyperosmolarity of the airway surface liquid (ASL) has been proposed as the stimulus for hyperpnoea-induced asthma. We found previously that mucociliary clearance (MCC) was increased after isocapnic hyperventilation (ISH) with dry air, and we proposed that the increase related to transient hyperosmolarity of the ASL. We investigated the effect of increasing the osmolarity of the ASL on MCC, by administering an aerosol of concentrated salt solution. MCC was measured using ^{99m}Tc -sulphur colloid, gamma camera and computer analysis in 12 asthmatic and 10 healthy subjects on three separate days, involving administration of each of the following: 1) ultrasonically nebulized 14.4% saline; 2) ultrasonically nebulized 0.9% saline; and 3) no aerosol intervention (control). The (mean \pm SD) volume of nebulized 14.4% saline was 2.2 ± 1.2 mL for asthmatics and 3.2 ± 0.7 mL for healthy subjects. This volume was delivered over a period of 5.4 ± 1.3 and 6.4 ± 0.7 min for asthmatic and healthy subjects, respectively. The airway response to 14.4% saline was assessed on a separate visit and the fall in forced expiratory volume in one second (FEV₁) was $22\pm 4\%$ in the asthmatic and $3\pm 2\%$ in the healthy subjects. Compared to the MCC with the 0.9% saline and control, the hypertonic aerosol increased MCC in both groups. In asthmatic subjects, MCC of the whole right lung in 1 h was $68\pm 10\%$ with 14.4% saline vs $44\pm 14\%$ with 0.9% saline and $39\pm 13\%$ with control. In healthy subjects, MCC of the whole right lung in 1 h was $53\pm 12\%$ with 14.4% saline vs $41\pm 15\%$ with 0.9% saline and $6\pm 13\%$ with control. We conclude that an increase in osmolarity of the airway surface liquid increases mucociliary clearance both in asthmatic and healthy subjects. These findings are in keeping with our previous suggestion that the increase in mucociliary clearance after isotonic hyperventilation with dry air is due to a transient hyperosmolarity of the airway surface liquid. *Eur Respir J.*, 1996, 9, 725–732.

17. Chervinskaya AV, Zilber NA. Halotherapy for treatment of respiratory diseases. Journal of Aerosol Medicine 1995 Fall;8(3):221-232.

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- b. Karakoca V, Demir G, Kisacik G et al. Speleotherapy in asthma and allergic diseases. *Clinical and Experimental Allergy* 1995;25: 666-67.



- c. Abdullaev AA, Gadzhiev KM, Eiubova AA. (The efficacy of Speleotherapy in salt mines in children with bronchial asthma based on the data from immediate and late observations). Vopr Kurortol Fizioter Lech Fiz Kult 1993 Sep-Oct;(5):25-8.
- d. Simonka-IuM, Chonka-Ia V, Pop IL. Effect of the microclimate of salt mines on T- and Blymphocytes function in bronchial asthma patients. Vrach Delo 1989; 3: 57-9.
- e. Mohap J, Bohac S, Weigl, E. Values of selected immunological parameters before and after Speleotherapy. Acta Univ Palacki Olomuc Fac Med 1991;131:197-211.
- f. Chervinskaya AV, Zilber NA. Halotherapy for treatment of respiratory diseases. J Aerosol Med 1995 Fall;8(3):221-232.
- g. P.P.Gorbenko, Adamova IV, Sinitsyna TM. Bronchial hyperreactivity to the inhalation of hypo and hyperosmolar aerosols and its correction by Halotherapy. Ministry of Public Health of the Russian Federation, Russian Pneumological Scientific Society Pulmonology, 1993;3(2).
- h. E.N.Semochkin, V.P. Silvestrov, V.N. Surovnikov. Halotherapy: Complex treatment in outpatients with breathing (respiratory tract) pathologies. Kremlin Medicine. Clinical Herald 1999;3.
- i. G.A.Norvaisa, D.Noreikiene. Halotherapy in management of endogenous bronchial asthma. Center for Halotherapy, Pulmonology Department, Hospital Red Cross, Klaipeda, Lithuania. Annual meeting, Interasthma, Palanga, Lithuania, May 28-30, 1999.

Speleotherapy or underground climatotherapy is a complementary/alternative treatment for **respiratory problems** used widely in Eastern Europe and Russia. It involves spending 2-3 hours a day underground in subterranean caves or salt mines over a 2-3 month period.

Speleotherapy has been recognized as an effective drug-free treatment method for certain types of chronic pulmonary diseases, such as **asthma** and **chronic obstructive pulmonary disease** (COPD).

Based on the therapeutic action produced by cave air saturated with particles of rock salt, this treatment has been shown to provide substantial benefits to patients with respiratory diseases. Published studies suggest that the efficacy of Speleotherapy may be related to its direct.

Immunological effects, either by increasing the number and activity of T-lymphocytes or altering complement levels. Halotherapy (HT) is a mode of treatment in a controlled air medium that simulates the natural **salt cave microclimate**. **HT is performed in a special room with salt-coated walls and floor – the 'Halochamber'**. Dry sodium chloride aerosol containing particles of 1-5 μm in size is produced by a special nebulizer and released into the Halochamber. The effect of HT was evaluated in 124 patients with various types of respiratory diseases (bronchial asthma, chronic obstructive and non-obstructive bronchitis, bronchiectasis, cystic fibrosis) in a placebo-controlled clinical trial. HT resulted in significant clinical improvements as measured by various lung function tests (flow-volume loop parameters, body plethysmography, bronchial resistance) compared to placebo⁶. Other studies have reported similar benefits in patients with chronic pulmonary disease. The Russian Ministry of Health approved the Halocomplex Chamber as a medical device in 1995. Most of the published work on Halotherapy has appeared in Russian journals and publications.

18. HALOTHERAPY FOR TREATMENT OF RESPIRATORY DISEASES, ALINA V. CHERVINSKAYA and NORA A. ZILBER, Saint-Petersburg Pavlov National Medical University, Russia, Joint- Stock Company Aero med, Saint-Petersburg, Russia.

ABSTRACT. This work elucidates the questions upon the development of a new drug-free method for respiratory diseases treatment. Halotherapy (HT) - is a mode of treatments in a controlled air medium which simulates a natural **salt cave microclimate**. The main curative factor is the dry sodium chloride aerosol with particles of 2 to 5 μm in size. Particles density (0.5-9 mg/m^3) varies with the type of the disease. Other factors are: comfortable



temperature, humidity regime, the hypo bacterial and allergen- free air environment saturated with the aerosol.

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 the patients.**

In the overwhelming majority of cases, the number and intensity of **asthma attacks and respiratory discomfort decreased or disappeared, which allowed, in a number of cases, to cancel or reduce the dosage of beta-agonists.**

The similar clinical results were obtained in other investigations. Efficacy of this method has been noted in pts with various pathogenic variants of BA, **chronic bronchitis, acute bronchitis, bronchiectasis, upper airways diseases**, etc. (Alexandrov & Chervinskaya et al, 1994, Chervinskaya et al, 1993, 1994, Norvaishas et al, 1992, Pokhaznikova et al, 1992, Telyatnikova et al, 1992, Tikhomirova et al, 1993).

In our investigation the improvement in the clinical state of pts was accompanied by positive dynamics of the functional measurements. HT gave significant improvement in bronchial patency which started on the 7th day and persisted to the end of the course. There was no direct bronchospasmolytic effect. The dynamics of bronchial patency depended upon the initial extent of obstruction: the more marked was the bronchial obstruction, the better were the results of HT. The effect depended not upon the character of obstruction (reversible or irreversible).

19. Chervinskaya AV, Zilber NA. Halotherapy for treatment of respiratory diseases. J Aerosol Med. 1995 Fall;8(3):221-32. Complete study is available. PMID: 10161255 [PubMed - indexed for MEDLINE]

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 treatment the respiratory diseases are discussed.

20. Gorbenko PP, Adamova IV, Sinitsyna TM. [Bronchial hyperreactivity to the inhalation of hypo- and hyperosmolar aerosols and its correction by halotherapy]. Ter Arkh. 1996; 68(8):24-8. Russian. Abstract is available PMID: 9019826 [PubMed - indexed for MEDLINE]

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.

21. Grigor'eva NV. [Halotherapy in combined non-puncture therapy of patients with acute purulent maxillary sinusitis]

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.

22. Vestn Otorinolaringol. 2003;(4):42-4. Russian. Abstract is available. PMID: 13677023 [PubMed - indexed for MEDLINE]. Abstract is available PMID: 9019826 [PubMed - indexed for MEDLINE]

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.

23. Abdrakhmanova LM, Farkhutdinov UR, Farkhutdinov RR. [Effectiveness of halotherapy of chronic bronchitis patients]. *Vopr Kurortol Fizioter Lech Fiz Kult.* 2000 Nov-Dec ;(6):21-4. Russian. Abstract is available PMID: 11197648 [PubMed - indexed for MEDLINE]

The chemoluminescence test in 49 patients with lingering inflammatory chronic bronchitis has revealed inhibition of generation of active oxygen forms in the whole blood, intensification of lipid peroxidation in the serum, depression of local immunity. Administration of halotherapy to the above patients results in correction of disturbances of free-radical oxidation, improves local immunity and clinical course of the disease.

24. Maev EZ, Vinogradov NV. [Halotherapy in the combined treatment of chronic bronchitis patients] *Voen Med Zh.* 1999 Jun; 320(6):34-7, 96. Russian. Abstract is available PMID: 10439712 [PubMed - indexed for MEDLINE]

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.

25. Chernenkov RA, Chernenkova EA, Zhukov GV. [The use of an artificial microclimate chamber in the treatment of patients with chronic obstructive lung diseases]. *Vopr Kurortol Fizioter Lech Fiz Kult.* 1997 Jul-Aug ;(4):19-21. Russian. Abstract is available PMID: 9424823 [PubMed - indexed for MEDLINE]

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.



26. **Chervinskaia AV.** [The scientific validation and outlook for the practical use of halo-aerosol therapy]. *Vopr Kurortol Fizioter Lech Fiz Kult.* 2000 Jan-Feb ;(1):21-4. Review. Russian. **Abstract is available PMID: 11094875 [PubMed - indexed for MEDLINE]**

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.

27. **Farkhutdinov UR, Abdrakhmanova LM, Farkhutdinov RR.** [Effects of halotherapy on free radical oxidation in patients with chronic bronchitis] *Klin Med (Moscow).* 2000;78(12):37-40. Russian. **Abstract is available PMID: 11210350 [PubMed - indexed for MEDLINE]**

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

28. **Borisenko LV, Chervinskaia AV, Stepanova NG, Lukian VS, Goncharova VA, Pokhodzei IV, Krivitskaia VZ, Vishniakova LA, Pokhaznikova MA, Faustova ME, et al. Maliavin AG, Filaeva IuA, Umakhanova MM, Chervinskaia AV** [The use of halotherapy for the rehabilitation of patients with acute bronchitis and a protracted and recurrent course]. *Vopr Kurortol Fizioter Lech Fiz Kult.* 1995 Jan-Feb ;(1):11-5. Russian. **Abstract is available PMID: 7785211 [PubMed - indexed for MEDLINE].**

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.

29. **Roslaia NA, Likhacheva EI, Shchekoldin PI.** [Efficacy of therapeutic use of ultrasound and sinusoidal modulated currents combed with halotherapy in patient with occupational toxic-dust bronchitis] *Vopr Kurortol Fizioter Lech Fiz Kult.* 2001 Jan-Feb ;(1):26-7. Russian. **Abstract is available PMID: 11530404 [PubMed - indexed for MEDLINE]**

Immunological and **cardio respiratory** 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.

30. Maliavin AG, Filiaeva IuA, Umakhanova MM, Chervinskaia AV. [Halotherapy-a new treatment of bacterial vaginosis] *Vopr Kurortol Fiziofer Lech Fiz Kult.* 2004 May-Jun ;(3):35-7. Russian.

The analysis was made of clinical efficacy, some mechanisms of a therapeutic action and techniques of halotherapy used for the first time in the treatment of **bacterial vaginosis**. High efficacy, long-term aftereffect and advantages of halotherapy vs drug therapy are shown.

31. Diabetes Treatment With Cupping And Pure Salt Therapy

By Mohd Hashim Shaari

There are two types of diabetes namely diabetes insipidus and diabetes mellitus.

Diabetes insipidus is a rare metabolic disorder in which the patient produces large quantities of urine and is constantly thirsty. It is due to a deficiency of the pituitary hormone vasopressin, an antidiuretic hormone which regulates reabsorption of water in the kidneys. Treatment is by administration of vasopressin to the patient and cannot be treated by Cupping and Pure Salt therapy (**Comment [b1]: Salt Therapy in this paper is not the inhale of salt microelements inside a Salt cave.**) as the pituitary glands are located deep inside the brain.

Diabetes mellitus affects about 7% of the general population and can be divided into type 1 (insulin-dependent) and type 2 (non insulin-dependent). Type 1 accounts for about 10% while type 2 represent 90 % of all diabetes mellitus. Type 1 normally affect children and teenagers which have little or no ability to produce the hormone insulin and patients are entirely dependent on insulin injections for survival. The hormone insulin is produced by the pancreas and helps to regulate the blood sugar level when it exceeds the preset limit. **It is thought that type 1 is caused by damage to the pancreas tissues that produce insulin due to misplaced attack of the pancreas by the patient's own immune system (autoimmune attack).** Cupping and Shin Gum Pure Salt therapy cannot treat type 1 because of permanent damage to the pancreas. (**Comment [b2]: With an saltcave inside the house, the immune system will be stabilized and will not attack the pancreas**)

Type 2 being the most common diabetes was prevalent amongst patients in the middle and old age. However, in recent years the number of young people suffering from type 2 diabetes has increased. It can be found in young people in the twenties and thirties. Type 2 diabetes is due to inadequate production of insulin to meet the needs of the patient or the result of the body becoming resistant to the effects of insulin. The accumulation of sugar leads to its appearance the blood (hyperglycaemia) and then in the urine. Symptoms include thirst, excessive production of urine, aging and itching skin, loss of sensation, loss of teeth, blurring of vision, constant hunger, and lost of weight due to the use of body fats as an alternative source of energy to sugar. Risk factors include incidence in family members (genetics), obesity, lack of exercise, sedentary lifestyle, diabetes during pregnancy and unhealthy eating habits (too much sugar, excessive carbohydrates, overeating).

Long term complications of type 2 diabetes include higher risk of heart attack (myocardial infarction) and stroke attack (cerebro vascular accident), highest incidence of blindness due to damage of blood vessels supplying the optic nerve (diabetic retinopathy), highest cause of kidney failure requiring dialysis (diabetic nephropathy), thigh pain and progressive weakness of knee extension (diabetic amyotrophy), pain or numbness of the feet due to nerve damage



(diabetic neuropathy), amputation of legs due to gangrene, and impotence due to damage nerves of the penis (erectile dysfunction).

Type 2 diabetes can be treated with cupping of points 2, 3, 6 and 8 with only 30% success rate due to the fact that the pancreas are located deep inside the viscera behind the liver. However, a much higher success rate is achieved by applying Aggressive Cupping **combine with Pure Salt therapy**. For diabetes type 2 Pure Salt therapy comprise of daily one hour exercise, gradual reduction of food followed by fasting, daily pure salt half body bath**(Comment [b3]: Or stay inside a Saltcave!)**, consumption of pure salt (preferably 200 hour pure salt or minimum 30-hr pure salt), stress reduction techniques and adopting a positive mental attitude to diabetes.