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Therapeutic Effect of Chronic Simple Rhinitis by Halotherapy

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ABSTRACT

Background: *It was first officially recognized as a therapy in 1843 by Polish physician Dr. Feliks Boczkowski, who noticed that the salt mine workers rarely suffered from respiratory issues. It is said that habitual halotherapy was of benefit to therapy of several disease including allergy, asthma, bronchitis, cold, chronic obstructive pulmonary disease, cystic fibrosis, pneumonia, chronic rhinitis, paranasal sinusitis, cough, snore and sleep apnea syndrome, stress, fatigue and vasomotor rhinitis. Halotherapy recently was used for almost respiratory disease and has got good effect of allergy, ENT and skin disease for a long time. Halotherapy as a main/assistant therapy has good effect of ENT diseases, which is anti-inflammatory and decrease of edema on mucous membrane of nose, larynx and Paranasal sinusitis and immune-response modulating effect.* ***Purpose:*** *To find the clinical effect of chronic simple rhinitis by halotherapy* ***Object and method:*** *90 patients with chronic simple rhinitis were included in this study.(male 48, female 42)* ***Conclusion:*** *Clinical effect of chronic simple rhinitis by halotherapy was 84.4%. Discussion: Halotherapy was benefit of therapy for chronic simple rhinitis.*

Keywords: Halotherapy, Rhinitis, Dry salt aerosol.

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INTRODUCTION

It was first officially recognized as a therapy in 1843 by Polish physician Dr. Feliks Boczkowski, who noticed that the salt mine workers rarely suffered from respiratory issues. German researchers compiled data on positive influence of prolonged staying of many people in the cave of Clutter that was used during the Second World War as a bomb shelter. At that time, many patients with bronchial asthma and chronic bronchitis demonstrated complete resolution of the diseases or considerable improvement of their condition. (9, 8, 15)

Some therapy methods with hypertonic saline were suggested and some successes were achieved in study of method nebulizing and inhaling hypertonic saline.

Nebulized hypertonic saline fails to arrive to anatomical target region and can sometimes cause bronchospasm in the case of exceed inhalation. (11, 12). Dry salt aerosol lies down on mucous membrane of respiratory system longer than aerosol with hypertonic saline, leading to high rate of absorption. (10, 11)

Super Absorbent (5, 11)

Dry salt acts like a sponge attracting foreign substances along its path through the respiratory tract. The dry salt can be imagined behaving like a toothbrush that cleans the respiratory system removing the build-up of foreign elements that cause various respiratory ailments and conditions Dry salt aerosol is also very hygroscopic. As quickly as it can, it attracts as much moisture as possible. When salt particles are inhaled and deposited on the mucus on the bronchial tree, the mucus is liquefied, which facilitates its easy expectoration. Sputum is loosened and can then be removed by coughing. The obvious advantage of this is that any blocking of the airways caused by the mucus is removed. Dry salt aerosol also works as a mucus-kinetic agent and can increase the effectiveness of a

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cough, either by increasing expiratory cough airflow or by unsticking highly adhesive secretions from the airway walls. Salt stimulates the bronchial self-cleaning mechanism and therefore, can act as an expectorant. This slight stimulation removes the mucus faster.

Anti-Inflammatory (5, 11)

Inhaled dry salt particles may help to reduce inflammation in the entire respiratory tract and widen the airway passages. Clinical studies have found that the inhalation of dry salt aerosol results in decreased colonization of pathogenic bacteria flora. A clean respiratory system naturally results in higher oxygen intake, increased energy, and an improved immune system. Clinical studies found that inhaled dry salt particles in the airway passages released discharge in airway, leading to remove the inflammation on the focus. (9, 10, 16)

Anti-Bacterial - The dry salt particles act as an anti-bacterial agent, dissolving bacteria and pollutants lodged in the respiratory tract. These are then either coughed up or naturally expelled by the body. (13, 16)

IgA and lactophenin increased in bronchial discharge after inhalation of dry salt aerosol than before and high level of catecholamine and histamines returned to normal.(7, 8)

Surface energy of dry salt aerosol is higher than of saline solution and ionized molecules of dry salt aerosol irrigate mobilization of epithelial cells of respiratory organs. (20)

It is said that habitual halotherapy was of benefit to therapy of several disease including allergy, asthma, bronchitis, cold, chronic obstructive pulmonary disease, cystic fibrosis, pneumonia, chronic rhinitis, paranasal sinusitis, cough, snore and sleep apnea syndrome, stress, fatigue and vasomotor rhinitis. (7, 5, 19)

Halotherapy recently was used for almost respiratory disease and has got good effect of allergy, ENT and skin disease for a long time. (1)

Halotherapy as a main/assistant therapy has good effect of ENT diseases, which is anti-inflammatory and decrease of edema on mucous membrane of nose, larynx and paranasal sinusitis and immune-response modulating effect. (7). One researcher also reported that halo therapy as an assistant has remarkable good effect on 72~87% of patients with vasomotor and allergic rhinitis and on 90% of patients done puncture with acute Para nasal sinusitis (2)

Nowadays, several therapy methods with halotherapy currently used in other countries.

OBJECT AND METHODS

1) Object

90 patients diagnosed with chronic simple Rhinitis(male 48, female 42)

2) Method

-The patients in study group inhaled dry salt aerosol 20cm apart from mobile aerosol generator for 30 minutes.

The patients in control group inhaled aerosol of 0.9% saline solution for 30 minutes.

Duration of therapy was 20 days. (1, 3, 5)

Therapeutic effects of halotherapy was assessed with compare of symptoms score reducing index of subjective and objective symptoms between pre-therapy and post-therapy. (17, 21)

$$SSRI = \frac{total\ score\ of\ symptoms\ of\ pretherapy - total\ score\ of\ symptoms\ of\ posttherapy}{totap\ score\ of\ symptoms\ of\ pretherapy}$$

Improvement rate(%)= SSRI×100%

Excellent: improvement rate>51%

Good: 21% <improvement rate<50%

Fair: improvement rate<20%

RESULTS

1) Average score in subjective symptoms

Average score difference of nasal obstruction between pre-therapy and post-therapy was significantly higher in study group than in control group.($p<0.01$, table 1.

Table 1. Average score of nasal obstruction (±SD, score),($p<0.01$) .

Average score difference between pre-therapy and post-therapy	
Study group (n=45)	**1.2±0.7****
Control group (n=45)	**0.5±0.5**

Average score difference of rhinorrhea between pre-therapy and post-therapy was significantly higher in study group than in control group, ($p<0.01$, table 2.)

Table 2. Average score of nasal obstruction (±SD, score), (p<0.05).

Average score difference between pre-therapy and post-therapy	
Study group (n=45)	1.0±0.7**
Control group (n=45)	0.6±0.6

Average score difference of total subjective symptoms between pre-therapy and post-therapy was significantly higher in study group than in control group.(p<0.01, table 3.)

Table 3. Average core of total subjective symptoms (±SD, score), (p<0.05).

Average score difference between pre-therapy and post-therapy	
Study group (n=45)	2.2±1.1**
Control group (n=45)	1.1±0.6

2) Average score in objective symptoms

Average score difference of inferior turbinate swelling was significantly higher in study group than in control group. (p<0.05, table 4).

Table 4. Average score of inferior turbinate swelling (±SD, score)

Average score difference between pre-therapy and post-therapy	
Study group (n=45)	0.9±0.9*
Control group (n=45)	0.5±0.5

Average score difference of amounts of nasal discharge was significantly higher in study group than in control group. (p<0.01, table 5)

Table 5. Average score of amounts of nasal discharge (±SD, score), (p<0.05).

Average score difference between pre-therapy and post-therapy	
Study group (n=45)	1.1±0.8**
Control group (n=45)	0.5±0.5

Average score difference of total objective symptoms between pre-therapy and post-therapy was significantly higher in study group than in control group. (p<0.01, table 6.)

Table 6. Average score of total objective symptoms (±SD, score),(p<0.05).

Average score difference between pre-therapy and post-therapy	
Study group (n=45)	2.0±1.4**
Control group (n=45)	1.0±0.7

2) Therapeutic effect

Therapeutic effect of chronic simple rhinitis by halotherapy shows table 7.

Therapeutic effect	Excellent	Good	Fair	Efficiency rate
Study group (n=45)	18 (40.0)	20 (44.4)	7 (15.6)	84.4**
Control group(n=45)	1 (2.2)	25 (55.5)	19 (42.3)	57.7

():%, **; p<0.01(compare study group to control group)

Efficiency rate was significantly higher as 84.4% in study group than in 57.7% in control group.(p<0.01)

DISCUSSION

Chronic simple rhinitis is treated by conventional method or intervention. The intervention is applied if signs didn`t get improved despite of conventional therapy for 6 months or 1 year. Duration of conventional therapy is different with cause and severe of rhinitis and therapy drugs including anti-histamines, steroids, decongestant and anti-cholinergics, which occasionally have side effects in the case of long-use. Nasal gargling which signs of rhinitis got improved was frequently recommended for management of chronic simple rhinitis but entrance of gargling solution into nasal cavity can cause discomfort and otitis media with effusion.

Now studies to apply the non-drug, noninvasive, natural method for the treatment of simple rhinitis has actively taken and reported its efficiency and recently due to Covid-19 spread, this is more strongly archived.

Halotherapy which has been known as concave therapy or salt therapy long ago, and used for several disease therapy has been actively used for upper airway disease including chronic simple rhinitis in other countries. Inhalation therapy with 0.9% saline solution was applied in control group and its efficiency between study group and control group was compared.

Difference score between pre-therapy and post-therapy for subjective symptoms was 2.2±1.1 in study group and 1.1±0.6 in control group. ($p<0.01$), Difference score between pre-therapy and post-therapy for objective symptoms was 2.0±1.4 in study group and 1.1±0.7 in control group. ($p<0.01$)

Therapeutic effect was 84.4%; 18 of 45 patients (40.0%) was excellent, 20 of 45 patients (44.4%) was good, 7 of 45 patients(15.6%) was fair.($p<0.01$)

CONCLUSION

Therapeutic Effect of Chronic simple Rhinitis by Halotherapy was 84.4%.

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