

## Investigation the Lifestyle in Patients with Cystic Fibrosis According to Iranian Traditional Medicine

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### Abstract

Respiratory involvement in cystic fibrosis (CF) is one of the most complaints in pulmonary disorders. Though symptomatic treatment of the patients with chemical medications is efficient in sign reduction, medications side effects and permitting the disease to become chronic are precarious for patients. Today, the World Health Organization considers traditional medicine. Iranian Traditional Medicine (ITM) makes a priority for disease prevention by suggesting some strategies.

We intended to investigate the lifestyle effect on cystic fibrosis patients. In this review, we searched the most important ITM sources [such as Qanoon fi al-teb (The canon of medicine), Zakhire-Kharazmshahi ,and Exir-Azam], and scientific databases such as Data sources included (Pub Med and Google Scholar] in English and without time restriction from inception up to April 2020.

According to ITM, the six essential principles must be observed in the management of patients with thick and sticky airway secretions that include nutritional pieces of advice about food and drink, exercise quality, evacuation and retention quantity, advising calmness, no prolonged and daytime sleep and avoidance from air pollution. An unhealthy lifestyle can play an important role in these patients that confirmed by classical medicine. Therefore, further clinical trials should be performed to confirm the long-term efficacy of a healthy lifestyle in cystic fibrosis patients' management.

**Key Words:** Children, Cystic Fibrosis, Iranian Traditional Medicine, Lifestyle.

\*Please cite this article as: Sadr S, Tahermohammadi H, Kaveh Sh. Investigation the Lifestyle in Patients with Cystic Fibrosis According to Iranian Traditional Medicine. Int J Pediatr 2021; 9(5): 13551-557. DOI: [10.22038/ijp.2020.51785.4122](https://doi.org/10.22038/ijp.2020.51785.4122)

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Received date: Nov.11, 2020; Accepted date: Jan.22, 2021

## 1- INTRODUCTION

Cystic fibrosis is an autosomal recessive disease (1). Which occurs due to mutations in the cystic fibrosis transmembrane conductance regulator (CFTR) (2, 3). The incidence of this disease is one in every 2000 to 3000 live births (4). The CFTR is located at the apical surface of epithelial cells covering the airway, intestines, and exocrine glands surface sites responsible for the transport of salt and water (5). Because of its mutation, airway, bile ducts, pancreas, intestines, and reproductive system secretions become thick and sticky (4, 6, 7). Although it is generally a multi-organ disorder, progressive pulmonary involvement is a major cause of morbidity and mortality for most patients (7-9) and the main cause of morbidity and mortality in these patients is an infection caused by *Pseudomonas aeruginosa* and chronic pulmonary infections (10, 11).

CF is a progressive disease that affects a patient's pulmonary function, which can affect patients' quality of life, and a study showed that the disease affects the quality of life of patients due to functional limitations (12). Patients with chronic diseases due to the complexity of the drug regimen and the daily time required to treat have about 50% compliance for treatments so the therapeutic protocols should be tailored to the individual needs of patients, adapting therapeutic goals as needed, and changing the lifestyle of patients (13). In recent years, the use of traditional and complementary medicine to reduce the symptoms of CF has been considered by health care providers and about 66% of patients with CF have used one of the alternatives and complementary methods (14, 15). Traditional and complementary medicines are sources of new and usually natural medicines. Among different traditional systems of medicine, Iranian Traditional Medicine (ITM) is one of the oldest and most worth ones (16, 17).

ITM history referred thousands of years ago (18). It flourished with the efforts of Iranian Muslim physicians like Avicenna (980–1037AD), and many others in early medieval periods (19, 20). Many of their manuscripts, like the Canon of Avicenna, were some of the main medical reference books in western and eastern Universities until the 17th century AD (16). Their important texts were written, and used in Iran, until the 18th century. Therefore, the subjects or medications mentioned in these books from the 10th to the 18th century can have at least 800 years of support among trials and examinations by various Iranian physicians (21). In this essay, we aimed to mention some effective factors in lifestyle, which ITM has recommended for thick and sticky airway secretions management as well as its effects according to recent studies.

## 2- MATERIALS AND METHODS

### 2-1. Search strategy

In this study, we have tried to introduce a proper lifestyle recommendation for CF patients from the ITM perspective as the complementary treatment for CF; this recommendation is frequently mentioned in many Iranian historical medical books such as Qanoon fi al-teb, Zakhire-Kharazmshahi, and Exir-Azam. Relevant data on mentioned subjects and CF is also reviewed, all clinical trials about ITM lifestyle factors affecting cystic fibrosis were searched in English in scientific databases such as Data sources included (Pub Med and Google Scholar) without time restriction from inception up to April 2020. The combination of keywords such as (air pollution, nutrition management, nutritional deficiencies, exercise, massage, chest physiotherapy, singing, yoga, self-hypnosis, relaxation, sleep), and cystic fibrosis were searched.

### 2-2. Included studies

Due to the limited number of published randomized controlled trials (RCTs) in the literature, all the clinical studies in this topic have been done yet, were included. Studies published in English up to April 2020. Articles with incomplete data and from other languages were excluded.

### **2-3. Selection process**

At first, one of the authors evaluated the searched articles, and then chose the relevant studies independently. Finally, the articles that met the inclusion criteria were enrolled in the review, and relevant references were evaluated to find further studies. The second and third authors resolved any discrepancies.

## **3- RESULTS**

There is no CF disorder in ITM sources, but due to the production of thickened secretions in the body ducts, it is classified in the group of diseases caused by the production of thick and sticky secretions. In this essay, we have mentioned some effective factors in lifestyle, which Avicenna has recommended for thick and sticky airway secretions management as well as its effects according to recent studies (22, 23).

### **3-1. Factors causing pulmonary symptoms According to the ITM**

**3-1-1.** Presence of thick and sticky mucus or sputum in respiratory tracts

**3-1-2.** Presence of thick and sticky mucus in internal body spaces such as stomach and intestine

**3-1-3.** Liver and brain hypofunction

Resolving of pulmonary symptoms in each case of CF requires the elimination of the cause, which is different for each case. According to ITM recommendation, some problems in the stomach, liver, uterus, intestines, and brain can be responsible for the development of pulmonary symptoms. Thus, it is so important to completely

examine all organs in patients suffering from pulmonary symptoms in CF (22, 23).

### **3-2. Lifestyle modification for pulmonary symptoms in CF from ITM perspective**

We found the following results in ITM manuscripts and recent studies about lifestyle in patients with CF:

#### **3-2-1. Air pollution**

Air pollution is a contributing factor to the symptoms of exacerbation of the chronic pulmonary disease. Pro-inflammatory components and inhaled gases that enter the lungs due to air pollution are associated with exacerbation of chronic lung disease (24). Exacerbation of pulmonary disease in CF contributes to disease progression by affecting the quality of life, costs, and pulmonary function. A study showed that the increased risk of antibiotic use was associated with an increase in nitric oxide and ozone on the day of infection, and it was found that nitric oxide plays an exacerbation trigger (25). A study showed that air pollution increases the risk of pulmonary exacerbation and decreases pulmonary function in CF patients (26). In addition, the role of air pollution as a factor that increases the probability of airway infections in CF patients discussed in a study indicating that small air components are an independent risk factor for early acquisition of Methicillin Resistance *Staphylococcus aureus* (MRSA) in children with CF (27). Also according to the ITM recommendation, air pollution is prohibited from patients with respiratory diseases (22).

#### **3-2-2. Food and drinks**

Nutrition management is an important part of caring for children with CF and its main purpose is to improve the normal weight and development of patients (28-30). Nutritional deficiencies remain a big concern in CF patients and it accrues due

to the CFTR mutation which results in the production of abnormally thick mucus affecting the digestion and absorption of nutrients, in particular, fat and fat-soluble vitamins and preventing digestive enzymes from entering the intestine. This consequently results in the food not being digested or absorbed properly, leading to malabsorption and maldigestion (31). Some ITM nutritional pieces of advice, such as the eating of fermented bread, with additives like hyssop and thyme, small freshwater fish, and small birds are good sources of protein for these patients. According to ITM, Chickpea is one of the main suitable food for the lungs. Drinking beverages should be slow, and water or other beverages should be avoided after meals. Also drinking the honey syrup has been recommended for these patients. Also, ITM emphasized that food and drink should not be used at the same time and a time interval between them should be considered (22, 32).

### **3-2-3. Exercise**

According to ITM massage of the chest with or without oil has also been recommended to dilute and eliminate thick and sticky mucus in some patients. Singing (starting from a low tone and gradually increasing the volume, strength and length), and mild exercise by patients' ability is so helpful (22, 32). In the treatment of patients with CF, the emphasis has also been placed on thoracic physiotherapy (33-36) for excreting airway secretion easier. Also, the studies have been conducted to evaluate the effect of exercise on symptoms of patients with CF in different age groups expressing increased airway capacity and pulmonary function in these patients (37), and a study which was done to evaluate the effect of respiratory muscle feedback and respiratory retraining (BRT) on pulmonary function in CF patients showed a significant increase in the forced expiratory volume in one second (FEV1),

and forced vital capacity (FVC) cases (38). In addition, one study showed that yoga reduces the degree of anxiety and joint pain (39). A study that was done to investigate the effect of yoga showed that the Cystic Fibrosis Questionnaire-Revised (CFQ-R) respiratory domain score was increased (40). One study showed that singing can improve the physical and psychological aspects of health in young people with CF (41), and a study indicated that singing has the potential to improve the respiratory status and quality of life of young people with CF (42).

### **3-2-4. Stress**

Cognitive and behavioral factors play an important role in the emotional health and management of patients with severe chronic conditions (43). A study conducted to investigate the effect of Self-hypnosis on disease-related disorders in patients with CF showed that 61% relaxation, 31% pain relief associated with medical procedures, 16% pain relief, and 18% controls other symptoms associated with CF happened (44). In a study which was done to investigate the effect of massage on reducing anxiety in parents and children with CF, showed Mood and peak airflow readings also improved for children in the massage therapy group (45).

### **3-2-5. Evacuation and Retention**

In CF, as a disease of dense secretory origin, changes in the thickness of the duct secretions of the body are essential for the excretion of the material (46). To reach this goal mucolytic agents are used to clean respiratory secretions such as DNase and inhaled hypertonic saline (47-50) and to facilitate material withdrawal from the airways, massage (46) or chest physiotherapy can be used (33-36). According to ITM, pay attention not to have constipation is so important to relieve respiratory signs and symptoms such as thick and sticky secretions to eliminate the

secretion one of the ways is through the gastrointestinal tract (22, 51).

### **3-2-6. Sleep**

According to the ITM sources, the patient with thick and sticky airway secretions should avoid prolonged sleep, especially after meals and daytime sleep (51). According to ITM, sleeping shortly after a meal should be avoided because it is very dangerous for these patients unless the cause is exhaustion. Also, a short nap is recommended (22, 23, 32).

## **4- CONCLUSION**

According to the principles of the ITM, treatment of thick and sticky airway and intestinal secretions in diseases such as cystic fibrosis requires specific attention to lifestyle and modifications of consumption of foods and drinks, sleep regulation, controlling stress, enough physical activity and avoiding air pollution. ITM also provides guidelines for easier excretion of thick and sticky airway discharge, the first step of which, along with drug therapy, is lifestyle modification, which we have discussed in this article. Air pollution has been reported as an exacerbation trigger of pulmonary symptoms and airway infection in patients with CF in both ITM and new studies. Also, nutrition management is an important part of caring for children with CF and its main purpose is to improve normal weight and improve the development of patients that in this part of the lifestyle, some food such as fermented bread, with additives such as hyssop and thyme, small freshwater fish, small birds, and chickpea are advised for this type of pulmonary disease from ITM. In recent studies, the effects of exercise and physiotherapy on improving pulmonary function in patients with CF have been shown, in traditional medicine sources also recommend guidelines of exercise and massage for assimilating residual wastes in the body. New studies have shown that the effects of yoga and massage to alleviate

stress and relaxation in patients. According to ITM, pay attention to lack of constipation is so important to relieve respiratory signs and symptoms such as thick and sticky secretions to eliminate the secretion one of the ways is through the gastrointestinal tract. In addition, these patients should avoid prolonged sleep, especially after meals and daytime sleep. It seems that paying attention to different aspects of lifestyle together and educating patients with CF and advising them to follow them can lead to the improvement of quality of life and reduction of pulmonary symptoms in patients with CF.

## **5- AUTHORS' CONTRIBUTIONS**

All authors contributed proportionately to this work.

## **6- ACKNOWLEDGMENTS**

This research was derived from an ongoing PhD thesis at the School of Traditional Medicine, Shahid Beheshti University of Medical Sciences.

## **7- CONFLICT OF INTEREST:** None.

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