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Clinical study of the impact of psychogenic shortness of breath and cough on human life

Abstract

Life of modern human is associated with frequent emotional overstrain and stress, which causes psychogenic cough and shortness of breath. The symptoms of psychogenic respiratory disorders lead to anxiety which become obsessive.

Keywords: psychogenic cough, psychogenic shortness of breath, hyperventilation, psychogenic respiratory disorders

Volume 10 Issue 1 - 2025

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Received: November 28, 2024 | **Published:** February 5, 2025

Introduction

The main cause of psychogenic cough and shortness of breath is chronic stress, emotional overstrain, anxiety and depression which often accompany modern life. It requires detailed study of physiological, clinical and epidemiological aspects of psychogenic respiratory disorders.

Purpose of study

The study of the physiology of respiration, the main clinical manifestations, as well as the identification of diagnostic criteria for psychogenic cough and shortness of breath and their relationship with emotional overstrain and stress among different age groups.

Material and methods

Study of the proposed literature, conducting questionnaires among the population of different age groups.

Results and discussion

The respiratory component remains a crucial part of adaptive responses that require rapid increase in oxidative capacity in acute stress situations. Traditionally, chronic cough was believed to be caused by conditions like gastroesophageal reflux disease, asthma, rhinosinusitis, lung congestion, and smoking. However, Song and his colleagues have suggested that these conditions may not be fundamental in the etiology of cough, but may be triggers that will subsequently lead to the development of psychogenic cough.[1] In addition, the accompanying psychological problems can be seen as aggravating factors in some people. Detecting and treating the root cause of cough was previously believed to reduce or eliminate it. The term psychogenic cough was used to describe a cough that had no medical etiology, no medical treatment and had a psychiatric or psychological basis.[2] The diagnosis of chronic cough was psychogenic if the cough was persistent despite medical treatment, had a tinkling or barking nature, was absent during sleep, or was related to mental illness.

Now the term «psychogenic cough» has been replaced by the term «somatic cough syndrome». The diagnosis of somatic cough syndrome (psychogenic cough) cannot be based on the presence or absence of a night cough, barking or hissing nature, anxiety or depression. Diagnosis of somatic cough syndrome (psychogenic cough) is submitted only after extensive evaluation, exclusion of atypical causes of cough and compliance of the patient with the following criteria: presence in the patient of one or more somatic symptoms, that cause anxiety or significant disruption of daily life, as well as obsessive thoughts about the severity of symptoms, a high level of anxiety about symptoms, or excessive time and energy devoted to symptoms.[3]

The mechanisms of psychogenic dyspnea are not completely clear. The modulating areas of the brain are involved in regulating respiration under the influence of various stressors. Lateral parabrachyal nucleus when acting on stressors sends an alarm impulse to the forebrain. The activity of the lateral column of the periaqueductal gray also contributes to the increase in respiration frequency. It is also possible to increase the sensitivity of the important chemoreceptive center - retrotrapezoid nucleus - through cholinergic projections of the peduncolopentine nucleus.

Also, the breathing rhythm is influenced by the limbic system. On the background of hypercapnia and reduction in pH, the amygdala and bed nucleus of stria terminalis is extitated, which leads to the formation of fear/ rage, increased breathing frequency. Paraventricular hypothalamus stimulates the reflex reduction of breathing rate, increase of arterial pressure, increase activity of diaphragm nucleus.[7,8]

It is important to note the role of the cerebral cortex in influencing the respiratory rhythm, since organic bilateral damage to the hemisphere leads to the development of pathological Cheyne-Stokes respiration.[7] The premotorial, caudo-medial frontal, occipito-frontal and motor zones, insula, upper temporal gyrus make the greatest contribution to the regulation of the breath.[9]

Thus, in the context of the events described above, hyperventilation, sleep disturbance and cardiac activity develop, often accompanied by psychogenic coughing attacks and shortness of breath. Complaints of patients with psychogenic respiratory disorders are not specific: dryness, burning, tickling, tightness, squeezing, feeling of pain, numbness and constant need to cough. In the advanced form of the disease, bleeding occurs.

Dry persistent cough irritates the mucosa of the larynx and throat (up to the development of laryngosphasm in some cases), and is generally not cured by usual therapy. This cough is often combined with a sudden onset and disappearance of the voice, spastic disphonia. At the beginning of a conversation with the doctor, patients say snide phrases, sometimes transitioning into incomprehensible whispers, and relax after several sentences or even after each word.

The onset of psychogenic shortness of breath and cough often accompany heartbeats which increase with agitation and walking, and cardialgia which lead to bouts of carminic pain. Even in the absence of cardialgia patients always «feel» their heart and usually are sure they have a serious pathological process in myocardium and cardiac insufficiency.[4,5]

Patients relate complaints to a certain time of day. They may occur either in the morning, after awakening, or at night, when «hard» to sleep, or at night when thoughts of anxiety-depressive content are affixed. Psychogenic respiratory disturbances are manifested primarily by forced surface breathing followed by its uncaused increase and deepening. Frequent short movements are accompanied by arbitrary slow breaths and the consequent unnecessary breathing delay. The increase in amplitude and frequency of respiration with their subsequent decrease, and the appearance of short pauses between these waves resemble the unstable Cheyne-Stokes breathing.[5]

Irregular respiratory rhythm, pronounced functional dysrhythmia of breathing occur most often episodic, but may persist for several days, weeks and months. Physical exertion is accompanied by higher than normal, breathing rate. Tachypnoe and increased minute breathing volume do not contribute to increase oxygen consumption and do not relieve the feeling of insufficiency of breath. The reserve breathing capacity is not fully utilized: the life capacity of most patients is below normal or at its lower limit.

The above mentioned, physical manifestations of psychogenic shortness of breath cause anxiety in patients and become subject to hypochondriac fixation. Psychogenic respiratory disorders are usually detected against the background of depressed mood, fear and anxiety, which subsequently causes persistent artificial hyperventilation, becoming obsessive, or, conversely, chronic hypoventilation as a result of the restriction of normal locomotion.

Hyperventilation syndrome is associated or interspersed with complaints of weakness and general malaise, severe sweating and dryness in the mouth, head-spinning and nausea, sagging and coldness of limbs, heart rate increase. In this state, with thoughts of anxious-depressive content, unpleasant sensations of compression and pressure in the chest, heat or chills throughout the body, dizziness and photons in the eyes appear or are sharply increased. Usually no cyanosis, normal saturnism, only slight tachycardia or absence.

Hyperventilation syndrome is usually caused by acute emotional stress which subsequently leads to the stimulation of the respiratory center and excessive hyperventilation. It in turn leads to excessive leaching of CO2 from the blood, causing acute respiratory alkalosis. Calcium is transferred from the blood to the cells which leads to the development of acute hypocalcemia and convulsive reduction of the ischial muscles and fingers.[10] After the psychogenic cough and shortness of breath patients suffer from weakness, irritability, drowsiness, possible painful hiccups, unbearable fever.

As a treatment of psychogenic respiratory disorders, non-medicated therapy is used: hypnosis, suggestion therapy, sedation and counseling by a psychologist or psychiatrist. However, before a correct diagnosis is made, many patients undergo long and unsuccessful examinations and trial treatments in an attempt to diagnose and control symptoms.[1] The long time needed to make an accurate diagnosis can cause psychological stress in some patients. In addition, numerous physical, social and emotional «side effects» of psychogenic cough and shortness of breath such as avoidance of daily activities, difficulties in interpersonal relationships, stress incontinence and avoidance of conversation can affect psychological health thereby aggravating symptoms.

In the course of a further study, a questionnaire was conducted among the population of different age groups (40.4% - population over 25 years old, 13.8% over 45) which showed:

I. Among the interviewees work/ study is accompanied by emotional stress, stress: always 12.8%, often 55.3% and sometimes 29.8%.

II. 48.9% of the respondents have chronic diseases.

III. During emotional overstrain, stress, panic feeling of lack of air, cough, chest tightness occurs: always - 4.3%, often - 14.9%, sometimes - 39.4%, never - 41.5%.

IV. In peace 58.5% don't have a feeling of lack of air, lack of appetite, numbness and constant need to cough.

V. Symptoms are self-contained by 53.2% of the surveyed interviewees, while only 4.3% use drugs.

VI. The symptoms (feeling of lack of air, coughing, itching, cough, shortness of breath) occur: in the morning after sleep (5.3%); in the evening before bed (2.1%); at night (4.3%) and not related to time (43.6%).

VII. In 28.9% of the people interviewed, the cough is accompanied by a sudden onset and disappearance of the voice.

VIII. 44.7% of the above symptoms (feeling of lack of air, coughing, itching, cough, shortness of breath) are accompanied by a heartbeat that increases with physical activity and pain in the heart area.

IX. Among those surveyed, 11.1% of the population is suffering from cyanosis

Conclusion

In today's society, emotional overstrain and stress are common which leads to the onset of psychogenic cough and shortness of breath which further leads to anxiety and hypochondriac fixation in patients. The so-called closed loop occurs in which symptoms of psychogenic respiratory disorders (feeling of lack of air, dryness, tightness, cough, shortness of breath) cause anxiety in the patient, leading to hyperventilation or hypoventilating, which subsequently become obsessive.

According to the questionnaire and the literature, the following diagnostic criteria of respiratory disorders can be identified:

I. Expressed anxiety and obsessive thoughts about the seriousness of symptoms, leading to disruption of life;

II. The association of symptoms with stress, the emotional traumatic event;

III. Other somatic symptoms such as sweating, coughing in the mouth, dizziness, nausea, heart palpitations;

IV. Normal results of diagnostic tests;

V. No symptoms at night;

VI. Symptoms are controlled by non-medicated treatment.

However, for an accurate diagnosis it is necessary to perform anamnesis, examination and a series of laboratory and instrumental

Citation: Bon LI, Sedinevskaya SA, Pushkin MA. Clinical study of the impact of psychogenic shortness of breath and cough on human life. *MOJ Biol Med.* 2025;10(1):10–12. DOI: 10.15406/mojbm.2025.10.00233

tests to confirm or rule out the patient's psychogenic cough and shortness of breath.

Acknowledgements

None.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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