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IRRIGATIONAL DYSPNEA AND STEROID USE

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ABSTRACT

Background: Dyspnea, or shortness of breath, is a prevalent and distressing symptom arising from a variety of underlying etiologies, including respiratory, cardiac, neuromuscular, psychogenic, and systemic illnesses. Understanding the prevalence, associated factors, and outcomes of dyspnea, particularly related to irrational steroid use, is critical for improving patient management and outcomes. **Objective**: This study aims to investigate the prevalence of dyspnea among patients, identify associated factors, and assess outcomes related to steroid usage and awareness. **Methods**: A cross-sectional observational study was conducted at Al Hussainey Hospital, involving 93 participants who were interviewed using a structured questionnaire. Data on demographic characteristics, health and smoking status, respiratory complaints, and steroid usage were collected. Statistical analysis was performed using SPSS version 25.0, employing descriptive and inferential statistics to evaluate associations between variables. **Results**: The sample comprised 52.7% females and 47.3% males, with a mean age of 8.5 years. A significant portion of participants reported low monthly family incomes and limited education. Chronic diseases, particularly asthma (20.4%) and chronic bronchitis (11.8%), were common, with a notable proportion (38.7%) experiencing dyspnea during public gatherings. Environmental triggers such as dust and perfumes were identified. Steroid use was prevalent, with 33.3% using steroids thrice daily, yet 86% were unaware of associated risks. Age differences were significant, with younger participants more affected by chest infections and older participants by asthma ($p < 0.001$). **Conclusion**: The study underscores the impact of socio-economic factors on respiratory health, the high prevalence of respiratory complaints, and the widespread but poorly informed use of steroids. There is a critical need for targeted educational interventions to improve steroid usage awareness and tailored management strategies for different age groups to address dyspnea effectively.

KEYWORDS: Dyspnea, Steroid Usage, Respiratory Health, Socio-economic Factors, Public Health, Asthma, Chronic Bronchitis.

INTRODUCTION

Dyspnea, commonly referred to as shortness of breath, is the subjective sensation of uncomfortable breathing comprised of various sensations of varying intensity. It is a common symptom impacting millions of people and maybe the primary manifestation respiratory, cardiac, neuromuscular, psychogenic, systemic illness, or a combination of these. Dyspnea can be either acute or chronic with acute occurring over hours to days and chronic occurring for more than 4 to 8 weeks.[1,2]

Dyspnea is a symptom of the disease, rather than a disease itself. As such, its etiology can be designated as arising from four primary categories: respiratory, cardiac, neuromuscular, psychogenic, systemic illness, or a combination of these.

Respiratory causes may include asthma, acute exacerbation of or chronic congestive obstructive pulmonary disorder (COPD), pneumonia, pulmonary Embolism, lung malignancy, pneumothorax, or aspiration.

Cardiovascular causes may include congestive heart failure, pulmonary edema, acute coronary syndrome, pericardial tamponade, valvular heart defect, pulmonary hypertension, cardiac arrhythmia, or intracardiac shunting. Neuromuscular causes may include chest trauma with fracture or flail chest, massive obesity, kyphoscoliosis, central nervous system (CNS) or spinal cord dysfunction, phrenic nerve paralysis, myopathy, and neuropathy. Psychogenic causes may include hyperventilation syndrome, psychogenic dyspnea, vocal

cord dysfunction syndrome, and foreign body aspiration. Other systemic illnesses may include anemia, acute renal failure, metabolic acidosis, thyrotoxicosis, cirrhosis of the liver, anaphylaxis, sepsis, angioedema, and epiglottitis.[3-5]

Every evaluation should begin with a rapid assessment of the ABC status of the patient. Once these are determined to be stable, and no life-threatening status present, a complete history, and physical exam can be collected. Vital signs should be assessed for heart rate, respiratory rate, body temperature, body mass index (BMI), and oxygen saturation. Fever may indicate an infectious etiology. A chest x-ray is the first diagnostic test that should be utilized in evaluating dyspnea. If abnormal the disease process is likely cardiac or a primary pulmonary process. An echocardiogram is needed to evaluate cardiac function and valvular function. Additionally, an electrocardiogram should be obtained to evaluate for myocardial infarction or right-sided heart pattern strain. Elevated pro-BNP levels can further a congestive heart disease diagnosis.

If the chest x-ray is normal, then spirometry is needed to determine lung function. Abnormal spirometry can indicate either an obstructive pathology such as asthma, COPD, or physical airway obstruction or restrictive disease processes such as interstitial fibrosis. Spirometry can also indicate the presence of respiratory muscle weakness from muscular or neurological abnormalities. Normal spirometry indicates a need to evaluate for hypoxia as a source of dyspnea. Arterial blood gas testing is used for this purpose as well as to calculate the A-a gradient and assess for an acidotic state. If hypoxic at PaO2 less than 70 mm Hg a V/Q scan is needed. Detection of a mismatch indicates pulmonary embolism. If a pulmonary embolism is clinically suspected, d- Dimer testing may be pursued, but this test has a low specificity and a high sensitivity and should be only used in high clinical suspicion of deep vein thrombosis or pulmonary embolism.

Spiral CT of the chest is an alternative to V/Q scanning. A normal scan necessitates cardiac catheterization to determine pulmonary hypertension, intracardiac shunting, or coronary artery disease. A normal cardiac catheterization diagnosis idiopathic dyspnea. If hypoxia is not present with a PaO2 greater than 70 mm Hg, correlation with oxygen saturation is needed.

Abnormal oxygen saturation indicates possible carbon monoxide poisoning methemoglobinemia or an abnormal hemoglobin molecule. Normal oxygen saturation requires a complete blood count (CBC) to evaluate hemoglobin content and hematocrit values. The white blood count also assesses for an immune response to possible infection. Hematocrit less than 35% is anemia. Hematocrit greater than 35% necessitates evaluation with exercise pulmonary function testing. Abnormal pulmonary function testing indicates a fixed cardiac output or exercise - induced asthma. Normal exercise pulmonary function testing indicates deconditioning, psychogenic dyspnea, or a hypermetabolic state.

If an infectious etiology is suspected, culturing of the organism from the infected site should be attempted. In pneumonia, this is via sputum culture or bronchoalveolar lavage. In systemic infections or sepsis, this is via serial blood culture. Culture allows for appropriate targeted antibiotic therapy.

Testing should be targeted toward clinical suspicion, history, and physical exam to avoid over-testing and minimize cost to the patient.[6-9]

Acute dyspnea is most likely caused by acute myocardial ischemia, heart failure, cardiac tamponade, bronchospasm, pulmonary embolism, pneumothorax, pulmonary infection in the form of bronchitis or pneumonia, or upper airway obstruction by aspiration or anaphylaxis. Chronic dyspnea is most likely caused by asthma, chronic obstructive pulmonary disease, Interstitial lung disease, myocardial dysfunction, obesity, or deconditioning.[10]

PATIENTS AND METHODS

Study Design: This research employed a cross-sectional observational design to examine the prevalence, associated factors, and outcomes of irritational dyspnea among patients. The study utilized a survey-based approach to collect data on various health and lifestyle factors that might influence respiratory health.

Setting: The study was conducted at the Al Hussainey Hospital. Data collection was performed through patient interviews conducted by healthcare professionals in the clinic.

Participants: A total of 93 participants were included in this study. Participants were recruited from patients attending Al Hussainey Hospital. Inclusion criteria included patients who were willing to participate and able to provide informed consent.

Data Collection: Data were collected using a structured questionnaire filled out during patient interviews. The questionnaire was designed to gather information on demographic characteristics, health and smoking status, respiratory complaints, steroid usage, and awareness of steroid risks.

Ethical Considerations: All participants provided informed consent before taking part in the study. The anonymity and confidentiality of participants were maintained throughout the study. Data were securely stored and only accessible to the research team.

Statistical Analysis: Data were analyzed using SPSS (Statistical Package for the Social Sciences) version 25.0.

Descriptive statistics, such as frequencies and percentages, were used to summarize demographic characteristics, health status, smoking habits, respiratory complaints, and steroid usage. Inferential statistics, including Fisher's Exact test and ANOVA, were employed to assess associations between variables and to determine the significance of differences observed among groups. The significance level was set at $p < 0.05$.

RESULTS

Demographic Distribution

The demographic distribution of the participants is presented in Table 1. Out of the 93 participants, 49 (52.7%) were female and 44 (47.3%) were male. The majority of participants were single (92, 98.9%), with only 1 participant (1.1%) being married. In terms of educational level, 6 participants (6.5%) had primary education, 4 (4.3%) had secondary education, 23 (24.7%) had university education, and 60 (64.5%) were uneducated. Regarding monthly family income, 20 participants (21.5%) reported an income between 250,000 to 1 million IQD, 52 (55.9%) had less than 250,000 IQD, and 21 (22.6%) had more than 1 million IQD. The mean age of the participants was 8.513 years (SD = 8.4233).

Table 1: Demographic Distribution.

Category	Frequency	Percent
Gender		
Female	49	52.7
Male	44	47.3
Marital Status		
Single	92	98.9
Married	1	1.1
Educational Level		
Primary	6	6.5
Secondary	4	4.3
University	23	24.7
Uneducated	60	64.5
Monthly Family Income		
250,000 - 1 million IQD	20	21.5
Less than 250,000 IQD	52	55.9
More than 1 million IQD	21	22.6
Total	93	100
Age Mean ± Sd. (Years)	**8.513 ± 8.4233**	

Health and Smoking Status: Table 2 details the health and smoking status of the participants. A significant majority of participants (53, 57%) reported having no chronic diseases. The most common chronic disease was asthma, reported by 19 participants (20.4%), and followed by chronic bronchitis (11, 11.8%). Only 4 participants (4.3%) reported smoking, while the vast majority (83, 89.2%) did not smoke. Additionally, 5 participants (5.4%) were non-smokers but were frequently around smokers, and 1 participant (1.1%) was a former smoker.

Table 2: Health and Smoking Status.

Category	Frequency	Percent
Do you have any of the following chronic diseases?		
Hypertension	2	2.2
Chronic bronchitis	11	11.8
Asthma	19	20.4
Gastrointestinal and liver diseases	1	1.1
Neurological or psychological diseases	1	1.1
Kidney diseases	3	3.2
None	53	57
Diabetes	3	3.2
Total	93	100
Are you a smoker?		
I smoke	4	4.3
I do not smoke	83	89.2
I do not smoke but I am around smokers	5	5.4
Former smoker	1	1.1
Total	93	100

Respiratory Complaints Distribution: Table 3 summarizes the distribution of respiratory complaints among the participants. Out of 93 participants, 36 (38.7%) reported experiencing shortness of breath during public gatherings, while 57 (61.3%) did not. Among those who experienced respiratory issues, 37 participants (39.8%) associated their condition with smelling certain perfumes, 26 (28%) with other factors, and 13 (14%) with dust. Notably, 47 participants (50.5%) had experienced similar conditions before the age of five, and 30 (32.3%) reported that their parents experienced the same symptoms at their age.

Table 3: Respiratory Complaints Distribution.

Question	Frequency	Percent
Do you experience shortness of breath during public gatherings?		
No	57	61.3
Yes	36	38.7
Total	93	100
Is your condition associated with any of the following?		
Dust	13	14
When smelling certain perfumes	37	39.8
Other factors	26	28
I do not suffer from shortness of breath	17	18.3
Total	93	100
Did you experience the same condition before the age of five?		
No	46	49.5
Yes	47	50.5
Total	93	100
Did your parents experience the same symptoms at your age?		
No	63	67.7
Yes	30	32.3
Total	93	100

51.6% of patients with dyspnea in our sample diagnosed with chest infection, as shown in Figure 1.

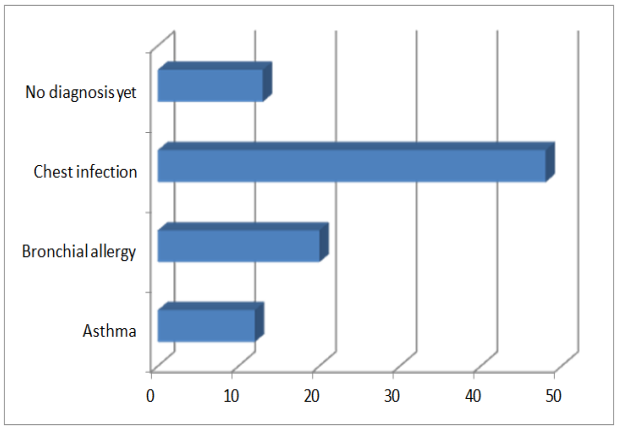

Figure 1: Diagnosis Distribution.

Steroid Usage and Awareness: Table 4 outlines steroid usage and awareness among the participants. Steroid usage frequency varied, with 31 participants (33.3%) using steroids three times a day, 20 (21.5%) twice a day, 18 (19.4%) only when needed, and 6 (6.5%) once a day. Notably, 18 participants (19.4%) did not use steroids at all. Furthermore, a significant majority (80 participants, 86%) were not aware of the risks associated with irrational steroid use, while only 13 (14%) were aware.

Table 4: Steroid Usage and Awareness.

Question	Frequency	Percent
How often do you use steroids?		
3 times a day	31	33.3
Only when needed	18	19.4
I do not use	18	19.4
Once a day	6	6.5

Twice a day	20	21.5
Total	93	100
Are you aware of the risks associated with irrational use of steroids?		
No	80	86
Yes	13	14
Total	93	100

Table 5 presents the mean age differences among participants with different diagnoses. Participants with asthma had a mean age of 14.333 years (SD = 7.3154), those with bronchial allergy had a mean age of 10.015 years (SD = 9.0143), participants diagnosed with chest infection had a mean age of 5.263 years (SD= 6963), and those with no diagnosis had a mean age of 12.831 years (SD = 9.5152). The ANOVA test indicated a significant difference in age among these diagnoses ($p < 0.001$).

Table 5: Age Difference among Different Diagnoses.

Diagnosis	**Age (Mean ± SD)**
Asthma	14.333 ± 7.3154
Bronchial allergy	10.015 ± 9.0143
Chest infection	5.263 ± 6.6963
No diagnosis	12.831 ± 9.5152
ANOVA *p* value	**0.000**

DISCUSSION

The demographic distribution of the participants in this study revealed some noteworthy patterns. Females represented the majority, comprising 52.7% of the sample, which aligns with global trends indicating a higher prevalence of respiratory diseases among women.[11] This could be attributed to biological factors, lifestyle differences, or healthcare-seeking behavior. However, it's important to note that the sample size of this study might not be representative of the general population, thus caution should be exercised in generalizing these findings.

Regarding marital status and educational level, the overwhelming majority of participants were single and had limited education. This socio-demographic profile might impact health outcomes, as lower education levels are often associated with poorer health literacy and limited access to healthcare resources. Previous studies have shown correlations between educational attainment and respiratory health,[12] emphasizing the need for targeted interventions in vulnerable populations to improve health outcomes.

Income disparities were evident in the study, with a substantial portion of participants reporting low monthly family incomes. Financial constraints can significantly impact healthcare utilization, medication adherence, and exposure to environmental pollutants, all of which are pertinent factors in respiratory health. Addressing these disparities requires comprehensive public health policies aimed at improving socio-economic conditions and ensuring equitable access to healthcare services.

Respiratory complaints were common among the participants, with a considerable proportion reporting shortness of breath during public gatherings (38.7%) which is higher than prevalence of dyspnea in general adult populations which is 10% as reported by study conducted by Müller et. al.[13] Environmental factors such as dust and certain perfumes were identified as triggers, highlighting the importance of addressing indoor and outdoor air quality to mitigate respiratory symptoms. The early onset of respiratory issues, as reported by nearly half of the participants before the age of five, underscores the need for early intervention and prevention strategies targeting childhood respiratory health.

The diagnosis distribution among participants with dyspnea revealed a notable association with chest infection, indicating the potential infectious etiology of respiratory symptoms. However, further investigations are warranted to elucidate the specific pathogens involved and inform targeted treatment approaches.

Steroid usage was prevalent among the participants, with varying frequencies of administration reported. Despite the widespread use of steroids, a concerning proportion of participants were unaware of the associated risks (86%), while in another study conducted by Alhusaini et. al. 41.1 % were aware about the side effects and usage of steroids.[14] Highlighting the importance of patient education and healthcare provider guidance in promoting rational medication use. The findings emphasize the need for comprehensive asthma management programs focusing on proper medication usage, inhaler techniques, and awareness of potential side effects.

The age differences among participants with different diagnoses underscore the heterogeneous nature of respiratory conditions across different age groups. Asthma was more prevalent among older participants, whereas chest infection was more common in younger individuals. These age-related differences highlight the dynamic nature of respiratory diseases and the importance of tailored management strategies based on

age, disease severity, and individual characteristics.

CONCLUSION AND RECOMMENDATIONS

CONCLUSIONS

1. **Demographic and Socio-economic Influences**: The study highlights the significant impact of socio-economic factors, such as low income and limited education, on respiratory health outcomes. The high prevalence of respiratory complaints among participants underscores the need for targeted interventions in vulnerable populations.
2. **Awareness and Steroid Usage**: Despite the common use of steroids among participants, there is a notable lack of awareness regarding the risks associated with their irrational use. These points to a critical gap in patient education and the need for improved healthcare guidance.
3. **Age-Related Respiratory Conditions**: The distribution of respiratory diagnoses across different age groups indicates that younger participants are more susceptible to chest infections, while older participants more commonly suffer from asthma. This finding suggests the necessity of age- specific respiratory health management strategies.

RECOMMENDATIONS

1. **Enhance Health Education**: Implement comprehensive health education programs aimed at increasing awareness about the proper use of medications, particularly steroids, and the risks associated with their misuse. These programs should target both patients and healthcare providers to ensure consistent and accurate information dissemination.
2. **Improve Access to Healthcare**: Develop policies to improve access to healthcare services for low-ncome and less-educated populations. This could include providing affordable healthcare, expanding community health programs, and increasing funding for preventive health services.
3. **Age-Specific Interventions**: Design and implement age-specific interventions for managing respiratory conditions. For younger populations, focus on infection prevention and early treatment of respiratory infections. For older populations, enhance asthma management programs, including routine monitoring and personalized treatment plans.

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