

# ANEMIA AND CHRONIC OBSTRUCTIVE PULMONARY DISEASES

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## ABSTRACT

**Objective:** To determine the frequency of Anemia in patients with chronic obstructive pulmonary disease (COPD).

**Material and Methods:** This Cross-sectional study was conducted in Pulmonology Ward of Khalifa Gul Nawaz Teaching Hospital, Bannu from September 2012 to May 2013. All male and female patients of age 40 years and above were included having COPD according to the criteria of Pakistan Chest Society. Sample size was 241 and sampling technique was of non probability convenient type. Hemoglobin (Hb) level of every patient was assessed for anemia. Data was analyzed in SPSS version 16 for descriptive statistics.

**Results:** A total of 241 COPD patients were included in this study. Female patients exceeded male, with 129(53.5%) females. Mean age was 63 years  $\pm$  11.38 SD. All the patients had variable duration of COPD. Seventy patients had COPD for  $\leq$ 5 years, 128 patients for 6-20 years, 43 patients had COPD for 21 years and above Anemia was confirmed in 180 (74.7%) patients. Among these cases, 100 (55.55%) were female and the remaining 80 (44.44%) were male.

**Conclusion:** COPD patients had a high prevalence of anemia, and failure to address this may lead to morbidity and mortality.

**Key Words:** COPD, Anemia, Hemoglobin.

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## INTRODUCTION

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) has defined COPD as “a common and preventable disease characterized by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response of the airways and the lung to noxious particles or gases. Exacerbations and co-morbidities contribute to the overall severity in individual patients”. The American Thoracic Society (ATS) and the European Respiratory Society

(ERS) have largely adopted the GOLD definition in their latest guidelines stressing the preventable and treatable nature of the syndrome, and incomplete reversibility of airflow limitations, as well as the importance of its co-morbidities and systemic consequences. The criteria used for defining airflow limitation and reversibility is “a forced expiratory volume in 1 second (FEV1) / forced vital capacity (FVC) ratio of  $<70\%$ .”<sup>1</sup>

COPD contributes to increased disease load and high mortality worldwide<sup>2</sup>. The leading cause of morbidity in adults, especially the elderly is due to COPD. Worldwide, COPD is the 3<sup>rd</sup> evident cause of death<sup>3</sup> and is predicted to drop to the fourth most common cause of death by 2030<sup>4</sup>. In 2006, a meta analyses of studies of the general population published between 1990-2004 around the world estimated the prevalence of COPD to be 7.6%<sup>5</sup>. Anemia is a common co-morbidity in COPD<sup>2</sup>. Anemia in general, is defined as a haemoglobin level

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<12 g/dL in non-pregnant women and <13 g/dL in men<sup>6</sup>. The European Best Practice Guidelines suggest anemia in men if the haemoglobin level is <12 g/dL (if age >70 years) or <13.5 g/dL (if age ≤70) and in women if hemoglobin is <11.5 g/dL (age independent)<sup>7</sup>.

Prevalence of anemia in COPD patients differs widely. This variability is due to age, haemoglobin reference value and might be relative anemia<sup>8</sup>. Anemia is a frequent co-morbid disease in COPD having prevalence rate of 5% to 30%<sup>9</sup>. The reason for this study was to determine the frequency of anemia in COPD patients. The results of this study will show objective evidence of anemia that will be helpful in formulating prevention and its resulting complication.

### MATERIAL AND METHODS

This was a cross sectional descriptive study, conducted in the Medical Ward of Khalifa Gul Nawaz Teaching Hospital, Bannu, KPK Pakistan from September 2012 to May 2013. Simple Random Sampling was done. All admitted male and female COPD patients in Pulmonology Unit according to the criteria of European Respiratory Monograph were included in this study, while those patients having Asthma (having peak expiratory flow variability of >20% or an increase in FEV1 of >15% (and >200ml) 15 mint after inhalation of standard dose of beta-2 agonist as Asthma mimics COPD were excluded.

After recommendation from ethical committee, patients satisfying the diagnostic criteria for COPD as per European Respiratory Society (FEV1/FVC <70%), informed consent was taken from the patients. Demographic information, duration of COPD, symptoms of COPD and anemia were observed. The diagnosis of anemia was confirmed by Hb level inside the Pathology Lab of Khalifa Gul Nawaz Teaching Hospital, Bannu. All data was put in the proforma. Data was statistically analyzed through SPSS version 16.

### RESULTS

A total of 241 COPD patients were included in this study. Male patients were 112 (46.5%) and 129(53.5%) were female. Mean age was 63 years ± 11.38 SD. All the patients had a variable duration of COPD, as shown in figure 1. Anemia was confirmed in 180 (74.7%) patients. Among these confirmed case 100 (55.55%) were female and the remaining 80 (44.44%) were male. From cross tabulation we get maximum anemic patient in age group 61-70 years among male, and age group 51-60 years in female as shown in Table 1.

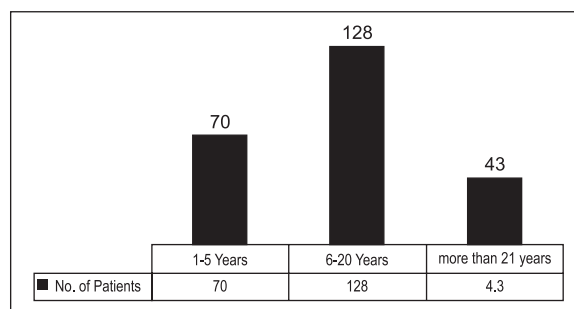


Fig 1: Duration of chronic obstructive pulmonary disease (COPD)

Table 1: Relationship of age and sex with anemia

Gender	Age in years	Anemia		Total
		Yes	No	
Male	41-50	12	7	19
	51-60	18	3	21
	61-70	30	11	41
	71-80	15	10	25
	81-90	5	1	6
		80	32	112
Female	41-50	33	6	39
	51-60	34	10	44
	61-70	23	7	30
	71-80	10	5	15
	81-90	0	1	1
		100	29	129
	Total	180	61	241

### DISCUSSION

Chronic obstructive pulmonary disease (COPD) is one of the most prevalent chronic diseases, with an increasing rate in morbidity and mortality. In recent years, there has been a greater awareness about the clinical importance of systemic effects and other chronic conditions associated with COPD, as these significantly impact on the course of disease. The most studied extrapulmonary manifestations in COPD include the presence of concomitant cardiovascular disease, skeletal muscle wasting, osteoporosis and lung cancer. Anemia is a recognized independent marker of mortality in several chronic diseases. In our study 74% patient had anemia with COPD. Recent studies<sup>16,17,18</sup> have shown that anemia in patient with COPD may be more frequent than expected, with a prevalence ranging from 5% to 33%. Some evidence suggests that systemic inflammation may play an important pathogenic role, but anemia in COPD is prob-

ably multifactorial and may be caused by other factors, such as concealed chronic renal failure, decreased androgenic levels, iron depletion, angiotensin-converting enzyme inhibitor treatment and exacerbations. Low levels of haemoglobin and haematocrit in COPD patients have been associated with poor clinical and functional outcomes as well as with mortality and increased healthcare costs. Despite the potential clinical benefit of successfully treating anemia in these patients, evidence supporting the importance of its correction on the prognosis of COPD is uncertain.

Prevalence of anemia in COPD has been reported to vary from 7.5 to 33%<sup>19</sup>. While in another study it was 13% of 101 COPD patients and they pathogenetically related it to the presence of inflammation. Anemia was normocytic and normochromic in nature. Halpern et al by using the US Medicare claims database, reported anemia in 21% of 132,424 patients with a COPD diagnosis. The most recent hospital-based cross-sectional study reported anemia in 18% of the patients in a retrospective data analysis of 2404 COPD patients from USA reported a very high frequency of anemia, of 33%.<sup>11</sup> Therefore, anemia is definitely a common entity in COPD patients, unlike the traditional view of polycythemia, that is given more emphasis in almost all standard textbooks. The frequency of anemia in COPD patients is variable in literature, reflecting various methods of studies, outpatient versus hospitalized patients, stable versus patients in acute exacerbation of COPD, local prevalence of anemia.

### CONCLUSION

Patients with COPD had a high prevalence of anemia, and failure to address this may lead to morbidity and mortality.

### RECOMMENDATIONS

Educational campaign should be encouraged to create mass awareness regarding its proper follow up, proper medication, work up for the complication and good nutrition advices.

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### **AUTHOR'S CONTRIBUTION**

Following authors have made substantial contributions to the manuscript as under:

**Tahir M:** Concept and design, Acquisition of Data.

**Nasib AH:** Critical review, Drafting of Manuscript.

**Hanan A:** Manuscript writing.

**Nasib B:** Data analysis and interpretation.

**Muhammad S:** Review, Drafting of Manuscript.

**Raza SS:** Review, Drafting of Manuscript.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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