ORIGINAL ARTICLE

Study on Presence of Anemia in COPD Patients and its Correlation with Disease Severity in Tertiary Care Hospital, Bangalore, India

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ABSTRACT

Aim: To find out presence of anemia in COPD patients and its correlation with disease severity in tertiary care hospital, Bangalore, India

Methodology: It was a prospective observational study conducted in intensive care unit (ICU), medical wards, surgical wards and high intensive care unit (HICU) of Bangalore Baptist hospital, conducted for a period of 6 months from October 2016 march 2017. All patients diagnosed with Asthma and COPD in medical, surgery, and HICU and ICU wards. The patient data collection was used to collect all the details like inpatient number, age, sex, social history, past history, laboratory data, diagnosis, therapeutic management. The second step was finding of anemic patients with COPD and Asthma or both, and analyzing of important laboratory data to find the effect of anemia on disease and therapeutic managements. The drug interaction in prescription was collected and then compare with guidelines. When the analysis of prescription was completed then all data entered to the appropriate software and the results were gained.

Conclusion: The result of this study showed male patients were listed more (66%) than female (34%).the majority member of patients were in 50-79 years' age group, also we found out that the percentage of anemic female (35.2%) is more than anemic male (30. 3%).In this study we found that out of 100 patient's anemia was confirmed in 32 patients. The clinical parameters as cough, expectoration, breathlessness, number of hospitalization and etc. were listed more in anemic patients compared to non-anemic. Also we know that anemia is being more prevalent in most of the sufferers of COPD. The result of this study provide evidence that variable of inflammatory biomarkers, including blood eosinophil and neutrophil were more in COPD-ASTHMA patients, that also can be used to support the diagnosis of ASTHMA-COPD.

Keywords: Anemia, disease severity, COPD and ASTHMA patients

INTRODUCTION

COPD is gradually dynamic issue portrayed via wind stream deterrent. The Global Initiative for Obstructive Lung Disease (GOLD) characterizes the condition as "A preventable and treatable ailment with some critical extra aspiratory impacts that may add to the seriousness in singular patients. Its aspiratory segment is described via wind stream impediment that isn't completely reversible[1].

A COPD intensification is the most widely recognized condition that requires medical clinic affirmation with the hospitalization contributing significantly to the related financial effect. Other studies have also shown that a significant proportion of health care resource consumption in the treatment of COPD results from hospitalizations due to exacerbations and less than 20% results from outpatient care (excluding medication) and diagnostic tests. Therefore, prevention of COPD exacerbations is considered the most important target to reduce costs[4].

In danger patients are remembered for the investigation in the event that they were 40 years old, current or ex-smokers (10 pack years, 50 channels/year, or 50 stogies/year), as well as presented to biomass smoke (wood or coal for cooking and warming; presentation 100 hours/year)[3].

Fundamental irritation in constant obstructive pneumonic ailment may likewise start or decline comorbid ailments. Iron deficiency is one significant comorbidity. The low degree of hemoglobin is unequivocally and freely connected with expanded utilitarian dyspnea and diminished exercise limit, and is along these lines a significant supporter of useful limit just as a low quality of life[5].

A database study directed in COPD patients has demonstrated that a low hematocrit is a solid indicator of endurance in this populace, before weight record, and is related with more hospitalizations and a more drawn out total term of hospitalization. COPD patients with low hemoglobin levels have a less fortunate visualization than COPD patients with typical hemoglobin levels[6].

Iron deficiency is a notable co bleakness of COPD with a pervasiveness extending from 12.3 to 23%. Past contemplates additionally demonstrated that the pervasiveness is a lot higher during intensifications. Paleness in COPD is legitimately connected with unfavorable clinical results, including passing. Hemoglobin levels associated with dyspnea scores, exercise limit, and a few incendiary markers in COPD. Sickliness has additionally been appeared as an autonomous indicator of intermittent hospitalizations and endurance in COPD patients with constant respiratory disappointment[2].

Incessant obstructive aspiratory ailment (COPD) is related with significant extra pneumonic appearances; including weight reduction, skeletal muscle brokenness, cardio vascular ailment, sorrow, osteoporosis, decreased practice resistance, and unforeseen weakness status. Co dismalness is an ailment procedure which existing together with COPD and is likely because of basic hazard factors. Be that as it may, little is known concerning the predominance of co bleak frailty and its effect on personal satisfaction, human services usage, and mortality in patients with COPD[7].

Numerous interminable ailments have been appeared to influence hematopoiesis, bringing about shortening of red platelet (RBC) life expectancy and sequestration of iron in macrophages, and prompting purported pallor of constant infection (ACD). Hypothetically, ceaseless obstructive aspiratory illness (COPD) is another Candidate prone to be related with ACD, when considered in connection to Already-known fundamental impacts of the infection[8].

World Health Organization's (WHO) meaning of frailty depends on a hemoglobin level of under 13 g/dl in men and 12 g/dl in ladies. Iron deficiency in COPD can have different causes. Paleness of incessant infection (ACD) is presumably thought to be the prevalent instrument of frailty identified with interminable fundamental aggravation of COPD. Commonness of pallor in the all-inclusive community increments with age and COPD is a sickness that influences the maturing populace[9].

MATERIALS AND METHODS

The study was conducted in intensive care unit (ICU), medical wards, surgical wards and high intensive care unit (HICU) of Bangalore Baptist hospital for a period of 6 months from October 2016 march 2017. The first step was to design a data collection form. the patient data collection was used to collect all the details like inpatient number, age, sex, social history, past history, laboratory data, diagnosis, therapeutic management. The second step was finding of anemic patients with COPD and Asthma or both, and analyzing of important laboratory data to find the effect of anemia on disease and therapeutic managements.

The diagnosis of COPD was based on pulmonary function test which was done in all patients. According to the Global Initiative for Chronic Obstructive Lung Disease (GOLD) criteria, COPD was defined on the basis of the post bronchodilator forced expiratory volume in 1 s (FEV1)/forced vital capacity (FVC) ratio of <0.70 and reversibility to an inhaled bronchodilator in FEV1 <12% or <200 ml after administration of 200 µg salbutamol (2 puffs) using a pressurized metered-dose inhaler with a spacer[10].

Graph Pad PRISM version 6.01 (Graph Pad software Inc.; La, Jolla, CA, USA). was used for the analysis of data. All demographic and clinical data were expressed as a mean ± standard deviation or percentage. The Chi-square test was used for categorical data and groups were compared by unpaired t-test or one-way analysis of variance. $P < 0.05$ was considered statistically significant. Global Strategy for the Diagnosis, Management and Prevention of COPD, Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2016.

RESULT AND DISCUSION

Out of 100 patients 34 of them are female (2 of them are between 40-49 years old ,9 of them are between 50-59 years , 9 of them are between 60-69 years, 8 of them are between 70-79 and 8 of them are >79 years, all are married ,17 of them is educated and 17 of them are non-educated) and 66 of them are male (2 of them is between 30-39 years , one is between 40-49 years , 14 of them are between 50-59 years , 24 of them are between 60-69 years ,17 of them are between70-79 years and 8of them are >79 years old ,all are married ,55 of them are educated and 11 of them is non-educated). Table 1

Out of 100 patients, 8 of them have medical history of COPD, 4 of them has asthma, 10 of them has asthma-COPD, 47 with COPD-other, 28 with asthma- other and 3 with other medical history. Out of the drugs used in treatment of patients 134 of them were anti-asthmatic /bronchodilator, 133 were antibiotics, 114 of them were anti-inflammatory, 2 of them were adrenal glucocorticoid and one of them was expectorant. Table 2

Out of 100 patient's lab data result shows 56 of them have high level of neutrophil, 41 of them have low level of eosinophil and 46 of them have low level of hemoglobin. Table 3

In our study from 11 COPD-Asthma patients 7 of them had high level of neutrophil and low level of eosinophil, also from 32 Asthmatic patients 20 of them had high level of neutrophil and 16 of them had low level of eosinophil and from 57 COPD patients, high level of neutrophil and low level of eosinophil with 35, 29 respectively. table 4

Our result has been compared with JING GAO *et al,* in their study result the level of neutrophil significantly increased in COPD-Asthma (64%) when compared with asthma and COPD groups. Also low eosinophil level was more in COPD-Asthma group (62%) when compared with the Asthma and COPD groups.

In this study we found that these are some drug-drug interaction between drugs with each other. We found that from total 27 major interactions, interaction between ASPIRIN and CLOPIDOGREL was the most major drug-drug interaction, which caused increased risk of bleeding, so monitoring of blood counts may be warranted.

This result was same with the result which found by STOCKLY'S drug interaction edited by Williams D, [12] in their study also the concomitant use of ASPIRIN and CLOPIDOGREL may increase risk of bleeding so if co-administration is required, monitoring of blood counts may be warranted[11].

We find out the clinical parameters as cough, expectoration, breathlessness, duration of breathlessness >5yrs, no of exacerbation >5time and no of hospital admission >2time, are listed more in anemic patients compared to non-anemic patients. Table 5

Graph 1: Number of Severity of drug interaction

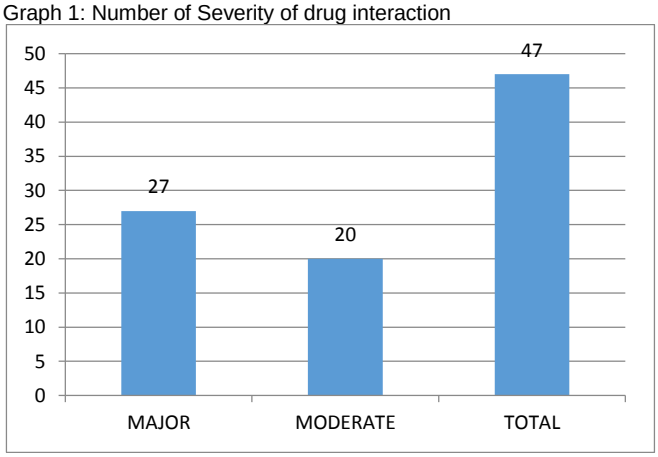

Table 1: Demography details

Age	**Male**				**Female**			
Marital status	**Single**		**Married**		**Single**		**Married**	
Educated	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
20-29yrs	0	0	0	0	0	0	0	0
30-39 yrs	0	0	2	0	0	0	0	0
40-49 yrs	0	0	1	0	0	0	2	0
50-59 yrs	0	0	12	2	0	0	3	6
60-69 yrs	0	0	18	6	0	0	4	5
70-79 yrs	0	0	16	1	0	0	5	3
>79yrs	0	0	6	2	0	0	3	3
Presence of anemia	Yes		No		Yes		No	
	20		46		12		22	

Table 2: Drugs used in patient

Drug class	**Drug name**	**n**
Bronchodilator	Aminophylline/ theophyline/doxophylline/salbutamol-ipratropium bromide inhaler/	134
Antibiotics	Azithromycine/piperacilin- tazobactam/ceftriaxone/amoxicillin/ clarithromycin/ciprofloxacin	133
Anti-Inflammatory	Budesonide inhaler/ hydrocortisone/ montelukast	114
Adrenal Glucocorticoid	Deflazacort	2
Expectorant	Mucolyte	1

Table 3: Lab Data for Asthmatic Patients

Name	**Level (%)**	**Number**
Neutrophils count	Normal (45-75%)	13
	High (>75%)	20
	Low (<45%)	0
Eosinophil count	Normal (1-6%)	19
	High (>6%)	1
	Low (<1%)	13
Hemoglobin	Normal (13.5-17.5%)	17
	High (>18%)	0
	Low (<13%)	16

Table 4: lab data for COPD patient

Name	**Level (%)**	**Number**
Neutrophils Count	Normal (45-75%)	22
	High (>75%)	35
	Low (<45%)	0
Eosinophil Count	Normal (1-6%)	31
	High (>6%)	2
	Low (<1%)	24
Hemoglobin Count	Normal (13.5-17.5%)	26
	High (>18%)	1
	Low (<13%)	29

Table 5: Clinical profile and morbidity associated with the COPD patients under study.

Parameter	**Anemic**	**Non anemic**	**Total number**
Cough	18	52	70
Expectoration	15	47	62
Breathlessness	19	47	66
Duration of Breathlessness	(>5yrs) 3	18	21
	(<5YRS)20	45	65
No. of Exacerbations	(>5TIME) 2	5	7
	(<5TIME) 24	45	69
No of Hospital Admissions	(>2TIME) 12	19	31
	(<2TIME) 18	46	64

CONCLUSION

The result of this study showed male patients is listed more (66%) than female (n=34%).the majority member of patients were in 50-79 years' age group, also we found out that the percentage of anemic female (35.2%) is more than anemic male (30.3%).

In this study we found that out of 100 patient's anemia was confirm in 32 patients. The clinical parameters as cough, expectoration, breathlessness, number of hospitalization and etc. are listed more in anemic patients

compared to non-anemic. Also we know that anemia is being more prevalent in most of the sufferers of COPD.

The result of this study provide evidence that variable of inflammatory biomarkers, including blood eosinophil and neutrophil were more in COPD-ASTHMA patients, that also can be used to support the diagnosis of ASTHMA-COPD.

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