

STUDY OF MICROCYTIC HYPOCHROMIC ANEMIA IN IMPACT RELATION TO LOW RESPIRATORY TRACT INFECTION IN GERIATRIC POPULATION

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INTRODUCTION

Lower Respiratory Tract Infections (LRTI) include infections of the tracheo-broncheal tree (bronchitis) and the lung parenchyma (pneumonia). In these patients anemia is common and is associated with impaired long-term survival and quality of life.^[1-6]

Elderly persons are of particular concern, since they are more likely to develop complications of LRTI as compared with younger patients.

Anemia is often associated with disability, impaired physical performance and lower muscle strength in individuals of age 65 yrs or above.^[7-11]

The most common causes of anemia in the elderly are chronic disease and iron deficiency. Vitamin B₁₂ deficiency, folate deficiency, gastrointestinal bleeding and myelodysplastic syndrome are among other causes of anemia in the elderly.

The anemia of chronic disease encompasses inflammation, infection, tissue injury, and conditions (such as cancer) associated with the release of proinflammatory cytokines. There is inadequate delivery of iron to the marrow despite the presence of normal iron stores. This is due to the effects of inflammatory cytokines and hepcidin, the key regulatory hormone, acting at several levels of erythropoiesis.^[8,12,13]

Normal aging is associated with a decline in food intake and to some extent this is due to low energy demands. In addition, many older individuals tend to consume a monotonous diet that lacks sufficient fresh food, fruits and vegetables, so that intake of micronutrients is inadequate. They are thus prone to develop iron deficiency which may be further precipitated by any acute illness or chronic blood loss.^[5,6,8]

The present study is undertaken to understand the association of microcytic hypochromic anemia with LRTI in elderly population in rural set up.

Hypothesis

Pre existing lower respiratory infection in geriatric population increases the chances of microcytic anemia in these patients.

Research Question

Lower respiratory tract infection as a missing pathogenetic link for lower respiratory tract infection in geriatric.

AIM AND OBJECTIVES

The present study will be carried out with following aims and objectives.

AIM

To study the correlation of microcytic anaemia with lower respiratory tract infection in geriatric population.

OBJECTIVES

1. To diagnose patients of age 65 years or more with microcytic hypochromic anemia using cell counter and peripheral smear examination with pre existing lower respiratory tract infection.
2. To study prevalence of microcytic hypochromic anemia in geriatric patients with lower respiratory tract infections.

MATERIAL AND METHODS

The present study titled “Study of microcytic hypochromic anemia in impact relation to low respiratory tract infection in geriatric population” was carried out with following material and methods.

Preliminary data recording

The patients included in present study who were diagnosed with lower respiratory tract infections were included in the study after recording the preliminary data such as name, age, gender, unit, consultant’s name, date of admission and date of procedure.

The specific details of patients' complain and abdominal examination and related systemic examination findings were entered.

Place of study

The study was carried out in department of Pathology and department of Gastroenterology, Jawaharlal Nehru Medical College, Acharya Vinoba Bhave Rural Hospital, Datta Meghe Institute of Medical Sciences (DU), Sawangi (Meghe), Wardha.

Study design

The present study is a prospective study and the study design is observational cross sectional study.

Sample size and study duration

The present study had a sample size of 50 patients and was carried out in duration of 2 years from the month of August 2016 to July 2018.

Study subject characteristics

Patients with LRTIs (Lower respiratory tract infections) consisted of episodes of pneumonia, acute bronchitis and exacerbations of chronic obstructive pulmonary disease (COPD).

The patients who were recruited to the present study had the following inclusion and exclusion criteria.

▪ Inclusion criteria

1. Patients with age 65years or above.
2. Patients with Hb levels < 12.5 gm/dl diagnosed with LRTI.

▪ Exclusion criteria

1. Patients with age less than 65 years.
2. Patients with LRTI under treatment for LRTI as well as on iron therapy.

Investigations

Hemoglobin, MCV and MCH were estimated in the blood samples using automatic blood cell counters. Peripheral blood smears were stained with Leishman stain.

Procedure

Blood sample were taken from antecubital vein of each patient by a trained phlebotomist. Hemoglobin, MCV and MCH values were estimated in the blood samples by automatic blood cell analyzer.^[14]

The peripheral blood smears were prepared using the following steps:

1. Place the smear on staining rack.
2. Leishman stain is poured to cover the smear completely and allowed to get fixed for 2 minutes.
3. Add buffered distilled water twice the amount of stain and leave for 10 minutes.
4. Wash off the mixture from the slide with buffered distilled water for 1 minute.
5. Pour off the water and dry the smear.

Technical Issues

Informed consent was taken from the patients. The detailed clinical history was taken and general physical examination of patients was done. Interpretation of X Ray investigation was done in view of clinical history and examination.

Statistical Analysis

Numerical variables were reported in terms of mean and standard deviation. Categorical variables were reported in terms of numbers and percentages. Association of each of the categorical variable with response variable were assessed by student 't' test. Variables showing P-value less than 0.05 were considered statistically significant.

OBSERVATIONS

The present study titled "Study of microcytic hypochromic anemia in impact relation to low respiratory tract infection in geriatric population" was carried out and is described for it's observations as follows.

Subject characteristics

A total of fifty subjects with lower gastrointestinal symptoms were included in the study as they met the inclusion criteria let down for present study. Of these fifty patients, 28 patients were male patients and 22 patients were female patients. (Table 1).

Table 1: Distribution of study subjects according to their age and gender.

Age group	Male	Female	Total
65 – 74 yrs	17	15	32(64%)
> 75 yrs	11	7	18(36%)
Total	28(56%)	22(44%)	50

There were 32 cases with LRTI who were from age group of 65 – 74 years with 18 cases belonging to the age above 75 years.

Table 2: Shows the mean values of Hb, MCV and MCH in cases and controls.

	65 – 74 yrs		> 75 yrs	
	Cases	Control	Cases	Control
Hb	8.7±1.05	9.6±1.1	8.4±1.2	8.3±1.4
MCH	30.2±2.4	29.3±2.8	29.6±2.6	29.3±2.3
MCV	81±9.6	83±10.4	78±9.2	80.4±8.3

Table 3.

	Total	
	Case	Control
Microcytic hypochromic anemia	21	6
Normocytic normochromic anemia and other blood picture	29	44
P value	<0.01	

From table 2 and 3, distribution of cases based on Hb, MCV, MCH and peripheral smear examination showed highest number of cases of normocytic normochromic anemia followed by microcytic hypochromic anemia. As shown in table 3 microcytic hypochromic anemia patients are significantly higher in cases as compared to controls.

DISCUSSION

Anemia is a common concern in geriatric age group and can have significantly more severe complications than anemia in younger adults. Anemia of chronic disease is the most common form of anemia in the elderly which may be the cause for highest prevalence of normocytic anemia. Geriatric patients with lower respiratory tract infections who develop anemia have increased morbidity and mortality.

Bont et al^[3] in concordance with the present study found that maximum number of cases of lower respiratory tract infections belong to the age group of 66 to 75years.

Cote et al^[4] and Lee et al^[6] corroborated with the findings of the present study that lower respiratory tract infections in geriatric patients have low levels of hemoglobin.

Shrivastava et al^[9] in concordance with the present study found elderly patients with lower respiratory tract infections show normocytic normochromic anemia followed by microcytic anemia sharing the predominant distribution of anemia.

CONCLUSION

In elderly patients with lower respiratory tract infections, hemoptysis is common and results in chronic blood loss which is the reason for iron deficiency and thus iron deficiency. Thus pre existing lower respiratory infection in geriatric population increases the chances of microcytic anemia in these patients and should always be investigated for in these patients.

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