

To Study the Prevalence and Severity of Anemia in Solid Malignancy Patients

Uthaya Sankar M.K.¹, Raja M², Damodaran Kumaran P³

¹Professor and Unit Chief of Medicine, Department of General Medicine, Sri Manakula Vinayagar Medical College and Hospital, Puducherry 605107

²Postgraduate Residents, Department of General Medicine, Sri Manakula Vinayagar Medical College and Hospital, Puducherry 605107

³Assistant Professor of Oncology, Department of General Medicine, Sri Manakula Vinayagar Medical College and Hospital, Puducherry 605107

Corresponding Author: Raja M

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ABSTRACT

Background: Anemia in solid malignancy may be due to tumor-associated bleeding, hemolysis, hypersplenism, reduced production of EPO, nutritional deficiencies, bone marrow failure and toxicity associated with therapies which increases the mortality.

Aim: To study the prevalence and severity of anemia in solid malignancy patients.

Methods: Hospital based -cross sectional study done on patients above 18 years with solid malignancy with elevated C-reactive protein level (CRP). Sample size was 50. Complete blood count, peripheral smear and CRP were measured.

Results: Among 50 patients, the overall prevalence of anemia in solid malignancy with elevated CRP was 100%. The mean hemoglobin was lower in female patients 8.2 ± 1.40 g/dl (mean \pm SD) compared with male patients 8.4 ± 2.01 g/dl (mean \pm SD). 62% patients were having elevated CRP value ranges from 0.6mg/dl to 1 mg/dl with a mean hemoglobin of 8.3 ± 1.32 (mean \pm SD) and 38% were having CRP of more than 1mg/dl with a mean hemoglobin of 8.1 ± 1.02 (mean \pm SD). Among the different types of malignancy, colorectal and gynecological tract group were found to have low mean hemoglobin value of 7.8 ± 1.04 (mean \pm SD) and 7.9 ± 1.13 (mean \pm SD). Most of them were having moderate anemia (70%) and normocytic normochromic anemia (78%).

Conclusion: The overall prevalence of anemia in solid malignancy patients with elevated

inflammatory marker like CRP was 100%. Most of them were having moderate anemia (70%), normocytic normochromic type (78%).

Keywords: Anemia, Solid malignancy, Hemoglobin.

INTRODUCTION

Anemia is a common complication in cancer patients, which compromises the quality of life and increases the mortality. Early identification and treatment will improve the clinical outcomes and survival of the patients.

Anemia can be classified as mild, moderate, severe. According to WHO guidelines hemoglobin level of 11 to 12.9g/dl in adult men, 11 to 11.9g/dl in adult female is considered as mild anemia, 8 to 10.9g/dl as moderate anemia, <8g/dl as severe anemia.

The pathogenesis of anemia in solid malignancy patients is more complex and multi-factorial. Different mechanism can contribute to anemia in solid tumour patients [1]. Some of the common causes include malnutrition and malabsorption which leads to nutritional deficiency of iron, folate, vitamin B12, acute or chronic bleeding, systemic inflammation, metastatic infiltration of bone marrow, and chemotherapy-related myelosuppression. Rarely anemia may develop from

hemolysis, hemophagocytosis and hypersplenism.

Occult bleeding and iron deficiency are important cause of anemia in gastrointestinal, urogenital and gynecological tumors and bone marrow replacement by metastases is seen in breast and prostate cancer [2]. Erythropoietin deficiency can occur in concurrent chronic kidney disease patients which also leads to anemia [3].

Anemia in solid tumour may be associated with broad spectrum of symptoms. Most common symptom is fatigue[4,5], followed by impaired mental capacity, confusion, depression in elderly patients. nausea, loss of appetite, dyspnea, syncope can occur in patients with cardio-pulmonary and renal disease. Even in mild anemia can affect the quality of life in solid tumour patients.

Aims And Objectives

1. To analyse the prevalence of anemia in solid malignancy patients.
2. To assess the severity and type of anemia in solid malignancy patients.

MATERIALS AND METHODS

This study was done under the department of general medicine at Sri Manakula Vinayagar Medical College and Hospital, a tertiary care hospital situated at Puducherry. The design employed was a hospital based analytical cross sectional study. Informed written consent was taken from the patients or their attendants after explaining about the purpose of the study. All patient with 18 years of age or above with already confirmed solid malignancy by

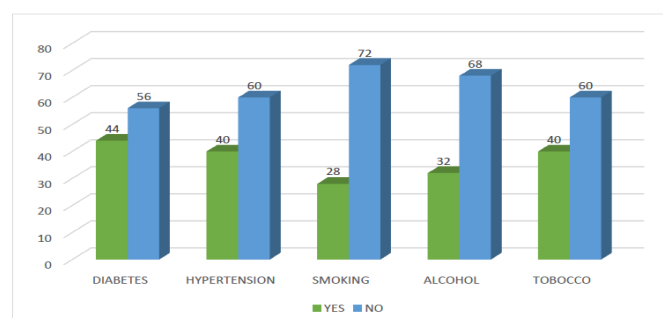
histopathological method with elevated C reactive protein level were included in the study. Patients below age of 18 years and having sepsis, hematological malignancies, chronic renal failure, underwent chemotherapy were excluded from the study.

All patients underwent detailed history and thorough clinical examination to check for signs of anemia. Five milliliter of venous blood was collected for estimation of Hb, Hematocrit, CRP, MCV, MCHC, MCH and peripheral blood smear examination. Final reports were analysed for prevalence, type and severity of anemia in solid malignancy.

Ethical consideration: The study protocol was approved by the SMVMCH - Institutional Ethics Committee (No.EC/59/2021). Voluntariness, privacy and confidentiality was maintained throughout the study.

RESULTS

1. Distribution of socio-demographic factors: out of 50 patients, 33(66%) patients were female and 17(34%) were male. From the age category,18(36%) patients were aged between 18 to 50 years and 32(64%) were aged more than 50 years. Co-morbidity category showed 22(44%) patients were having diabetes mellitus and 20(40%) were having systemic hypertension.
2. Distribution of risk factors :14 (28%) patients were smokers and 36 (72%) were non-smokers.16(32%) were alcoholics and 34 (68%) were non-alcoholics.20 (40%) were tobacco users and 30 (60%) were non-tobacco users.



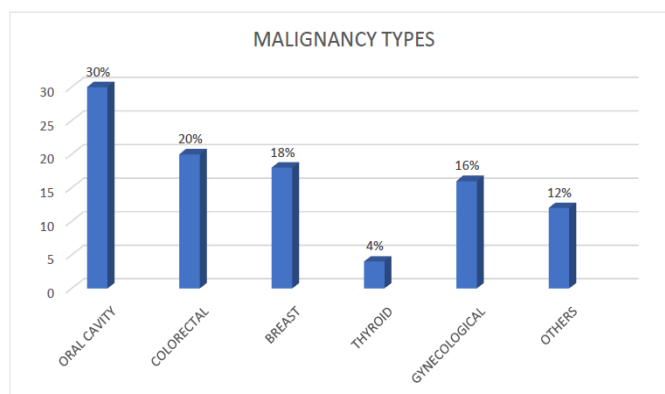
3. Prevalence of Anemia: All solid cancer patients were anemic and showed hemoglobin ranged from 5 g/dl to 11.8 g/dl with a mean of 8.8g/dl±1.41 (mean±SD). The mean hemoglobin for male patients was 8.4 ± 2.01g/dl and for female patients, 8.2±1.40 g/dl (mean±SD). Among the solid cancer

patients 62% patients were having elevated C-reactive protein (CRP) value ranges from 0.6mg/dl to 1 mg/dl with a mean hemoglobin of 8.3±1.32 (mean±SD) and 38% were having CRP of more than 1mg/dl with a mean hemoglobin of 8.1 ± 1.02 (mean±SD).

Variables	Frequency (n)	percentage (%)	Mean HB ± SD, g/dl
AGE (years)			
18 - 50	18	36	8.3 ± 1.12
> 50	32	64	8.0 ± 1.24
SEX			
Male	17	34	8.4 ± 2.01
Female	33	66	8.2 ± 1.40
CRP (mg/dl)			
>1	19	38	8.1 ± 1.02
<1	31	62	8.3 ± 1.32
MALIGNANCY TYPES			
Oral cavity	15	30.0	8.3 ± 1.62
Colorectal	10	20.0	7.8 ± 1.04
Breast	9	18.0	8.5 ± 1.60
Thyroid	2	4.0	8.9 ± 1.20
Gynecological Tract	8	16.0	7.9 ± 1.13
Others	6	12.0	8.6 ± 1.22
STAGES			
STAGE 1	13	26.0	8.3 ± 1.59
STAGE 2	21	42.0	8.2 ± 1.64
STAGE 3	15	30.0	8.1 ± 1.22
STAGE 4	1	2.0	8.6 ± 1.46

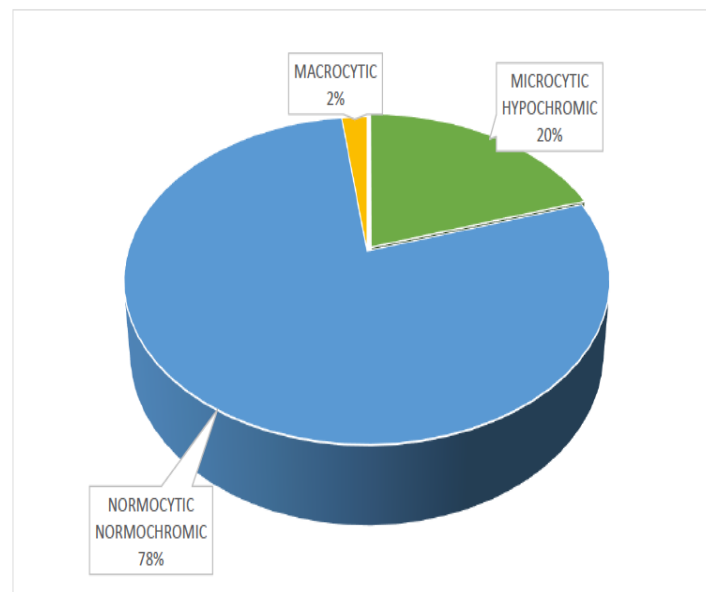
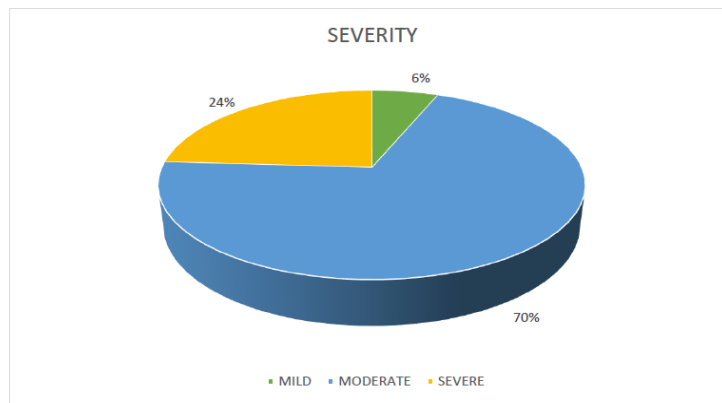
Among the solid malignancy patients, the frequency of malignancy types were oral cavity (30%) colorectal (20%) breast (18%) thyroid (4%) gynecological tract (16%) others (12%). Lower mean hemoglobin level was noted among colorectal group

showed 7.8±1.04 (mean±SD) and gynecological tract group showed 7.9 ± 1.13 (mean±SD). Most of the patients were belong to stage 2 and stage 3 with mean hemoglobin of 8.2 ± 1.64 (mean±SD) and 8.1 ± 1.22 (mean±SD).



4. Severity and types of anemia: Among the solid malignancy patients, 70% patients were having moderate anemia and 24% were having severe anemia.

Peripheral blood smear examination showed normocytic normochromic anemia of 78% and microcytic hypochromic anemia of 20%.



DISCUSSION

Anemia in cancer patients observed as a result of the malignancy itself, anti-cancer treatment, blood losses, nutritional deficiencies, hemolysis, endocrine disorders, or inflammatory cytokines associated with chronic diseases.

According to this study, the overall prevalence of anemia across different solid malignancy was 100%, which is higher than the study conducted in Ethiopia, 23% [6]. The mean hemoglobin was lower in female patients (8.2g/dl) and among patients with CRP of more than 1mg/dl (8.1g/dl).

Among the different types of malignancy, colorectal and gynecological tract group were found to have low mean hemoglobin value of 7.8g/dl and 7.9g/dl. This study showed 70% were having moderate anemia which is contrast to study conducted by

Chowdhary GS et al, which showed prevalence of 27.6% [7]. The majority of the anemia in our study was normocytic normochromic (78%), which was different from the study done in Ethiopia (59%).

CONCLUSION

In our study the overall prevalence of anemia in solid malignancy patients with elevated inflammatory marker like CRP was 100%. Most of them were having moderate anemia (70%), normocytic normochromic type (78%).

Limitations

The study sample is less and study is done in single hospital setting. This study does not contain any comparative group. Extensive workup for the etiology of anemia couldn't be done.

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REFERENCES

1. Gilreath J.A., Stenehjem D.D., Rodgers G.M. Diagnosis and treatment of cancer-related anemia. *Am. J. Hematol.* 2014; 89: 203–212.
2. Gaspar B.L., Sharma P., Das R. Anemia in malignancies: Pathogenetic and diagnostic considerations. *Hematology.* 2015;20:18–25.
3. Adamson J.W. The anemia of inflammation/malignancy: Mechanisms and management. *Hematol. Am. Soc. Hematol. Educ. Program.* 2008;2008:159–165.
4. Van Eeden R., Rapoport B.L. Current trends in the management of anaemia in solid tumours and haematological

- malignancies. *Curr. Opin. Support Palliat. Care.* 2016;10:189–194.
5. Harper P., Littlewood T. Anaemia of cancer: Impact on patient fatigue and long-term outcome. *Oncology.* 2005;69:2–7.
6. Kifle E, Hussein M, Alemu J, Tigeneh W, "Prevalence of Anemia and Associated Factors among Newly Diagnosed Patients with Solid Malignancy, Ethiopia", *Advances in Hematology.* 2019;1- 8.
7. Kishore K, Choudhary G, Bagga G. "prevalence of anemia in patients with solid tumors: a single center cross-sectional study at a tertiary care center in west india". *international journal of scientific research.* 2020;9:1-3.

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