Original Article

Hematological Manifestation in Lung, Breast and Git Malignencies: A Discriptive Study

Nilima Chaudhari and Shaila Shah*

Department of Pathology, Government Medical College & Sir Takhtasinhji Hospital, Bhavnagar, Gujarat, India

ABSTRACT

Background: Malignancy is one of the principle causes of death both in developed and developing countries.

Methods: 102 lung, GIT and Breast malignancies patients were selected. The various hematological abnormalities in lung, GIT and breast malignances were evaluated by estimation of hematological parameter. Complete hematological investigation was performed using Abbott cell-3700dyn hematology analyzer and peripheral smear using Field's stain.

Result: Hematological abnormalities were seen in Lung, GIT and Breast malignances. The Anemia in 71(69.6%) cases of malignancies is most common hematological manifestation. The predominant peripheral smear finding was that of normocytic normochromic anemia (57.7%). The prevalence of leucocytosis and thrombocytosis were 33.3% and 36.2%.

Conclusion: The present study showed a definite association of hematological manifestations viz anemia, leucocytosis and thrombocytosis with lung, GIT and breast malignancies.

Keywords: Hematological Manifestation, Lung, GIT and Breast Malignancies

Introduction

Malignancy is one of the principal causes of death both in developed and developing countries. Malignancy results by uncontrolled division of cells and the ability of these cells to invade other tissues, either directly or by metastasis. There are many types of cancers that present with diversified symptom [1]. An abnormal hematological picture may be the first manifestation of many non-hematological malignancies. The various hematological manifestations can be: anemia, polycythemia, leucocytosis, thrombocytosis, monocytosis, eosiniophilia etc. Mechanisms responsible for hematological abnormalities include production of several humoral factors by cancer cells and normal splenic cells of cancer bearing patients. Granulocyte-macrophage colony stimulating factor (GM-CSF), interleukin-6, interleukin -1 and tumor necrosis factor have been implicated. These tumor generated substances mimic or block normal hematopoiesis or generate antibodies that cross react with receptors on cell lineage or by direct invasion of bone marrow[1].Anemia is one of the common finding in cancer patients. Iron deficiency anemia has long been recognized as a feature of colon-rectal cancer. Anemia may be the result of malignancy itself, acute or chronic blood loss, hemolysis, marrow suppressive effects of therapy or because of anemia of chronic diseases[2,3,4]. In addition interaction of immune system with iron metabolism and erythropoiesis is known to be an important factor in the development of anemia in cancer patients[5,6,7].Elevation of the white cell count is also seen in various types of non-hematological malignancies especially in patients of lung cancer[8]. The degree of leucocytosis is usually modest (less than 15,000 cells / cu mm), however the development of metastasis, particularly to the liver and the lung may be followed by a marked increase in the white cell count. Eosinophilia and monocytosis which may be the early signs of malignancy are also very common and occur in majority of patients. Eosinophils are normally associated with allergic diseases or responses to various parasitic infections, but extensive eosinophilia can be seen in hematological tumors such as Hodgkin's disease and certain lymphomas; however many other types of cancers such as colon, cervix, lung, breast and ovary may also be associated with eosinophilia. [1]Malignancy is one of the most important causes of secondary or reactive thrombocytosis (Platelet count greater than 4 lakh/cu mm). Thrombocytosis has been reported in several solid tumors including lung, renal, breast, pancreatic, colonic malignancies [9].

Materials and Methods

The present study was conducted in pathology department of Sir T. hospital Bhavnagar. Total 102 cases of lung, breast and GIT malignancies included in study. 2ml of blood sample was drawn and dispensed in to EDTA vaccute for various hematological parameters. Complete blood count (CBC) using Abbott cell-3700dyn hematology analyzer was done

which includes: 1) Hemoglobin, 2)Total Leucocyte count (TLC), 3)Differential leucocyte count (DLC),4)Packed cell volume (PCV)/ Haematocrit, corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration 5).Platelet count 6)Detailed peripheral blood examination using Field's stain and parameters by automated hematology analyzer correlated on peripheral blood smear, manual TLC and DLC carried out in discrepancies.

Result

The present study was prospective in nature, conducted on 102 cases having lung, GIT and breast malignancies diagnosed and admitted in Sir T. hospital, Bhavnagar. Out of total 102 cases of malignancies included in the study, 34 cases are of Lung, 34 cases are of GIT and 34 cases are of breast malignancies. In this study hematological manifestations (anemia, leucocytosis, different type of leucocytosis and thrombocytosis) seen, which are distributed according to prevalence and depicted in below following table and charts.**Fig.1** Out of 102cases of malignancies, 52.1% cases of female patients and 47.8% cases of male patients are having anemia.**Fig.2** Out of 102 cases, 70.5% cases of lung, 64.7% cases of GIT and73.5% cases of breast malignancies are having Anemia.**Fig.3** Out of 102 cases of malignancies,41.1% cases of lung, 35.2%cases of GIT and 23.5% cases of breast malignancies are having leukocytosis. **Fig.4** Out of 102 cases of malignancies,32.3% cases of lung, 41.1% cases of GIT and 35.2%cases of breast cancer are having thrombocytosis. **Table 1** In this study, out of 34 cases of lung malignancies,11.7% patients have neutrophilia,11.7% patients have lymphocytosis,2.9%patients have eosinophilia, and 5.8%patients have monocytosis.Out of 34 cases of GIT malignancies, 8.8% patients have neutrophilia and 11.7% patients have lymphocytosis. In this study, out of 34 cases of breast malignancies, 8.8% patients have neutrophilia, 5.8% patients have lymphocytosis and 2.9% patients have monocytosis.

Table 1:Distribution prevalence of different types of leukocytosis according to malignancies.

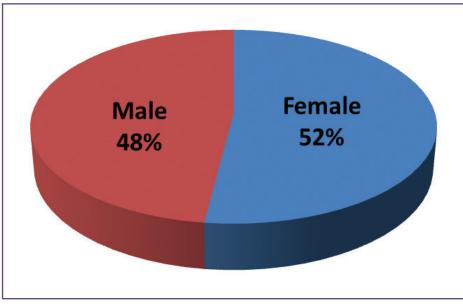| Type of Leukocytosis	Lung		GIT		Breast	
	No. of patients	(%)	No. of patients	(%)	No. of patients	(%)
Neutrophilia	4	11.7%	3	8.8%	3	8.8%
Lymphocytosis	4	11.7%	4	11.7%	2	5.8%
Eosinophilia	1	2.9%	0	0	0	0
Monocytosis	2	5.8%	0	0	1	2.9%
Basophilia	0	0	0	0	0	0

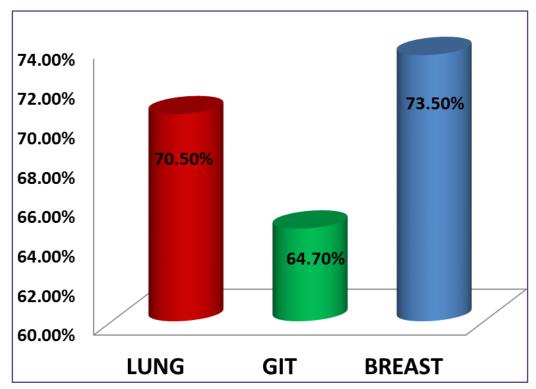**Fig. 1: Distribution prevalence of anemia according to sex.**

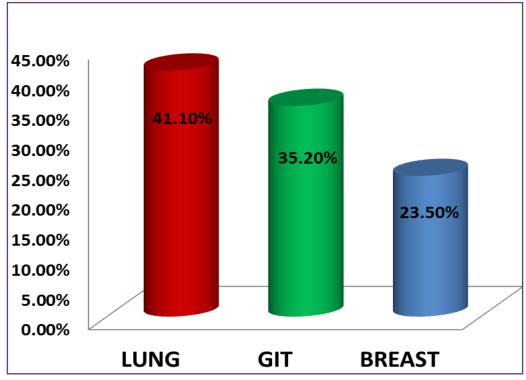**Fig. 2: Distribution prevalence of anemia according malignancies.**

Fig. 3: Distribution prevalence of leucocytosis according to malignancies.
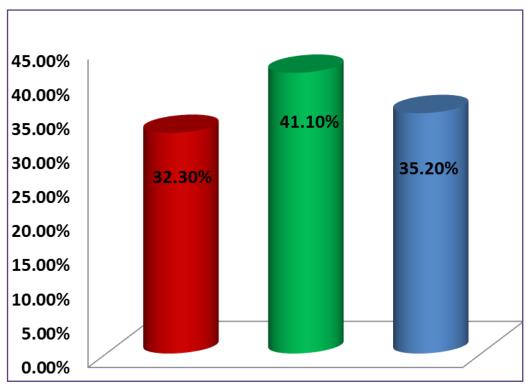
Fig. 4: Distribution prevalence of thrombocytosis according to malignancies.

Discussion

In the present study, hematological manifestations in lung, GIT and Breast malignancies characterized by various hematological parameters were studied. The prospective study of Lung, GIT and breast malignancies involving 102 patients was undertaken during period of August 2016 to july 2017. The observations were compiled, results analyzed and discussed with previous similar studies. Anemia observed as most common hematological finding, almost in lung, GIT and breast malignancies. Out of total 102 cases with lung, GIT and breast malignancies, 71(69.6%) cases are anemic which corresponds to study done by Kalyani et al[2], Gupta et al[1] and Varlotto et al[10]. Prevalence of anemia varied by cancer type and disease stage as cited by Knight et al[12]. In our study, Normocytic normochromic anemia detected in 57.7% cases and microcytic hypochromic anemia detected in 42.2% cases of malignancies, which is similar to the study done by Gupta et al[1] and Schwartz et al[11]. They also found anemia as one of the most common finding in cancer patients, which is usually normocytic normochromic. In our study , leukocytosis detected in 33.3% cases out of 102 cases of malignancies at the time of diagnosis, which is similar to the study done by Shoenfeld et al[13], Gupta et al[1] and Granger et al[14], observed increases leucocytes count in malignancies. Among the leukocytosis, neutrophilia was seen in 29% cases out of 102 cases of malignancies, which is similar to the study done by Gupta et al[1] and Granger et al[14]. Granger et al also described that patients with leukocytosis typically had neutrophil predominance (96%) and radiographic evidence of metastatic disease. In these study, 5 cases out of 34 cases of lung malignancy show 11.7% cases of neutrophilia and 2.9% case of eosinophilia similar findings were reported by Gupta et al[1]. One case of lung malignancy showed leukemoid reaction with TLC of 31,000/cu mm and 90% of them are neutrophils, similar findings were reported by Gupta et al[1]. Shoenfeld et al[13] also reported monocytosis to the tune of 25 % among patients with non-hematological malignancies at the time of diagnosis but in our study, only 8.8% cases out of 102 have monocytosis, which included 1 case of breast and 2 cases of lung cancer. Thrombocytosis, important hematological finding detected in malignancies. Increased platelet count is found in 36% cases out of total 102 in the present study, which corresponds to study done by Gupta et al[1] and Pederson et al[15].

Conclusion

Hematological changes in non-hematological malignancies of lung, breast, GIT system are anemia, leukocytosis (neutrophilia, eosinophilia, monocytosis) and thrombocytosis. Anemia of normocytic normochromic type is most commonly seen in females. Malignancies in

developing countries like us, detected usually in late stages due to limited resources, lack of patient's awareness and other socio-economic factors. In malignancies, abnormal hematological finding if detected early in the course of disease can aid to diagnose early, prevent associated morbidity and mortality, helps in better patient care.

Reference

1. Gupta A, Singh T and Gupta S. Hematological Manifestations In Non-Hematological Malignancies. International Journal of Bioassays 2015;4(10): 4376-4378

2. Kalyani P, Perimi R, Kameshwari SV, Assessment of severity of anemia and its effect on the quality of life (QUL) of patients suffering with various types of neoplasia. Biology and medicine 2009;1(3): 63- 72.

3. Caro JJ, Salas M, Ward A: Anemia as an independent prognostic factor for survival in patients with cancer: A systemic, quantitative review. Cancer 2001;91:2214-2221.

4. Cella D, Lai JS, Chang CH, Peterman A, Slavin M. Fatigue in cancer patients compared with fatigue in the general United States population. Cancer 2002;94 (2):528-38

5. Cleeland CS, Demetri GD, Glaspy J, Cella D. Identifying Hemoglobin Level for Optimal Quality of Life: Results of an Incremental Analysis. American Society of Clinical Oncology, 35th Annual Meeting, Atlanta, [Abstract 2215]. 1999

6. Cazzola M, Mechanisms of anemia in patients with malignancy: implications for the clinical use of recombinant human erythropoietin. Medical Oncology, 2000;17(1):S11-S16.

7. Demetri GD, Ellen Thackery, Thomson Gale,. Anemia and its functional consequences in cancer patients: current challenges in management and prospects for improving therapy. British Journal of Cancer, 2001;84(1):31-37.

8. Kasuga I, Makino S, Kiyokawa H, Katoh H, Ebihara Y, Ohyashiki K. Tumor related leukocytosis is linked with poor prognosis in patient's with lung carcinoma. 2001 ;92(9): 2399-405.

9. Dacie and Lewis. Practical Hematology, 10th edition. Churchill Livingstone Publication, 2006.

10. Varlotto J, Stevenson MA. Anemia, tumor hypoxemia and the cancer patient. Int J Radiat Oncol Biol Phys .2005;63(1): 25-36.

11. Schwartz RN. Anemia in patient's with cancer: incidence, causes, impact, management and use of treatment guidelines and protocols. Am J Health Syst Pharm, 2007; quiz S28-30. 12. Knight K, Wade S, Balducci L. Prevalence and outcome of anemia in cancer: asystematic review of the literature. Am J Med,2004; 11 S-26 S.

13. Shoenfeld Y, Tal A, Berliner S, Pinkhas J. Leucocytosis in Non hematological Malignancies - A possible tumor associated marker. J cancer Res Clin Oncol. 1986 ;11:54-58

14. Granger JM, Kontoyiannis DP. Etiology and outcome of extreme leucocytosis in 758 non hematologic cancer patients: a retrospective single institution study. Cancer 2009;115(17): 3919-23.

15. Pederson LM, Milman N. Diagnostic significance of platelet count and other blood analysis in patients with lung cancer. 2003;10(1):213-6.

*Corresponding author:
Dr. Shaila N. Shah, Professor and Head, Department of Pathology, Govt. Medical college, Bhavnagar, Gujarat-364001, India
Email: shaila.shah158@yahoo.com