



HEMATOLOGICAL MANIFESTATIONS IN NON-HEMATOLOGICAL MALIGNANCIES

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Abstract: Malignancy is one of the principal causes of death both in developed and developing countries. An abnormal hematological picture may be the first manifestation of many non-hematological malignancies. The present study was conducted to detect the hematological abnormalities in patients with solid tumors and to correlate these parameters with the histological diagnosis and clinical stage of the tumor. Fifty cases of Non-hematological malignant tumors were taken up in the study. Their blood samples were taken at the time of diagnosis i.e before the treatment and detailed hematological investigations were done. Diagnosis of these patients were confirmed by histological and cytological examination. Out of these 50 patients, 27 were females and 23 were males. In our study, anemia was observed as an important hematological finding in almost every malignancy, out of total 50 cases with various non-hematological malignancies, 37 were anemic (74%). Leucocytosis was detected in 25 out of 50 cases (50%) and increased platelet count (Thrombocytosis) was found in 17 cases out of total 50 (34%) in the present study. The present study showed a definite association of hematological manifestations viz. anemia, leucocytosis and thrombocytosis with various non-hematological malignancies, which if detected early in the course of disease can prevent associated morbidity and mortality and surely help in better patient care.

Key Words: Hematological manifestations; Non-Hematological Malignancies.

INTRODUCTION

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 symptoms. 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, eosinophilia 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 tumour necrosis factor have been implicated. These tumour 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. Anemia is one of the common finding in cancer patients. Iron deficiency anemia has long been recognized as a feature of colo 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 disease. 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.

Elevation of the white cell count is also seen in various types of non-hematological malignancies especially in patients of lung cancer¹. The degree of leucocytosis is usually modest (less than 15000 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. Malignancy is one of the most important causes of secondary or 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 and gynaecologic malignancies.

MATERIALS AND METHODS

The present study was conducted in pathology department of our institute. Fifty cases of Non-hematological malignant tumors were taken up in the study. 3ml of blood sample was drawn and dispensed in to EDTA vial for various haemological investigations.

Following investigations were carried out in all the patients:-

- Complete blood count (CBC)
- Haemoglobin estimation was done using the automated cell counter/ cynmethaemoglobin method (Dacie & Lewis).
- Total Leucocyte count (TLC) was done by automated cell counter and confirmed by Neubauer counting chamber. (Dacie & Lewis).
- Differential leucocyte count (DLC) was done by automated cell counter, and confirmed on PBF using oil immersion lens.
- Packed cell volume (PCV)/ Haematocrit, corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration was estimated using automated cell counter. (Dacie & Lewis).
- Platelet count was done using automated cell counter (Dacie & Lewis) and confirmed on PBF examination.
- Reticulocyte count was done by staining the blood film with supravital stain (Dacie & Lewis)
- Detailed peripheral blood examination was carried out after staining the blood film by Romanowsky stains (Leishman/ May Grunwald Giemsa)

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RESULTS

The present study was prospective in nature, conducted on 50 cases of different non – hematological malignancies received in the various sections of department of pathology. Out of these 50 cases, 27 were females and 23 were males. Table 1 shows sex and malignancy wise distribution of patients. Distribution of anaemia according to sex has been depicting in table 2. Table 3 shows the distribution of various types of anaemia, Comparison of anemia, leucocytosis and platelet counts in the form of number of cases and according to stage of disease have been shown in table 4. Table 5 shows the distribution of cases according to different types of leucocytosis. Comparison of total leucocyte count (TLC) and platelet count according to number of cases has been depicting in table 6.

Table 1: Distribution of patients according to sex and malignancy.

S.No	Malignancy	Females	Males	Total
1	Breast	12	0	12
2	Cervix	4	0	4
3	Colon	1	3	4
4	Prostate	0	3	3
5	Thyroid	3	1	4
6	Oesophagus	1	1	2
7	Ovary	1	0	1
8	MHF	0	1	1
9	Larynx	1	1	2
10	Lung	1	4	5
11	Rectum	0	2	2
12	Pancreas	1	0	1
13	Urinary Bladder	0	2	2
14	HCC	0	2	2
15	Stomach	0	3	3
16	Gall bladder	2	0	2
	Total	27	23	50

Table 2: Distribution of anaemia according to sex.

S.No	Sex	Total	Anemic	Total %
1	Females	27	20	74.07
2	Males	23	17	73.91

Table 3: Distribution of anaemia according to its types.

Type of anemia	No of cases	Percentage (%)
Normocytic Normochromic	25	50
Microcytic Hypochromic	25	50
Macrocytic Normochromic	0	0

Table 4: Distribution of cases according to findings (anemia, leucocytosis, platelet counts) and stage of disease.

S.No	Stage	No Of Cases	Anemia (No Of Cases)	% Age	Leucocytosis (No Of Cases)	% Age	Platelet count (No Of Cases)	% Age
1	I	13	8	61.53	6	46.15	0	0
2	II	15	10	66.66	7	46.66	5	33.33
3	III	11	9	81.81	6	54.54	4	36.36
4	IV	11	10	90.90	7	54.54	8	72.72

Table 5: Distribution of cases according to types of leucocytosis.

Types of Leucocytosis	No of Cases (N=25)	Percentage (%)
Neutrophilia	15	60
Eosinophilia	7	28
Monocytosis	3	12
Lymphocytosis	0	0
Basophilia	0	0

Table 6: Distribution of TLC and platelet count in 50 cases of various malignancies.

TLC	No of cases (N=50)	% age	Platelet count (lakhs/cumm)	No of cases (N=50)	% age
<4.0	2	4	<1.5	4	8
4-11	23	46	1.5-4.0	29	58
11-50	25	50	>4.0	17	34

DISCUSSION

In our study, anemia was observed as an important hematological finding in almost every malignancy, out of total 50 cases with various non-hematological malignancies, 37 were anemic (74%) which corresponds to the study done by various others authors^{3,4}. There were equal number of cases (25 each) with normocytic normochromic and microcytic hypochromic anemia. Schwartz⁵ also found similar results and reported anemia as one of the most common finding in cancer patients, which is usually normocytic normochromic. Prevalence of anemia varied by cancer type and disease stage as cited by Knight et al⁶ nearly 80% of patients with advanced stage disease had anemia which is almost similar to our study where maximum number of 10 cases out of 11 (90.90%) had anemia in stage IV as compared to 81.81% in stage III, 66.66% in stage II and 61.53% in stage I. In the present study, leucocytosis was detected in 25 out of 50 cases (50%) in 16 different types of non-hematological malignancies at the time of diagnosis. This corroborates the findings of various other authors^{7,8}. Among the leucocytosis, it was neutrophilic leucocytosis seen in maximum 15 cases out of 25 (60%). Granger et al⁹ also described that patients with leucocytosis typically had neutrophil predominance (96%) and radiographic evidence of metastatic disease. In our study 4 cases out of 5 with lung carcinoma showed leucocytosis. Out of those 4 cases, 2 had neutrophilia and 2 had eosinophilia. One case showed leukemoid reaction with TLC (total leucocyte count) of 28,000/cu mm and 80% of them were neutrophils, similar findings were reported by various other authors^{10,11,12}. Shoenfeld et al also reported monocytosis to the tune of 25 % among patients with non-hematological malignancies at the time of diagnosis but in our study, only 3 cases out of 25 (12%) had monocytosis, which included one case each of gallbladder, lung and ovarian cancer. Increased platelet count was found in 17 cases out of total 50 (34%) in the present study. This corroborate the findings by other authors^{13,14,15}.

CONCLUSION

The present study showed a definite association of hematological manifestations viz anemia, leucocytosis (neutrophilia, eosinophilia, monocytosis) and thrombocytosis with various non-hematological malignancies, which if detected early in the course of disease can prevent associated morbidity and mortality and surely help in better patient care.

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