

# THE INCIDENCE OF UNDERLYING PATHOLOGY IN PANCYTOPENIA – AN EXPERIENCE OF 89 CASES

Mussarrat Niazi, Fazl-i-Raziq

*Khyber Medical College, Peshawar  
Postgraduate Medical Institute, Peshawar*

## ABSTRACT

**Objective:** The aim of this study is to compare retrospectively, the incidence of underlying pathology and the salient clinical features of pancytopenia in northern region of Pakistan.

**Material and Methods:** 89 cases of pancytopenia were included in the study over a period of one year at the Department of Pathology, Post graduate Medical Institute Lady Reading Hospital Peshawar, Pakistan.

**Results:** Majority of the patients (71%) fall in the age groups of 1-30 years. Weakness was the main presenting feature (68.2%) while pallor was the predominant clinical feature (98.8%). The most common cause of pancytopenia as revealed by bone marrow was Aplastic Anemia (38.3%) followed by Megaloblastic Anemia (24.7%).

**Conclusion:** Aplastic anemia, Megaloblastic anemia, Hypersplenism and Acute leukemia are the most common causes of Pancytopenia in Northern region of Pakistan.

**Key word:** Pancytopenia, Aplastic anaemia, Megaloblastic anemia, Hypersplenism, Acute leukemia.

## INTRODUCTION

Pancytopenia is not a disease entity but a triad of findings that may result from a number of disease processes. These disorders may effect bone marrow either primarily or secondarily, resulting in the manifestation of pancytopenia<sup>1</sup>. The presenting symptoms are usually attributable to anemia or thrombocytopenia; Leucopenia is an uncommon cause of the initial presentation but can

become the most serious threat to life during the course of the disorder. The incidence of various disorders causing pancytopenia varies due to geographical distribution and genetic disturbances<sup>2,3</sup>. The management and prognosis of pancytopenia depends on the underlying pathology.

The aim of this study is to compare retrospectively, the incidence of underlying pathology and the salient clinical features of pancytopenia in northern region of Pakistan.

## MATERIAL AND METHODS

This study was carried out from January to December 2000 at the Department of Pathology, Post graduate Medical Institute Lady Reading Hospital Peshawar, Pakistan. A total of 472 bone marrow examinations were carried out and out of these 89 presented with pancytopenia. Criteria for inclusion in the study were Hb < 10gm/dl, TLC < 4000/cmm, and platelet count < 100,000/cmm. A detailed history and clinical examination was carried out in each case and the relevant information noted in a proforma. Bone marrow aspiration was performed using Saleh needles from iliac crest or tibial tuberosity. Trepchine biopsy was performed in 22 cases. A full blood count was done on hematology autoanalyzer; peripheral smear and reticulocyte count were also performed in each case. Leishman and iron stain were performed on the bone marrow smears.

## RESULTS

A total of 472 bone marrow examinations were carried out at Post Graduate Medical Institute Peshawar over a period of one year and among these 89 cases (19%) of pancytopenia were recorded. The gender distribution is given in Figure-1. Out of these 89 cases 56 (62.9%) were male and 33 (37.1%) were female. Male to Female Ratio is 1.7: 1. The age distribution is given in Figure -2. The youngest patient in this study was one

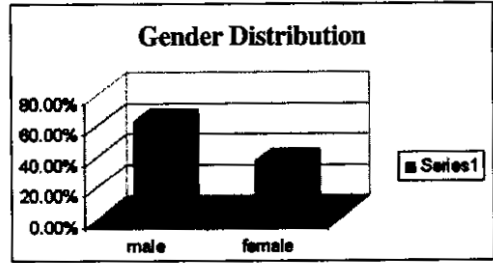


Fig. 1

year old while the oldest patient was 75 years old. The commonest age group was 21-30 years while 71% of the cases fall in the age groups of 1-30 years. Figure-3 shows the commonest presenting features. Weakness (68.2%) was the most common presenting feature followed by fever (47.7%) and bleeding (33.7%) respectively. Table-1 shows the common clinical features. It was found that pallor was the most common clinical feature followed by hepatomegaly.

The various causes of pancytopenia found in this study are given in Table-2. Bone Marrow Aplasia represented 38.3%, Megaloblastic Anemia 24.7% while Hypersplenism and Acute Leukemia represented 16% and 13.6% of the causes respectively.

### CAUSES OF PANCYTOPENIA

CAUSES	N	%
Bone Marrow Aplasia	31	38.3
Megaloblastic Anemia	22	24.7
Hypersplenism	13	16.0
Acute Leukemia	11	13.6
Abnormal Mononuclear Infiltrate	04	04.9
Malaria	02	02.4
Myelodysplasia	02	02.4
Peripheral Dystruction	02	02.4
Congenital Dyserythro-poetic Anemia	01	01.2
Visceral Leishmaniasis	01	01.2

TABLE - 2

### CLINICAL FEATURES

FEATURES	N	%
Pallor	88	98.8
Hepatomegaly	29	32.5
Splenomegaly	22	24.7
Petechie	18	20.2
Lymph nodes	7	7.8

TABLE - 1

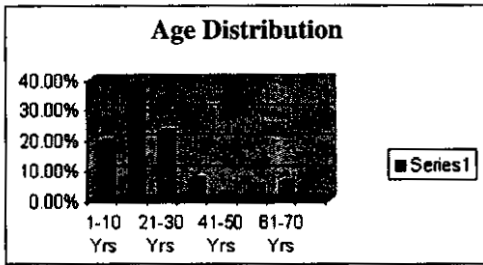


Fig. 2

## DISCUSSION

The bone marrow examination at Post Graduate Medical Institute Peshawar revealed 19% incidence of Pancytopenia while Basawari<sup>4</sup> encountered an incidence of 11.9% in total of 1813 bone marrow examinations. There has been little systematic study of the clinical spectrum of pancytopenia and the optimal diagnostic approach to pancytopenia remained undefined.

Pancytopenia is usually caused by bone marrow replacement or failure but is sometimes consequent on splenic pooling or peripheral destruction of mature cells. In hospital practice, pancytopenia is most often consequent on cytotoxic or immunosuppressive drug therapy<sup>5</sup>.

There are many causes of pancytopenia. The frequency of causes of pancytopenia has been reported in a limited number of studies. The commonest cause of pancytopenia in present study was aplastic anemia 38.27% whereas in other review it varies from 7.7% to 52.7%<sup>3,6,7,8</sup>. The second most common cause of pancytopenia in this study is megaloblastic anemia (22%) while in other

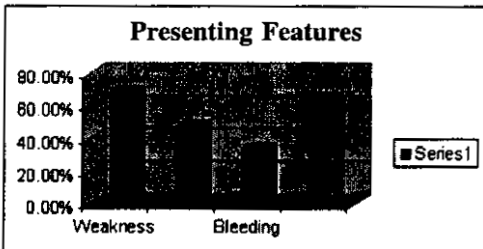


Fig. 3

similar studies it varied from 0.8% to 68%<sup>2,3,6,8</sup>. Yet in another study conducted in Malaysia, Pancytopenia was a common finding in 64% patients with Megaloblastic Anemia<sup>9</sup>. The high prevalence of nutritional anemias in India has been cited for the increased frequency of megaloblastic anemia<sup>7</sup>. Because of geographical and social similarities, nutritional anemias may also be responsible for increase frequency of megaloblastic anemia in northern region of Pakistan. Among the nutritional anemias, vitamin B12 deficiency is more prevalent than folate deficiency in Pakistan<sup>10</sup>.

The incidence of aplastic anemia in west is 10-25%, which is lower than observed in this study (38%). Aplastic anemia is thought to be more common in orient than in west. This increased incidence may be related to environmental factor such as increased exposure to toxic chemicals rather than genetic factors some this increase is not seen in people of oriental ancestry presenting living in US<sup>11,12</sup>. Easy availability of over the counter medicine could be implicated in aetiology of aplastic anemia. Studies from Thai land implicated pesticide exposure as a common aetiological agent for aplastic anemia<sup>13,14</sup>. As Pakistan is also an agricultural country, pesticide may be an important factor in the high incidence of aplastic anemia. Savage et al<sup>15</sup> observed that the most common cause of pancytopenia was megaloblastic anemia followed by aplastic anemia, acute leukemia, AIDS and hypersplenism while Kumar<sup>16</sup> reported the causes of pancytopenia in order of frequency as Aplastic Anemia 29.5% megaloblastic Anemia 22%, Aleukemic Leukemia or lymphoma 18% and hypersplenism 11.4%. In both these studies acute Leukemia was the third most common cause of Pancytopenia followed by hypersplenism but in this study hypersplenism was the third commonest cause followed by acute Leukemia.

## CONCLUSION

The physical and hematological examination play an important role in the investigation of pancytopenia. Aplastic Anemia, Megaloblastic Anemia, Hypersplenism and Acute Leukemia are the most common causes of Pancytopenia but rare causes like abnormal mononuclear infiltrate, malaria, myelodysplasia and peripheral destruction should also be kept in mind.

## REFERENCES

1. Darryl M William. Wintrobe's clinical Hematology 10<sup>th</sup> Edition Williams and Wilkins 1999; 1449.
2. International Agranulocytosis and Aplastic Anemia study group: Incidence of Aplastic Anemia; The relevance of diagnostic criteria. *Blood* 1987; 70: 1718.
3. Keisu M, Ost A. Diagnosis in patients with severe Pancytopenia suspected of having Aplastic Anemia. *Euro J Haematol* 1990; 45; 11.
4. Bashawari LA. Bone marrow examination- indication and diagnostic value. *Saudi Med J* 2002 ;23(2): 191.
5. Babara J Bain. *Blood Cell - A practical guide* 3<sup>rd</sup> Edition Blackwell science; 2000; 210.
6. Tilak V, Jain R Pancytopenia- a clinico hematologic analysis of 77 cases *Indian J Pathol Microbiol* 1999; 42: 399-404
7. Kishor Khodke, S Marwah, G Buxi, RB Yadav, NK Chaturvedi. Bone marrow examination in cases of Pancytopenia. *J Ind Acad of Clin Med*, 2001; 2; 55.
8. Verma N, Dash S. Reappraisal of underlying pathology in adult patients presenting with Pancytopenia. *Trop Geo Med* 1992; 44: 322
9. Ng SC, Kuperan P, Chan KS, Bosco J, Chan GL - Megaloblastic Anemia- a review from University Hospital, Kuala Lumpur. *Ann Acad Med Sing* 1988; 17: 261.
10. Modood-ul-Mannan, Anwar M, Saleem M, Wigar A, Ahmad MA. Study of serum vitamin B12 and folat levels in patients of megaloblastic anemia in northern Pakistan. *J Pak Med Assoc* 1995; 45: 187.
11. Sameer Bakhshi. Aplastic Anemia- Facts and statistics. *eMedicine journal*; 2001. 2(6); 1.
12. Young NS. Acquired aplastic Anemia. *Ann of Intel Med* 2002; 136(7):534.
13. Issaragrisil S, Chansung K, Kanfman DW, et al. Aplastic anemia in rural Thailand: its association with grain farming and pesticide exposure. *Am J Public Health* 1997; 87: 1551.
14. Kaufman DW, Issaragrisil S, Anderson T, et al. Use of household pesticides and the risk of aplastic anemia in Thailand. *Int J Epidemiol* 1997; 26: 643.
15. Savage DG, Allen RH, Gangaidzo IT, Levy LM, Gwanzura C, Moyo A et al pancytopenia in Zimbabwe. *Am J Med Sci* 1999 Jan 317: 22.
16. Kumar R, Kaira SP, Kumar H, Anand AC, Madan H - *J Assoc. Phys India* 2001; 49: 1078.

### Address for Correspondence:

Dr. Mussarrat Niazi  
Assistant Professor of Haematology,  
Khyber Medical College, Peshawar.