

Visceral leishmaniasis among children presenting with pancytopenia

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ABSTRACT

Background: Pancytopenia can result from either a failure of production of hematopoietic progenitors or peripheral destruction of a cellular element either due to infection, immune-mediated damage or hypersplenism. Visceral leishmaniasis (VL), one of the chronic parasitic diseases in the world that affects millions of people recently, leishmaniasis has been seen with increasing frequency in patients with Pancytopenia.

Objective: To determine the frequency of visceral leishmaniasis among children presenting with pancytopenia at Pediatric Department, Azad Jammu and Kashmir Medical College Muzaffarabad

Methodology This cross sectional study was conducted at the Department of paediatrics SKBZ/ CMH, Muzaffarabad. The study duration was 6 months from June 2018 to December 2018. All children with pancytopenia either of gender were enrolled. After taking informed demographic information, all the cases underwent bone marrow sampling to assess the Visceral Leishmaniasis. All the data was collected by self-made proforma.

Results: Total 75 patients were studied; their mean age of patients was 6.74±3.14 years. Males were in majority 67.69% and 32.31% were females. Leishmaniasis was found 15.38% of the cases. Leishmaniasis was statistically insignificant according to age and gender; p-values were quite insignificant.

Conclusion: It is concluded that the visceral leishmaniasis in children with pancytopenia was 15.38%.

Keywords: Visceral leishmaniasis, pancytopenia.

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Introduction

Pancytopenia is condition in which there is reduction of all the 3 peripheral blood lineage, it's common hematological problem countered in clinical practice and must be suspected on clinical grounds when a patient presents with unexplained pallor.¹ Pancytopenia is an important clinico-hematological entity encountered in our day-to-day clinical practice. It is a disorder in which all three major formed elements of blood (red blood cells, white blood cells and platelets) are decreased in number.² Bone marrow plays a vital role in understanding the etiology of pancytopenia. Timely identification of the intrinsic pathology would not only influence the morbidity as well as mortality of susceptible pediatric

sufferers but would also enable to manage the simplest and most easily curable condition.² In pancytopenia the marrow is customarily hypo-cellular as a result of primary production defects, it can be due to diminution of hematopoietic cell production, ineffective haemtopoiesis or may be due to peripheral devastation of cells.¹ Causes of pancytopenia vary widely ranging from minor nutritional deficiencies like megaloblastic anaemia to complete bone marrow failure as in cases of aplastic anemia and myelofibrosis. No matter what the underlying pathology, pancytopenia is a strong indication for bone marrow aspiration and trephine biopsy.³ Visceral leishmaniasis (VL) is a life-threatening parasitic infection transmitted by phlebotomine sandflies.⁴ Visceral leishmaniasis (VL) is a severe form of leishmaniasis - a

disease caused by protozoan parasites *L. donovani* and *L. infantum* and transmitted by the bite of certain species of sand fly. In VL, parasites migrate to the vital organs and bone marrow, destroying white and red blood cells.^{5,6} VL has been called the parasitic version of HIV/AIDS (Human immunodeficiency virus infection / acquired immunodeficiency syndrome), as it attacks the immune system. VL typically presents with prolonged fever, progressive pallor, weight loss and hepatosplenomegaly. Even though the disease is treatable, current treatments are difficult to administer, too expensive, or toxic for extensive use in developing nations.^{5,7,8} A local study was done on 67 cases of pancytopenia, they found they reported that leishmaniasis was seen in 20% cases, this study was not done specifically on pediatric populations.³ Limited data is available on frequency of visceral leishmaniasis in children with pancytopenia. Though this study was done in order to establish the frequency of Visceral Leishmaniasis so that proper treatment can be employed to have better treatment prognosis. This study will help to find out the new prevalence of visceral leishmaniasis in children diagnosed with pancytopenia, as this disease is much more common in Muzaffarabad region as compared to previous studies in other regions.

Methodology

This cross-section study was conducted at Department of paed SKBZ/ CMH, Muzaffarabad during six months from June 2018 to December 2018. All the patients with age 6 months to 12 years with Pancytopenia either of gender were included. Pancytopenia was defined as; anemia (Hb < 10g/dL), leukopenia (TLC <4000/ul) and thrombocytopenia (Platelets <150000/ul). Patients who underwent fresh blood transfusion, osteopetrosis, congenital aplastic anemia and thalassemia were excluded. After taking informed consent including demographic information the sample of bone marrow was send to hospital laboratory for analysis of Visceral Leishmaniasis that was diagnosed as bone marrow aspirates shows amastigotes of leishmania donovani. All the data was entered in self-made proforma. Data analysis was done by using SPSS version 20.

Results

The mean age of patients was 6.74±3.14 years with range of minimum 1 year and maximum 12 years. There were 44(67.69%) were male and 21(32.31%) were females. (Table I)

In this study leishmaniasis was found in 10(15.38%) of the cases. Figure 1

Leishmaniasis was diagnosed in 5(22.7%) cases aged < 6 years and in 5(11.6%) cases aged 6-12 years. The Leishmaniasis was statistically insignificant with respect to age groups, p-value > 0.05. Leishmaniasis was diagnosed in 5(11.4%) males and 5(23.8%) female cases, which was statistically insignificant according to gender p-value > 0.05. (Table II)

Table 1: Mean age and gender of the patients(n=75)

Variables		Statistics
Age	(Mean+S.D)	3.41±6.74 years
	Range (minimum- Maximum)	1-12 years
Gender	Males (frequency (%))	44(67.69%)
	Females (frequency (%))	21(32.31%)

Table II: Leishmaniasis with respect to age and gender (n=75)

Variables		Leishmaniasis		Total	p-value
		Yes	No		
Age groups	< 6 years	5(22.7%)	17(77.3%)	22(100%)	0.241
	6-12 years	5(11.6%)	38(88.4%)	43(100%)	
	Total	10(15.4%)	55(84.6%)	65(100%)	
Gender	Male	5(11.4%)	39(88.6%)	44(100%)	1.692
	Female	5(23.8%)	16(76.2%)	21(100%)	
	Total	10(15.4%)	55(84.6%)	65(100%)	

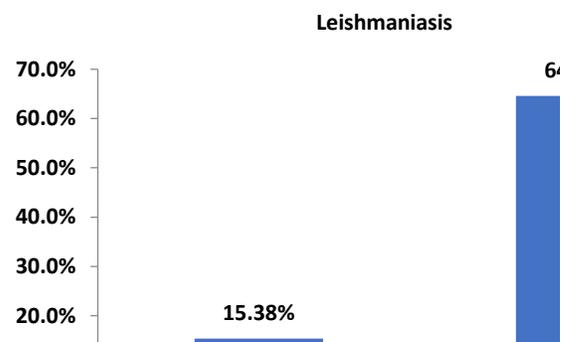


Figure 1. Leishmaniasis among children n=75

Discussion

Visceral leishmaniasis (VL), one of the deadliest parasitic diseases in the world, causes more than 50,000 human deaths each year and afflicts millions of people throughout South America, East Africa, South Asia, and

Mediterranean Region.⁹ Recently, this type of leishmaniasis has been seen with increasing frequency in patients who have AIDS or who are intravenous drug users or both, suggesting a potential transmission mechanism through contaminated syringes.¹⁰ Infected cases may present with symptoms of splenomegaly, loss of weight, weakness, irregular fever and anemia or pancytopenia occurring progressively during weeks or even months.¹¹

In current study leishmaniasis was found in 10(15.38%) of the cases having pancytopenia. A local study was done on 67 cases of pancytopenia; they reported that leishmaniasis was seen in 20% cases, this study was not done specifically on paediatric populations. This frequency was higher as found in current study. Another study reported that Visceral Leishmaniasis was seen in 3.75% in children of Pancytopenia.⁸ This frequency was lower as found in current study. In a study conducted by Khan TA et al⁸ stated that the common causes of pancytopenia were aplastic anemia (37.5%) followed by Megaloblastic anemia (13.75 %), Acute Leukemia (13.75%) and hypersplenism (10%). Visceral leishmaniasis was present in 3.75% cases. Another study was conducted on 67 cases of pancytopenia 15% were children and 52% were adults, among children of leishmaniasis and hypersplenism 20% had of pancytopenia followed by acute leukemia 3.8%, aplastic anemia 6.7% and megaloblasticanaemia 6.7%. Jan et al.¹² conducted a study to assess the various spectrum of pancytopenia with its frequency on the basis of bone marrow examination in children from 6 months to 14 years and leishmaniasis found 2.93%. A study was conducted in India to evaluate the etiological and clinico-hematological profile in children with bicytopenia and pancytopenia and visceral leishmaniasis was present in 2.0% of bicytopenia and 2.9% of pancytopenic patients.¹³

In this study mean age of patients was 6.74±3.14 years, which was higher as compared to Iranian study of Abdinia B et al⁶ as 17.94 months, and males were in majority which was similar to this study. Similarly in another study of Karagün BŞ et al¹⁴ reported that males were (50%) females were(50%) and mean age was 88±40 months.

May studies reported that the Visceral leishmaniasis is incurable, if left untreated and may characterized by fever, hepato-splenomegaly, weight loss, anemia progression, and pancytopenia.¹⁵⁻¹⁷ Around 50% of patients in Sudan and 5–10% in the Indian subcontinent

develop dermal leishmaniasis after recovery of Visceral leishmaniasis.¹⁵ In the study of Koster KL et al¹⁸ observed similar findings and stated that in pancytopenia, a thorough analysis of the bone marrow beyond the common focus on malignancy also searching for parasites, such as *Leishmania*, is important.

Conclusion

It was concluded that among in children having with pancytopenia the visceral leishmaniasis found to be 15.38%. Hence during treatment of pancytopenia Leishmaniasis must be ruled out and if found then must be treated accordingly. No particular studies have been found on particular association of pancytopenia and Visceral leishmaniasis hence further studies are suggested on this objective.

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