

**Original Research Paper****Hematological Profile in Plwha Patients in relation to their CD4+ Count**

Authors

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Dr M. Ramesh M.D**Introduction**

Global statistics say 36.7 million people are infected with HIV 1.8 million new cases every year. As per Indian statistics 2015 report, adults (14-49 yrs) HIV prevalence was estimated at 0.26%. HIV prevalence in males is 0.30% and females is 0.22%. In 2016, India had 80,000 new cases and 62,000 AIDS related deaths. In HIV patient the focus mostly falls on the white cell count especially the lymphocyte levels and CD4+ count. But it has been shown that cytopenias of all major cell lines exist in HIV patients. The incidence of various cytopenias correlate directly with the level of immunosuppression.

Isolated cytopenia, especially thrombocytopenia may even be the initial presentation of HIV.

Aims and Objectives

1. To analyse the hematological profile of HIV infected individuals irrespective of their ART status in our medical college hospital.
2. To analyse the association of CD4 count, WHO staging, cART intake independently with the hematological parameters

Inclusion Criteria

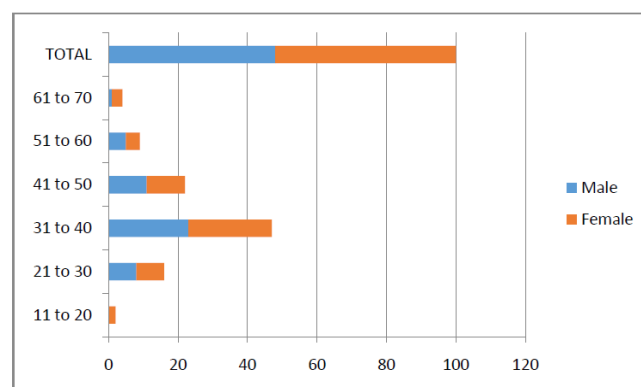
Patients attending the HART center attached to the hospital and those admitted without life-threatening infections.

Exclusion Criteria

1. HIV patients admitted with life-threatening conditions
2. Those known to have hematological diseases prior to the diagnosis of HIV.

Results

Age Group	Male	Female
11to20	0	2
21to30	8	8
31to40	23	24
41to50	11	11
51to60	5	4
61to70	1	3
TOTAL	48	52

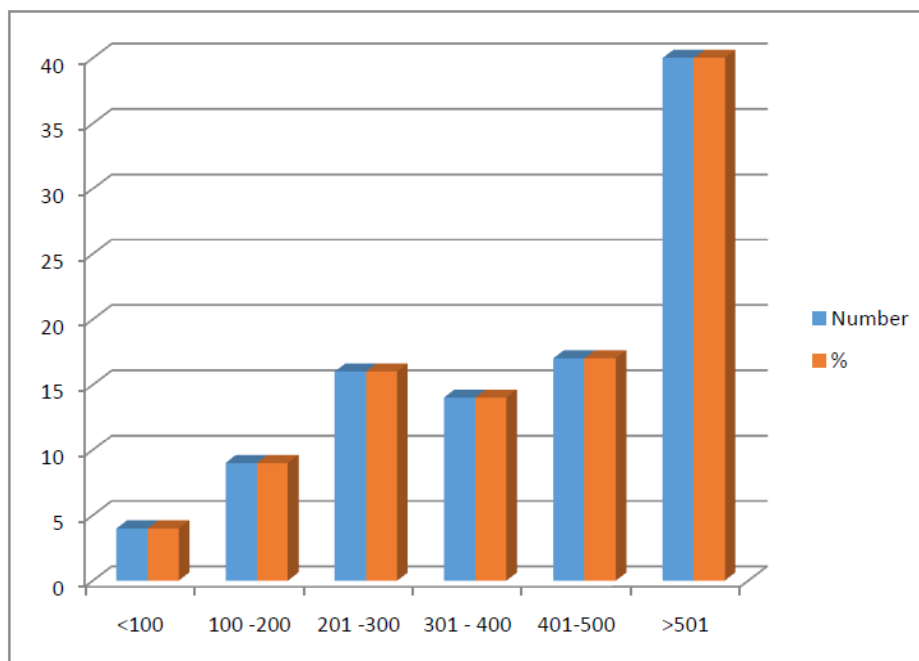


The haematological parameters between genders

	Mean M	Std. Deviation	Mean F	Std. Deviation	P value
HEMOGLOBIN	14.58	2.55	13.37	2.50	0.019
TOTAL_COUNT	6333.33	2018.77	6798.08	2716.65	0.337
POLYMORPHS	54.02	13.22	52.42	13.80	0.555
LYMPHOCYTES	31.71	12.37	36.36	12.77	0.068
MONOCYTES	12.85	6.60	10.03	5.28	0.020
PLATELET	2.65	1.15	2.67	1.37	0.925
RBC_COUNT	4.05	1.06	3.98	1.07	0.770
PCV	37.62	7.76	35.37	7.26	0.137
MCV	93.15	12.76	93.80	13.10	0.801
MCH	36.33	6.79	36.72	6.49	0.775
MCHC	37.93	3.54	37.80	4.11	0.852
CD4_COUNT	412.42	281.78	552.94	296.89	0.012

CD4 Distribution

CD4count	Number	%
<100	4	4
100-200	9	9
201-300	16	16
301- 400	14	14
401-500	17	17
>501	40	40

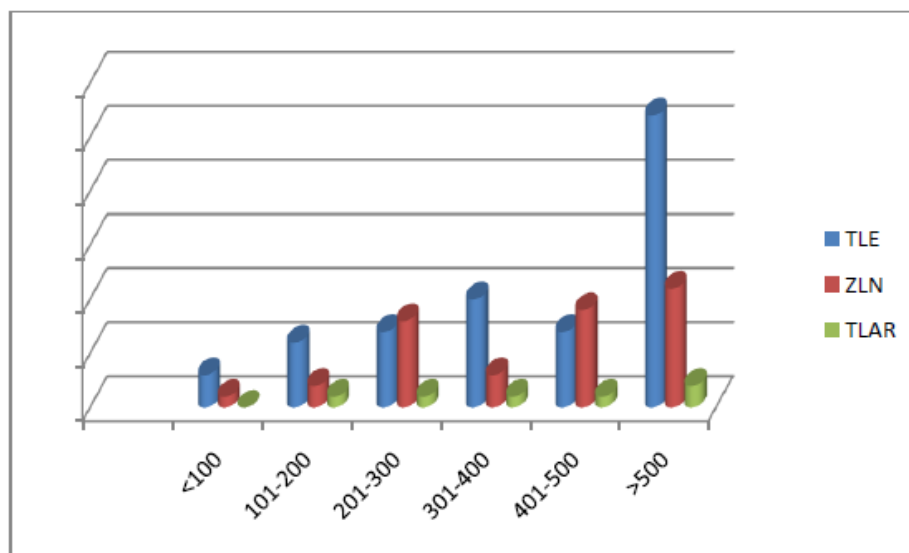


Various haematological parameters according to CD4 group

	CD4				T test PValue
	Lessthan500		More than 500		
	Mean	Std. Deviation	Mean	Std. Deviation	
HEMOGLOBIN	13.98	2.51	13.91	2.72	0.901
TOTAL_COUNT	5950.85	1927.95	7473.17	2746.27	0.002*
POLYMORPHS	56.52	13.74	48.40	11.67	0.003*
LYMPHOCYTES	30.89	13.05	38.79	10.78	0.002*
MONOCYTES	11.06	6.18	11.85	5.99	0.527
PLATELET	2.38	1.20	3.07	1.26	0.007*
RBC_COUNT	3.96	1.06	4.09	1.06	0.552
PCV	36.20	8.16	36.81	6.66	0.693
MCV	92.62	12.41	94.74	13.30	0.417
MCH	35.95	5.69	37.37	8.12	0.307
MCHC	37.81	3.47	37.95	3.68	0.845

*Statistically significant

ART Duration VS CD4 Count



CD4Count	TLE	ZLN	TLAR
<100	3	1	0
101-200	6	2	1
201-300	7	8	1
301-400	10	3	1
401-500	7	9	1
>500	27	11	2

Age distribution: most of the study subjects fell in an age group of 31 – 40 years both for male and female subjects. There is no statistical significance for age distribution as per the data obtained in this study.

Mean age of males was 37.98 ± 8.86

Mean age of females was 39.08 ± 10.63

With a p value of 0.647 which is not significant.

As per data released by Tamil Nadu State AIDS Control Society (TNSACS), ABOUT 50% of HIV infected patients belong to 30 to 49 years age group at the time of diagnosis.

Duration Of Infection: mean duration of infection among males was 2121 days and females 2366 days.

Duration of Treatment: Mean duration of ART among males was 1692 days and females was 1907 days.

There is no significance in these values as per the Mann Whitney Test. (p values is 0.460 and 0.401)

Gender wise ART regimen

Zidovudine, Lamivudine and Nevirapine (ZLN) was the most followed regimen among males (45%) while most of the female cases (52%) were on Tenofovir, Lamivudine, Efavirenz regimen (TLE). All patient were on Lamivudine.

Symptomatology: most common symptom reported among the study population was fatigue followed by breathlessness.

Comparative Analysis of hematological parameters between male and female subjects:

Mean hemoglobin value was 14.58 for males and 13.37 for females with a P value of 0.019. it may not be significant as females have a low hemoglobin value compared to males in normal population.

Mean total count was 6333 and 6798 respectively in males or females. Total polymorphs among males and females were 54 and 52 respectively.

Lymphocyte count was 31.7 among males and 36 among females.

Monocyte count was 12.85 and 10.02 among males and females respectively.

Platelet count mean values were 2.65 L/mm^3

in males and 2.67 L/mm^3 In females

RBC, PCV, MCV, MCH, MCHC values were comparable in males and females.

Mean CD4+ count in males were 412, while in females was 552.94 (>500) which has a p value of 0.012 and is statistically significant.

CD4+ Distribution

Fortunately 40% of patients had CD4+ counts > 500 indicating that outpatients registered here are having a measurably good immune status possibly due to better awareness about the disease and greater compliance to treatment. Thus most of the subjects were relatively symptom free. Only about 4% of the total subjects studied had CD4+ count less than 100.

35% males had than 500 CD4+ count (73%) while only 24 females (46%) had a count of less than 500.

The fall in CD4+ count were faster in males compared to females (p value 0.005)

Relationship of CD4+ count with various hematological parameters:

Each of the hematological parameters were studied in subjects with CD4+ counts of less than 500 and more than 500. Total count, polymorph levels, lymphocytes and platelet counts showed a statistically significant relationship with the CD4+ count. These were directly proportional. A low CD4+ was directly correlating with a low value of each of these parameters. However, such a significant association was not seen with respect to the hemoglobin values and CD4+ of the given subjects.

Parameter like RBC count, PCV, MCH and MCHC showed no significant variance among the two groups.

On the other hand, MCV values were found to be increased above its upper limit of normal, in patients with CD4+ > 500.

Platelet and CD4+

Out of the 100 subjects studied, 19% of subjects had platelet count of < 1.5 lakh, 9% of whom had platelet of less than 1 lakh. 16 out of 19 patients

had CD4+ count of < 500, indicating a strong relationship between low CD4+ count and low platelet in the study population.

Total Count and CD4+ count

Total count when grouped into three categories of <4000, 4000- 10000, > 10000 did not show a statistically significant between CD4+ count above and below the 500 cutoff. (p = 0.8) (Pearson Chi-square = 4.569)

Monocyte counts

Interestingly, the monocyte counts showed a clear inverse relation to its CD4+ counterpart. Counts were significantly low in most females with CD4+ of more than 500.

Breathlessness was the most prevalent symptom among the few symptomatic subjects of the study group. But this symptom showed no positive correlation with the subjects platelet levels or CD4+ count or any other parameter.

ART Duration and CD4+ Count

Increased ART duration is associated with CD4+ count of more than 500. CD4+ of more than 500 is seen with all regimens. Overall female patients seem to be sustaining CD4+ count better than males in the study. There is a positive correlation between MCV, CD4+ count and ART duration.

Conclusion

Our study included 100 relatively asymptomatic PLWHA on regular ART, attending the outpatient department of ART clinic .

We concluded that:

- 1) Females are more compliant to treatment and follow up compared to the age matched male counterparts
- 2) There was significant correlation between low CD4+ counts and low platelet counts.
- 3) Females patients were sustaining their CD4+ counts compared to males probably due to better drug compliance.

- 4) There is a positive correlation between raised MCV values, increased CD4+ count and longer duration of ART therapy.
- 5) Mean duration of ART was 5-6 years, indicating that awareness and compliance among patient attending the ART clinic is good.

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