

## Vaccines-2014 : Absolute lymphocyte count: A probable substitute marker for CD4 count in HIV-infected patients in economically restrained countries - Ruchee Khanna - Kasturba Medical Hospital

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### Background:

the initiation of HAART (Highly Active Anti-Retroviral Therapy) and prophylaxis against opportunistic infections in HIV infection. The utility of Absolute Lymphocyte Count (ALC) in lieu of CD4 count in such patients has been a long-standing topic of debate, especially in resource-constrained settings.

### Aim:

To find the relationship between CD4 count and Absolute Lymphocyte Count (ALC) and interpret the clinical utility of ALC as a surrogate marker for CD4 count.

### Materials & Methods:

A total of 455 EDTA blood samples from HIV-infected patients were analyzed for their ALC and CD4 counts, over a period of 6 months from January 2015 to June 2015 in Clinical Laboratory, Kasturba Hospital, Manipal. Correlation analysis between ALC and CD4 count and receiver operating characteristic (ROC) analysis at CD4 count  $\leq 200/\mu\text{L}$  and CD4 count  $\leq 350/\mu\text{L}$  were conducted as proposed by WHO guidelines.

### Results:

The male to female ratio among our subjects was 2:1 and their age ranged from 11 to 78 years. The median ALC was  $1600/\mu\text{L}$  and the median CD4 count was  $258.58/\mu\text{L}$ . A strong positive correlation (Pearson coefficient,  $r=0.741$ ) was obtained between CD4 count and ALC. Areas under the ROC curve for ALC and CD4 count  $\leq 200/\mu\text{L}$  and CD4 count  $\leq 350/\mu\text{L}$  were 0.901 (95% CI, 0.872-0.929) and 0.911 (95% CI, 0.885-0.937), respectively, both of which showed an excellent correlation. Also, from the ROC analysis, the ALC cut off at CD4 count  $\leq 200/\mu\text{L}$  (Sensitivity-83.87%, specificity-81.41%, PPV-75.73%, NPV87.95%) and CD4 count  $\leq 350/\mu\text{L}$  (Sensitivity-80.22%, specificity-86.44%, PPV-90.28%, NPV-73.56%) was determined to be  $\leq 1450/\mu\text{L}$  and  $\leq 1650/\mu\text{L}$ , respectively.

### Conclusion:

CD4 count is the primary clinical parameter used for ALC was found to have a strong correlation with CD4 count and the ALC cut offs corresponding to CD4 counts  $\leq 200/\mu\text{L}$  and CD4 count  $\leq 350/\mu\text{L}$  was found to be  $\leq 1450/\mu\text{L}$  and  $\leq 1650/\mu\text{L}$ , respectively. Hence, ALC can be considered as a clinically plausible substitute marker for CD4 count. A lymphocyte is one of the subtypes of a white platelet in a vertebrate's safe framework. Lymphocytes incorporate characteristic executioner cells (which work in cell-intervened, cytotoxic intrinsic invulnerability), T cells (for cell-interceded, cytotoxic versatile insusceptibility), and B cells (for humoral, counter acting agent driven versatile resistance). They are the fundamental kind of cell found in lymph, which incited the name "lymphocyte". White blood cells (thymus cells) and B cells (bone marrow-or bursa-inferred cells[a]) are the major cell parts of the versatile insusceptible reaction. White blood cells are associated with cell-intervened insusceptibility, while B cells are basically liable for humoral resistance (identifying with antibodies). The capacity of T cells and B cells is to perceive explicit "non-self" antigens, during a procedure known as antigen introduction. When they have recognized an intruder, the cells produce explicit reactions that are custom fitted maximally to dispense with explicit pathogens or pathogen-contaminated cells. B cells react to pathogens by delivering huge amounts of antibodies which at that point kill remote items like microorganisms and infections. In light of pathogens some T cells, called T aide cells, produce cytokines that direct the invulnerable reaction, while other T cells, called cytotoxic T cells, produce harmful granules that contain ground-breaking proteins which actuate the demise of pathogen-contaminated cells. Following initiation, B cells and T cells leave an enduring heritage of the antigens they have experienced, as memory cells. All through the lifetime of a creature, these memory cells will "recall" every particular pathogen experienced, and can mount a solid and quick reaction if a similar pathogen is identified once more; this is known as obtained insusceptibility. Mammalian undifferentiated organisms separate into a few sorts of platelet inside the bone marrow.[3] This procedure is called haematopoiesis. All

lymphocytes start, during this procedure, from a typical lymphoid ancestor before separating into their particular lymphocyte types. The separation of lymphocytes follows different pathways in a progressive design just as in an increasingly plastic manner. The development of lymphocytes is known as lymphopoiesis. In well evolved creatures, B cells develop in the bone marrow, which is at the center of most bones. In winged animals, B cells develop in the bursa of Fabricius, a lymphoid organ where they were first found by Chang and Glick, (B for bursa) and not from bone marrow as normally accepted. Immune system microorganisms relocate to and develop in a particular organ, called the thymus. Following development, the lymphocytes enter the dissemination and fringe lymphoid organs (for example the spleen and lymph hubs) where they overview for attacking pathogens as well as tumor cells. The lymphocytes associated with versatile insusceptibility (for example B and T cells) separate further after introduction to an antigen; they structure effector and memory lymphocytes. Effector lymphocytes capacity to take out the antigen, either by discharging antibodies (on account of B cells), cytotoxic granules (cytotoxic T cells) or by motioning to different cells of the resistant framework (aide T cells). Memory T cells stay in the

fringe tissues and course for an all-inclusive time prepared to react to a similar antigen upon future introduction; they live a long time to quite a long while, which is for quite some time contrasted with different leukocytes. The human immunodeficiency infections (HIV) are two types of Lentivirus (a subgroup of retrovirus) that contaminate people. Over the long haul, they cause AIDS (AIDS), a condition where dynamic disappointment of the resistant framework permits dangerous crafty contaminations and malignant growths to thrive. Without treatment, normal endurance time after disease with HIV is evaluated to be 9 to 11 years, contingent upon the HIV subtype. In many cases, HIV is an explicitly transmitted contamination.

#### **Biography**

Ruchee Khanna has completed her MBBS and MD Pathology from Saurashtra University, India. She is presently working as an Associate Professor in Department of Pathology, Kasturba Medical College, India. She has published 15 papers in indexed international journals.

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