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HIV Disease Management in the Highly Active Antiretroviral Therapy (HAART) Era

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Human Immunodeficiency Virus (HIV) infection, with the complexity of disease and its progression has become a challenge to human beings. A UNAIDS global estimate reveals that currently 33.2 million people are living with HIV infection world wide [1]. HIV infection leads to variable disease course in different people, amongst them are long term non-progressors, who survive for more than 10 years after getting infected. The biological basis of this variability in the disease progression is still unknown. Due to the chronicity of the disease and the extent of morbidity it causes, management of such individuals has become a challenge for physicians treating HIV infected patients. To effectively monitor the disease progression and the response to Highly active Antiretroviral Therapy (HAART) in the poor, developing and economically weak third world countries that carry most of the burden of HIV seropositive patients, it becomes financially overburdened to acquire resources and infrastructure necessary for patient management. Monitoring the disease progression and the response to Highly Active Antiretroviral Therapy (HAART) is traditionally carried out using TCD4+ cell counts and HIV/RNA viral load [2].

Many clinical and laboratory markers have been used to estimate disease progression in HIV1 infection. Markers of AIDS development include viral markers (plasma HIV RNA load, serum p24 Ag, serum anti p24 antibodies), Surrogate markers (antibodies against p17, gp 120, gp 41 and nef gene product) and nonspecific markers including CD4+ T-cell counts, CD8+ T-cell counts and Delayed Type Hypersensitivity test (DTH) [3,4]. Other Alternate markers include elevated serum β2 microglobulin, neopterin (D-erythro-1,2,3- trihydroprpylptrin), Dehydroepiandrosterone (DHEAS), serum cortisol and many others including CRP,ESR, serum albumin, Tumor Necrosis Factor (TNF), Interferon-γ, Interleukin-2 (IL-2), IL-4. Biochemical parameters including Serum Albumin, Globulin, Serum Glutamate Oxaloacetae Transaminase (SGOT), Total protein, Total cholesterol, High density Lipoproteins (HDL), Low density Lipoprotein(LDL), Lactate Dehydrogenase (LDH) and Creatine Kinase (CK/MB) [5,6] were also evaluated by some studies as useful markers to assess the disease progression and treatment response.

Studies conducted in the past have demonstrated the role of HIV infection by itself irrespective of HAART therapy can result in the development of metabolic disorders including altered lipid metabolism. Previous reports have also suggested the association of cardiovascular disease (CAD), acute cardiovascular events, and HAART therapy [7]. TCD4+ cell counts have been proved an incomplete marker after initiation of anti retroviral therapy in assessing the disease progression and treatment response [8]. Considering the above said factors research is now being conducted to find some cost effective, easily performed and freely available surrogate or alternate markers that can help in assessing the HIV disease progression. With the advent of Highly Active Antiretroviral Therapy (HAART), the quality of life of HIV seropositive patients improved to a greater extent, simultaneously their morbidity and mortality has reduced significantly. The fact that it is the poor, developing and economically weak third world countries that carry most of the burden of HIV seropositive patients, it becomes financially overburdened to acquire resources and infrastructure necessary for patient management. Considering the above said factors research is now being conducted to find some cost effective, easily performed and freely available surrogate or alternate markers that can help in assessing the HIV disease progression. Conversely previous research reports have pointed out the effects of ART on the patients as well as stressed the need to evaluate various hematological parameters before initiating HAART therapy [9,10]. Studies conducted in the past have also demonstrated the role of HIV infection by itself irrespective of HAART therapy can result in the development of metabolic disorders including altered lipid metabolism [5,6]. Previous reports have also suggested the association of cardiovascular disease (CAD) and HAART therapy [11,12]. Studies have suggested that HIV influences inflammatory processes independent of CD4+Tcell counts and that the viral proteins including the Tat and Nef, may influence the monocyte functions i.e cytokine and chemokine production and their survival [13,14]. Furthermore few studies have emphasized oxidative stress as a principal mechanism in both the HIV replication and AIDS development [15].

We should impress on the need for further studies on usefulness of surrogate and other alternate markers of HIV disease progression both before and during antiretroviral therapy. The knowledge of HIV infection has expanded tremendously that led to significant improvement in the treatment, leading to decrease in morbidity and mortality. Unfortunately the progress achieved in the development of treatment and vaccine has been restricted or confined to western world. Disease progression, initiation and assessment of antiretroviral therapy in HIV infected individuals depend on CD4+Tcell counts and HIV RNA viral load. However due to the limitations either in the scientific technology and infrastructure or with the finances, many developing and poor countries cannot afford the cost of these tests. Therefore, research should concentrate on finding alternate and cost effective markers which can help physicians in deciding the start of antiretroviral therapy and predicting HIV disease progression. HIV clinics should come up in the peripherals and the physicians treating the HIV patients should be involved in the management of such patients making use of the cheaper alternate markers. Further studies should be encouraged to

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evaluate HIV-infected patients for various biological markers choose from them a set of markers that can effectively evaluate the disease state and probable time due for progression to AIDS and formulate effective intervention strategies in the management of HIV disease.

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