
TCD4+ Lymphocyte are related to muscle strength parameters in HIV-1 positive adolescents: a preliminary study

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ABSTRACT

Introduction: Catabolism of muscle and loss of function are complications that can occur during the course of HIV infection, and are commonly seen in a majority of adolescents with vertically transmitted Human Immunodeficiency Virus-type 1 (HIV-1). The levels of CD4+ and CD8+ lymphocytes, reference markers for the treatment of vertically transmitted HIV-1, also decline as the disease progresses. Alterations on these reference markers may be associated with neuromuscular force parameters in sedentary adolescents that have potential as prognostic indicators for treatment administration. Objective: To investigate the relationship between maximal isometric muscular contraction force and levels of CD4+ and CD8+ lymphocytes in sedentary, vertically transmitted HIV-1 positive adolescents. Methods: The sample consisted of twenty individuals, adolescents (N= 9 males, 11 females, age 15-17 years), vertically transmitted HIV-1 patients from Institute of Infectious Diseases Emilio Ribas in São Paulo, Brazil, who were undergoing HAART therapy randomly selected to participate in the study. The number of CD4+ and CD8+ cells was determined by flow cytometry using BD FACS Calibur Multitest Equipment, and Multiset-BD software. Viral load was determined using b-DNA methodology, on Siemens System Versatil 440 equipment. All analyses followed standard procedures approved by the Brazilian Ministry of Health. Muscular strength measurements were completed in the morning after blood collection and weight and height measurements. Prior to starting, patients were familiarized with all testing procedures and strength exercises that were used for testing. After the warm up, maximum voluntary isometric muscular strength of the elbow flexors and knee extensors were assessed using an electric dynamometer (EMG210C, EMGLAB System of Brazil). Each patient made three attempts with a rest interval of two minutes between trials. The highest isometric force and torque value were recorded and used for analyses. Results: Upper body force ($r=0.70$, $p=0.001$) and maximal torque ($r=0.69$, $p=0.001$) were significant correlated with CD4+ count. Similar observations between CD4+ count and lower body muscular force ($r=0.62$, $p=0.005$) and maximum torque ($r=0.61$, $p=0.007$) were also observed. CD8+ was not associated with any strength measures. Conclusion: CD4+ lymphocytes showed a strong correlation with force parameters in sedentary HIV-1 positive adolescents. Given that those individuals with higher TCD4+ counts showed a tendency towards manifesting higher muscle strength, this may be used as a predictor to indicate the level of physical capacity of patients and consequently help optimize treatment. Further research is needed to explore the potential prognostic value of muscle strength parameters in HIV-1 positive adolescents.

