Modelling In Vivo HIV Dynamics under Combined Antiretroviral Treatment

Abstract

In this paper a within host mathematical model for Human Immunodeficiency Virus (HIV) transmission incorporating treatment is formulated. The model takes into account the efficacy of combined antiretroviral treatment on viral growth and T cell population in the human blood. The existence of an infection free and positive endemic equilibrium is established. The basic reproduction number is derived using the method of next generation matrix. We perform local and global stability analysis of the equilibria points and show that if , then the infection free equilibrium is globally asymptotically stable and theoretically the virus is cleared and the disease dies out and if , then the endemic equilibrium is globally asymptotically stable implying that the virus persists within the host. Numerical simulations are carried out to investigate the effect of treatment on the within host infection dynamics.

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