

عنوان مقاله:

Numerical Simulation of Mass Transfer in Pulsatile Flow of Blood Characterized by Carreau Model under Stenotic Condition

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خلاصه مقاله:

The present numerical study deals with a mathematical model representing mass transfer in blood flow under stenotic condition. Streaming blood is considered as a non-Newtonian fluid characterized by Carreau fluid model and the vessel wall is taken to be flexible. The nonlinear pulsatile flow phenomenon is governed by the Navier-Stokes equations together with the continuity equation while that of mass transfer is governed by the convection-diffusion equation coupled with the velocity field. A finite difference scheme is developed to solve these equations accompanied by suitable initial and boundary conditions. Results obtained are examined for numerical stability up to wanted degree of correctness. Various significant hemodynamic parameters are examined for additional qualitative insight of the flow-field and concentration-field over the entire arterial segment with the help of the obtained numerical results. Comparisons are made with the available results in open literature and good agreement has been achieved between these two results. Comparisons have been made to understand the effects of viscosity models for Newtonian and non-Newtonian fluids and also for rigid and flexible arteries.

کلمات کلیدی:

Carreau fluid model, Newtonian fluid, Non, Mass transfer, Pulsatile flow, Flexible artery

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