Computational simulation of flow in stenotic artery using cubic interpolation profile scheme

Abstract

This paper devoted to a computational prediction of blood flow in a stenotic artery using a suitable mathematical model. The artery was modelled as a rigid two-dimensional tube with three different levels of severity of the disease. In the mathematical model, the blood flow equations were governed by the stream function-vorticity equations. Then the cubic interpolation profile scheme with high order of accuracy was applied to discretise the advection term of the equation. Different cases were considered, where the Reynolds number of the blood flow were varied to predict pulsatile of blood flow. The present paper reports the analysis of flow separation area downstream the stenosed artery and the location and peak wall shear stress values. These findings may contribute for early detection and medical treatments to prevent further development of the disease and rupture of the artery.