

ABSTRACT

A nonlinear two-dimensional micropolar fluid model for blood flow in a tapered artery with a single stenosis is considered. This model takes into account blood rheology in which blood consists of microelements suspended in plasma. The classical Navier–Stokes theory is inadequate to describe the microrotations or particles' spin of such suspension in a viscous medium. The governing equations involving unsteady nonlinear partial differential equations are solved using a finite difference scheme. A quantitative analysis performed through numerical computation shows that the axial velocity profile and the flow rate decrease and the wall shear stress increases once the artery is narrower in the presence of the polar effect. Furthermore, the taper angle certainly bears the potential to influence the velocity and the flow characteristics to considerable extent