COMPUTER SIMULATION OF BLOOD FLOW IN LARGE ARTERIES BY A FINITE ELEMENT METHOD

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ABSTRACT

Two-dimensional numerical simulations of blood flow are performed using the finite element method. This technique is carry out to investigate the influence of abnormal effects of artery geometry on the behavior of steady and laminar flow of an incompressible and Newtonian blood flow within a stenosed.

Blood **F**low **S**imulation (**BFS**) program using finite element method is written in Matlab. The BFS program have simple graphical user interface, it is easy to use and it has fully control for manipulating, visualization, and saving the results.

The stenoses severity intensifies the stretches the recirculation zones in the arterial flow. Shear stresses were estimated from velocity gradient for stenotic flow in arteries with 50% and 75% stenosis degrees. In the case of aneurysm model the Reynolds number changed in steps (216, 400, 800, and 1000). The velocity, pressure, and wall shear stress fields are visualized for a better interpreting and understanding of flow features.

The computation results, for the aneurismal and stenotic arteries are compared with other previous experimental results and gets a good agreement.

KEYWORDS: Computer, Numerical, Blood Flow Simulation, Element Method, Program