$$P_r = 0.5, L = 0.5, R = 0.5, \lambda = 0.5, K_r = 0.8, \alpha = 10^0, \omega = 0.5, h = 0.5, S = 1,$$
$$g = 9.8, \beta_T = \beta_C = 0.5, t = 1$$

Fig.4.16: *Concentration profile with variation of angle of Schmidt Number (Sc) for*

$$P_r = 0.5, L = 0.5, R = 0.5, \lambda = 0.5, K_r = 0.8, \alpha = 10^0, \omega = 0.5, h = 0.5, S = 1,$$
$$g = 9.8, \beta_T = \beta_C = 0.5, t = 1$$

4.4 **CONCENTRATION PROFILE**

For different values of the chemical reaction parameter and the Schmidt number, the concentration profile over the flow region is shown. For different values of the chemical reaction parameter, Fig.4.15 is obtained while keeping another parameter constant. The concentration profile decreases as the chemical reaction parameter is increased. The concentration is higher in the artery's center. It drops dramatically near the flow axis and gradually in the middle of the artery. Fig. 4.16 shows the results for a variety of Schmidt numbers while keeping the other parameters constant. The concentration profile improves as the Schmidt number is increased. In the stenosed region, the concentration profile changes dramatically

4.5 NORMAL VELOCITY

Figure 4.17 depicts the usual pace (Normal Velocity). It is calculated in relation to the decay parameter. It starts at level 1 at t=0 for any value of the decay parameter. It exhibits a declining trend with time (t), with an increasing decay value indicating a lower blood velocity profile. The normal speed reduces rapidly at first, then gradually diminishes. As the Schmidt number is increased, the concentration profile improves. The concentration profile changes dramatically in the stenosed region.

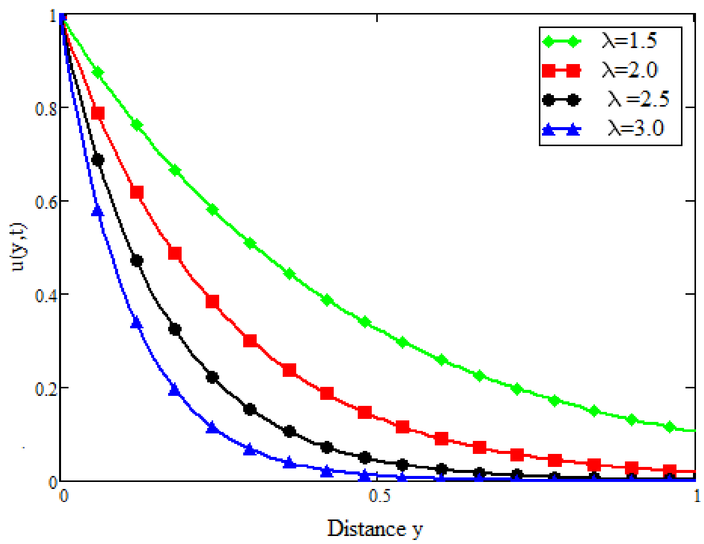

Fig.4.17: Normal Blood flow profile with variation of Deacay parameter(λ) for

$$P_r = 0.5, L = 0.5, S = 1, \lambda = 0.5, K_r = 0.8, K = 0.1, M = 0.5, \alpha = 10^0, h = 0.5, \omega = 0.5, Sc = 0.5,$$
$$g = 9.8, \beta_T = \beta_C = 0.5, t = 1$$

5.0 CONCLUSION

The impacts of thermal radiation, chemical reaction, and heat source on unsteady MHD blood flow via an artery with an angled magnetic field are investigated, as well as the effects of other factors:

- An increase in the magnetic field causes both blood flow and volumetric blood flow rate through the artery to decrease. This process can treat low blood pressure by raising blood pressure to return to normal. Sickle cell patients can also be treated by improving blood flow and maintaining oxygen in the hemoglobin as a result of increased blood flow when the magnetic field decreases. This can reduce strokes, swelling and pain when affected areas are exposed to the magnetic field at different tilt angles.

- As the intensity of the magnetic field parameter (M), thermal radiation (R), and chemical reaction parameters increases, the blood flow rate also decreases. If high blood pressure problems are detected early, the problem can be treated well with repeated and accurate clinical dosing.
- Increasing the thermal radiation parameter decreases blood flow while volumetric blood flow rate increases. This is due to the blood vessels narrowing (lesion), resulting in a reduction in blood flow through the vessels. This approach can also be used to treat tumors. Increased thermal radiation causes a decrease in blood temperature, which shrinks tumor growth in the area of exposure.
- Increasing the heat source increases blood flow, increases the volumetric flow rate of blood, and raises the temperature of blood. This can lead to cramps and sometimes death.
- An increase in permeability reduces both blood flow and volumetric blood flow, and an increase in the inclination angle of the magnetic field reduces blood flow near the arterial wall but decreases blood flow away from the wall.
- Decreases in normal speed significantly to reduce damping parameter.
- When the drug is delivered to the inflamed carotid artery, it becomes concentrated. reaction Drug concentration increases at high Schmidt numbers and decreases at high chemical parameters. The following are limits on the amount of drugs that are the subject of clinical research. It provides a mathematical analysis of multi-therapy assignments when approved by the medical community.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

[1] Kolin A. Electromagnetic flow meter: Principles of method and its application to blood flow measurement. In-Proceedings of the Society of Experimental Biology and Medicine. 1936;35:53-56.

[2] Korchevskii EM, Marochnik LS. Magneto hydrodynamic version of movement of blood. Biophysics. 1965;10(2):411-414.

[3] Ogulu A, Amos E. Modelling pulsatile blood flow within a homogeneous porous bed in the presence of a uniform magnetic field and time dependent suction. International Commun Heat Mass Transfer. 2007;34:989- 995.

[4] Muhammad Usman, Syed Tauseef, Mohyud Din. Fluid flow and heat transfer investigation of blood with nanoparticles through porous vessels in the presence of magnetic field. Journal of Algorithm & Computational Technology. 2008;13:1-15. DOI: 10.1177/1748301818788661.

[5] Asma Khalid, Llyas Khan, Arshad Khan, Sharidan Shafie, I. Tlili. Case study of MHD blood flow in a porous medium with CNTS and thermal analysis. Journal of Thermal Engineering. 2018;12:374- 380.

[6] Prakash Om, Singh SP, Devendra Kumar, Dwivedi YK. A study of effects of heat source on MHD blood flow through bifurcated arteries. AIP Advances I. 2011;042128. DOI: 10.1063/1.3658616.

[7] Tripathy DA. Mathematical model for blood flow through inclined arteries under the influence of inclined magnetic field. Journal of Medicine and Biology. 2012;12(31250033):1-16.

[8] Neetu Srivastava. Analysis of flow characteristics of the blood flowing through an inclined tapered porous artery with mild stenosis under the influence of an inclined magnetic field. Journal of Biophysics. 2014;9:797142.

[9] Tziirtzilakis EE. A mathematical model for blood flow in magnetic field. Physics of Fluid. 2005;17:077103.

[10] Blessy Thomas, Sumam KS. Blood flow in human arterial systems-A review. International Conference on Emerging Trend in Engineering Science and Technology. 2016;24:339- 346.
[11] Latha R, Rushi Kumar B. Unsteady MHD blood flow through porous medium in a parallel plate channel. IOP Conference Series: Material Science and Engineering. 2017;263:062020. DOI: 10.1088/1757899X/263/6/062020.
[12] Vincent Mwanthi, Eustance Mwenda, Kennedy Gachoka J. Velocity profiles of unsteady blood flow through an inclined circular tube with magnetic field. Journal of
[13] Islam M. Eldesoky. Mathematical analysis of unsteady MHD blood flow through parallel plate channel with heat source. World Journal of Mechanics. 2012;2:131-137. DOI: 10.4236/WJM.2012.23015.
[14] Omamoke E, Amos E, Jatari E. Impact of thermal radiation and heat source on MHD blood flow with an inclined magnetic field in Treating Tumor and Low Blood Pressure. Asian Res J Math 2020;16(9):77–87. http://dx.doi.org/10.9734/arjom/2020/v16i930221.
[15] Y. Granot Y, Rubinsky B. Mass transfer model for drug delivery in tissue cells with reversible electroporation. Int J Heat Mass Transfer 2008;51(23–24):5610–6. http://dx.doi.org/10.1016/j.ijheatmasstransfer.2008.04.041.

APPENDIX

$$B_1 = 1, \quad B_2 = \lambda^2 - M\cos^2\alpha + \frac{L}{K}, \quad B_3 = h\ell^{\lambda^2 t}, \quad B_4 = \sqrt{\frac{P_r L}{P_r + R}}$$

$$B_5 = \sqrt{\frac{P_r\lambda^2 + S}{P_r + R}}, \quad B_6 = \sqrt{(\lambda^2 - \omega)Sc}, \quad B_7 = B_8 = \frac{B_4^2 \pm \sqrt{(B_4^4 - 4B_5^2)}}{2}, \quad B_9 = \frac{1}{2\cosh B_7}$$

$$B_{10} = \frac{1}{2\sinh B_7}, \quad B_{11} = \frac{L \pm \sqrt{(L^2 - 4B_2)}}{2}, \quad B_{14} = \frac{B_3}{B_2}$$

$$B_{15} = B_{16} = \frac{1}{[(B_2 + B_7^2)^2 - L^2 B_7^2]}\left[\frac{g\beta_T (B_2 + B_7^2)}{2\sinh B_7} - \frac{g\beta_T L B_7}{2\cosh B_7}\right],$$

$$B_{17} = \frac{1}{[(B_2 - B_6^2)^2 + L^2 B_6^2]}\left[\frac{g\beta_T L B_6}{2\sin B_6} - \frac{g\beta_T (B_2 - B_6^2)}{2\cos B_6}\right],$$

$$B_{18} = \frac{1}{[(B_2 - B_6^2)^2 - L^2 B_6^2]}\left[\frac{g\beta_T L B_6}{2\sin B_6} - \frac{g\beta_T (B_2 - B_6^2)}{2\cos B_6}\right],$$

$$B_{12} = \frac{1 - [2B_{14} + 2B_{15}\cosh B_7 + 2B_{17}\cos B_6]}{2\cosh B_{11}},$$

$$B_{13} = -\left[\frac{1 + 2B_{16}\sinh B_7 + 2B_{18}\sin B_6]}{2\sinh B_{11}}\right]$$