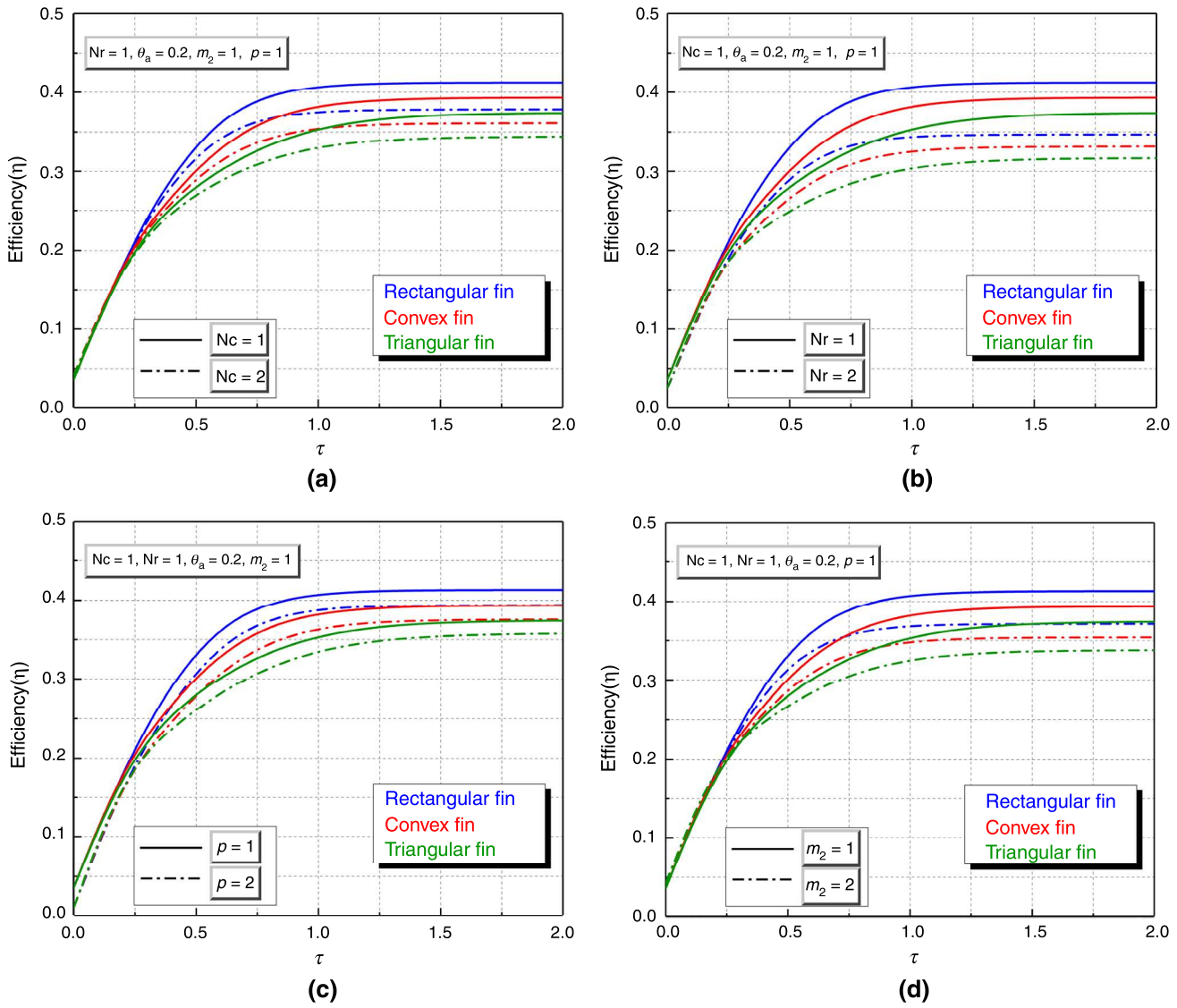

Fig. 11 Efficiency of fin versus dimensionless time for diverse values of **a** Nc, **b** Nr, **c** p, and **d** m_2

fin surface, which leads to the decrease in the ratio of actual heat transport to transfer of heat from the fin surface kept at base temperature. This result can be qualitatively compared with that of Torabi et al. [11].

The transient efficiency of fin of rectangular, convex and triangular profile for different values of Nc, Nr, p, m_2 is presented in Fig. 11a–d, respectively. Initially, when there is no heat flow from the base, the fin efficiency is zero and the surface of the fin is in thermal equilibrium with the surrounding but as the heat flow through the fin, the efficiency rises sharply and attains constant value as the steady state is reached. In the transient region, it is noticed that, as the dimensionless time rises, efficiency also enhances. Khan and Aziz [18] attained the same conclusion for unsteady convective fin case. It is observed that steady state is reached earlier for higher Nc, Nr, p, and m_2 and as these parameters rise, efficiency decreases. Additionally, it is observed that the efficiency of the rectangular fin is higher and the triangular fin is lower than the convex fin.

Conclusions

The transient thermal performance and efficiency of the longitudinal porous fin of different profiles like rectangular, triangular, and convex shapes under a fully wet circumstance has been scrutinized numerically. The main findings of the present investigation are listed below: