Microchannels are the current interest for use in compact heat exchanger , micro reactors , very large scale integrated system where there is a desire of high heat transfer performance. The mentioned electronic equipment are important part of modern life. The dissipation of heat from these equipment is very necessary for the proper functioning of these instruments. Microchannels provide high heat transfer coefficients because of their small hydraulic diameter. In this work, a numerical investigation of fluid flow and heat transfer in different shapes of microchannels have been presented, square notches with different number are added to the rectangular microchannel to create different shapes of MCHS. A three dimensional computational fluid dynamics were built using a commercial package FLUENT to investigate the conjugate fluid flow and heat transfer phenomena in aluminum-based rectangular microchannel heat sink. The MCHS performance is evaluated in terms of temperature profile , Nusselt number and friction factor. Water is used in the present study as the working fluid. The results show that the heat transfer rate and Nusselt number are increased for the shapes that have notches compared with the original channel as Reynolds number increase. The Results conducted from this study were compared with that published in the previous literature and there were a good agreement obtained.