The brain contains a mixed population of cell types such as glial cells and neurons both of which are interdependent and important. The present study is directed towards the role of stress protein-induced glial cell activation in the management of inflammation occurring due to aluminium induced neurotoxicity and further protective role of curcumin has been seen. Aluminium was administered by oral gavage at a dose level of 100 mg/Kg b.wt/day for a period of eight weeks. To elucidate the region specific response, study was carried out in three different regions of brain namely cerebral cortex, mid brain and cerebellum. Following aluminium exposure, peripheral markers of aluminium were altered which was also reflected in memory loss which shows established aluminium neurotoxicity. Further enhanced gene and protein expression of HSP70 in the glial fractions of the aluminium exposed animals was observed showing activation of microglial cells following aluminium exposure. Aluminium exposure resulted in a significant increase in the NF-κB and TNF-α expression which was significantly inhibited by co-administration of curcumin. This was further reflected in histopathological studies showing no evidence of inflammation in conjunctive group as compared to aluminium treatment. From the present study, it can be concluded that curcumin has a potential inflammatory action and can be exploited in other toxicological conditions also.