Neurotoxin 6OH-DA was injected into unilaterally into ventral tegmental area in the midbrain of SD rats. The rats were sacrificed on 1, 3, 7, 10, 14 days and one month postoperation. Glial fibrillary acidic protein (GFAP) immunohistochemical ABC method was used to check the injury in the rat mesencephalon. The changes of astrocytes were observed at various post-injury periods. It was found that, 1-3 days after operation, in the rat brain where the needle penetrated had many GFAP positive reaction, at its periphery reactive glial cells could be seen, with enlarged cell body and thickened processes. One week after operation, it could be seen that around the needle tract there were increased reactive glial cells. Blood vessels proliferated in the injured area. Glial cells around the blood vessels also showed reactive changes. In addition, some glial cells around the injured area had cell bodies enlarged, sending out long processes, transversely extended across the needle path and arranged in lines perpendicular to the needle path. Neurons of the injured area were reduced and even disappeared. 10-14 days after operation, reactive glial cells in the injured area further increased in number, cell bodies were enlarged and with may thickened processes. Glial cells were arranged perpendicular to the needle tract were all typical. Glial cells in the cerebral peduncle on the injured side were also larger than the contralateral side, and with thickened processes. 1 month post-operation, changes were similar to that of the 14 days post-operation, but the changes of glial cells in the transverse arrangement perpendicular to the needle tract were not as typical as that of the 2 week ones. In animals that used normal saline instead of neurotoxin injection, the cells in substantia nigra of mesencephalon had no change but the change of glial cells around the needle tract were similar to that of the neurotoxin group, but glial cells showed milder reaction. This investigation showed that in the process of developing degenerative change in the central nervous tissues, the astrocytes reactive changes reached the peak at 10-14 days, until after 2 weeks it gradually became stable. In this article mechanism of astrocyte changes was also discussed.