Cytotoxic Effect of Tumor Necrosis Factor to Experimental Cerebral Glioma
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Gliocytoma is kind of high mortality malignant tumor, until now there is no effective treatment. In this paper, we investigated the cytotoxic action of tumor necrosis factor (TNF) to intracerebrally transplanted gliocytoma. 24 nude mice of age 5-6 weeks were used in this experiment. An injection of SWO-37 glioma cells (67 generation) were made in the nude mice left temporal cortex, 10ml in volume (contained tumor cells 1 x 10^6). The animals were divided into three groups: control group, TNF group and TNF + interferon (IFN-R) group. TNF 5,000u and TNF + IFN (10,000u) were injected intraperitoneally 36 hour after the inoculation, once a day, continuously for 6 days. The survival time and transplant reaction were monitored. The animals were sacrificed on when they were nearly death. Brain sections were prepared for pathological examination. The results were as follows: All the nude mice tumor cell implantations were successful. The survival period of different groups with tumor were: control group: 14.875 ± 2.961 days, TNF group: 24.250 ± 2.535 days, TNF + IFN group: 27.875 ± 3.533 days. The tumor cell mitotic index was: control group: 16.0344 ± 1.3246, TNF group: 6.7538 ± 1.3256; TNF + IFN group: 5.3543 ± 0.9140. Tumor in the control group showed extensive infiltrated growth, tumor tissue could be seen to grow to brain ventricle or out of skull. In the two treatment groups, the growth of tumor was more localized, no growth was seen in the brain ventricle or outside of the skull. After TNF and TNF + IFN-r treatment, tumor cells degenerated, nucleus condensed and shrinked. Fragmentation of nucleus was obviously increased. In cytoplasm of tumor there was obvious degeneration and necrosis. The percentage of area of necrosis to total tumor area: TNF group: 25.23%, TNF + IFN-r group 31.42%, control group 9.064% (P<0.01). Also hemorrhage and blood thrombus could be seen. In the neurosis area and around the tumor there were multiple neutrophilic granulocytes and lymphocytes infiltration. In the two treatment groups, around the necrosis area of tumor matrix there were many small glial cells.

The above results indicated that TNF has obvious inhibitory and killing effect to the glioma cells. TNF combined with IFN-r treatment was better in effect. The mechanism of its effect possibly is related to the direct tumor cytotoxicity and immuno-regulation function of TNF and IFN-r.