The inhibiting effect of neural stem cells on proliferation and invasion of glioma cells.


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The invasive and infiltrative nature of tumor cells leads to the poor prognosis of glioma. Currently, novel therapeutic means to eliminate the tumor cells without damaging the normal brain tissue are still strongly demanded. Significant attentions had been paid to stem cell-based therapy and neural stem cell (NSC) had been considered as one of the efficient delivery vehicles for targeting therapeutic genes. However, whether the NSCs could directly affect glioma cells remains to be seen. In this study, both rat and human glioma cells (C6 and U251) were co-cultured with normal rat embryonic NSCs directly or in-directly. We found the survival, proliferation, invasion and migration of glioma cells were significantly inhibited, while the differentiation was not affected in the in vitro co-culture system. In nude mice, although no significant difference was observed in the tumor growth, survival status and time of tumor-bearing mice were significantly promoted when U251 cells were subcutaneously injected with NSCs. In coincidence with the suppression of glioma cell growth in vitro, expression of mutant p53 and phosphorylation of AKT, ERK1/2 decreased while the level of caspase-3 increased significantly. Our results suggested that normal NSCs could possess direct anti-glioma properties via inhibiting the glioma cell viability, proliferation, invasion and migration. It could be a very promising candidate for glioma treatment.

KEYWORDS: glioma; inhibiting effect; invasion; neural stem cells; proliferation

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