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Association of the presence of neurospheres with treatment response and survival rate of children with astrocytoma

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Background and Aim: Astrocytomas are the most common primary central nervous system (CNS) tumors in children being the leading cause of solid cancer related death in childhood. Neurospheres formation and the ability of tumor cells to proliferate in culture along with key factors such as age, location, histology and Ki67, p53, EGFR markers are deemed as powerful tools to predict the clinical outcome of patients with astrocytomas. In this study we associate the survival rate and the response to treatment according to the formation of self-renewable neurospheres in consecutive passages of cell cultures of patients with astrocytomas.

Results: Our results showed a current survival rate of 18 patients (75%) and 6 deaths with an overall survival rate at 24 months. Patients who had neurospheres in basal culture have 39.51% survival rate at 24 months compared to those without neurospheres in basal culture medium with 81.48% survival rate at 24 months. Of the six patients who have died, four had neurospheres both in the basal culture medium and in the first passage. Regarding treatment response at six months, four out of five patients with progressive disease had neurospheres both in the basal culture medium and in the first passage, three of these patients had neurospheres in the second passage and two in the third passage. Instead of seven patients with complete response at six months, only one patient had neurospheres both in the basal culture medium and in the first passage.

Conclusion: We found a clear association between the development of neurospheres and the evolution of our patients.

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