Hormonal effects on glioblastoma multiforme in the nude rat model.

Plunkett RJ, Lis A, Barone TA, Fronckowiak MD, Greenberg SJ.

Department of Neurosurgery, State University of New York at Buffalo, Veterans Administration Medical Center, and Roswell Park Cancer Institute, 14203, USA. rjp@pce.net

OBJECT: The authors studied the effect of gender and hormonal status on survival in nude rats implanted with human glioblastoma multiforme (GBM) cell lines. METHODS: Nude rats received intracerebral implants of either wild-type U87MG cells or U87MG cells transfected with the gene for endothelin-1 (U87/ET-1). In the initial study, survival was compared in males and females for each of the two cell lines. The six second-phase study groups were composed of: 1) males; 2) females; 3) ovariectomized females; 4) sham ovariectomized females; 5) ovariectomized rats given 10 microg/day estradiol benzoate for 21 days; and 6) ovariectomized rats given 20 mg/kg/day progesterone for 21 days. All rats in the second phase were implanted with U87/ET-1 cells. Animals were killed when they exhibited initial signs of neurological deterioration. Female nude rats survived longer than male rats implanted with either U87 or U87/ET-1 cells. In the second phase, ovariectomized, male, and progesterone-treated rats died at approximately 19 days, whereas the female, sham-treated, and estrogen-treated animals died 23 to 25 days after tumor cell implantation. CONCLUSIONS: The authors demonstrate that female nude rats implanted with human GBM cells have a survival advantage over male rats and that estrogen provides the advantage.

PMID: 10350254 [PubMed - indexed for MEDLINE]