

Pre-radiation lymphocyte harvesting and post-radiation reinfusion in patients with newly diagnosed high grade gliomas

In people diagnosed with malignant brain tumors, the prescribed treatment is often radiation and chemotherapy; however, these treatments severely affect the immune system, increasing the chance of early death. Radiation in particular has been known to cause damage to lymphocytes (one of the subtypes of white blood cell), a condition known as lymphopenia. This study was designed to explore the possibility of restoring lymphocyte levels in such patients. Those patients eligible for the study were newly diagnosed and received radiation and chemotherapy, followed by six weeks of standard chemotherapy, with no past history of anti-tumor treatments of any kind. They were above 18 years old with an average age of 55.5 years. Lymphocytes were taken from these patients 1-10 days before receiving radiation treatment, and were then re-infused days after radiation.

The results of this study show that the technique of reinfusion may partially help patients recover their falling lymphocyte levels. As seen in past studies, patients' lymphocytes fell to low levels 8 weeks past beginning of radiation and chemotherapy, but after re-infusion of lymphocytes, with seven of eight patients showed an increase of at least 300 cells/mm³ after 14 weeks. Four of these patients maintained this increase at the end of the study of 20 weeks.

Then we compared our results with a control group. The control group had 23 patients with similar age, treatment, and blood cell levels, but those patients had not received any lymphocyte infusion. When compared to the control patients, it appeared that the changes due to re-infusion of lymphocytes might be too small to be significant. In addition, specific lymphocytes crucial to the immune defense were not restored with the infusion. This suggests that while it is possible to harvest and re-infuse lymphocytes in patients with malignant brain tumors, there are few significant improvements of recovery. At this time, it would be useful to conduct further studies to explore the viability of this therapy. Meanwhile, different approach such as a lymphocyte growth factor, interleukin-7, could be studied in these patients to increase the number of lymphocytes and improve their immune function.

Publication

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