## Low-Grade Glioma Radiotherapy Dose

Adjuvant radiation is often used in patients with low-grade gliomas with high-risk characteristics with a recommended dose of 45-54 Gy. Byrne et al. used the National Cancer Database (NCDB) to see which doses were being used and if any difference was seen in outcome.

They queried the NCDB for patients with WHO Grade 2 primary brain tumors treated with surgery and adjuvant radiotherapy. We divided the cohort into dose groups: 45-50 Gy, 50.4-54 Gy, and > 54 Gy. Multivariable logistic regression was used to identify predictors of low and high-dose radiation. Propensity matching was used to account for indication bias.

Results: We identified 1437 patients meeting inclusion criteria. The median age was 45 years and 62% of patients were > 40 years old. Nearly half of patients (48%) had astrocytoma subtype and 70% had a subtotal resection. The majority of patients (69%) were treated to doses between 50.4 and 54 Gy. Predictors of high dose radiation (> 54 Gy) were increased income, astrocytoma subtype, chemotherapy receipt, and treatment in a later years (2014). The main predictors of survival were age > 40, astrocytoma subtype, and insurance type. Patients treated to a dose of > 54 Gy had a median survival of 73.5 months and was not reached in those treated to a lower dose (p = 0.0041).

This analysis showed that 50.4-54 Gy is the most widely used radiation regimen for the adjuvant treatment of low-grade gliomas. There appeared to be no benefit to higher doses, although unreported factors may impact the interpretation of the results  $^{1)}$ .

Postoperative policies of "wait-and-see" and radiotherapy for low-grade glioma are poorly defined. A trial in the mid 1980s established the radiation dose.

A phase III prospective randomized trial of low- versus high-dose radiation therapy for adults with supratentorial low-grade astrocytoma, oligodendroglioma, and oligoastrocytoma found somewhat lower survival and slightly higher incidence of radiation necrosis in the high-dose RT arm. The most important prognostic factors for survival are histologic subtype, tumor size, and age<sup>2)</sup>.

Two prospective trials found no difference in OS or PFS between different XRT doses (EORTC trial  $^{3}$ ): 45 Gy in 5 weeks vs. 59.4 Gy in 6.6 weeks; Intergroup study  $^{4}$  50.4 vs. 64.8 Gy).

1)

Byrne E, Abel S, Yu A, Shepard M, Karlovits SM, Wegner RE. Trends in radiation dose for low-grade gliomas across the United States. J Neurooncol. 2022 Feb 23. doi: 10.1007/s11060-022-03962-4. Epub ahead of print. PMID: 35199246.

2)

Shaw E, Arusell R, Scheithauer B, O'Fallon J, O'Neill B, Dinapoli R, Nelson D, Earle J, Jones C, Cascino T, Nichols D, Ivnik R, Hellman R, Curran W, Abrams R. Prospective randomized trial of low- versus highdose radiation therapy in adults with supratentorial low-grade glioma: initial report of a North Central Cancer Treatment Group/Radiation Therapy Oncology Group/Eastern Cooperative Oncology Group study. J Clin Oncol. 2002 May 1;20(9):2267-76. PubMed PMID: 11980997.

## 3)

Karim ABMF, Maat B, Hatlevoll R, et al. A random- ized trial on dose-response in radiation therapy of low-grade cerebral glioma: European Organization for Research and Treatment of Cancer (EORTC) Study 22844. Int J Radiation Oncology Biol Phys. 1996; 36:549–556

Shaw E, Arusell R, Scheithauer B, O'Fallon J, O'Neill B, Dinapoli R, Nelson D, Earle J, Jones C, Cascino T, Nichols D, Ivnik R, Hellman R, Curran W, Abrams R. Prospective randomized trial of low- versus highdose radiation therapy in adults with supra- tentorial low-grade glioma: initial report of a North Central Cancer Treatment Group/Radiation Therapy Oncology Group/Eastern Cooperative Oncology Group study. J Clin Oncol. 2002; 20:2267–2276

From: https://neurosurgerywiki.com/wiki/ - **Neurosurgery Wiki** 

Permanent link: https://neurosurgerywiki.com/wiki/doku.php?id=low-grade\_glioma\_radiotherapy\_dose

Last update: 2024/06/07 02:56