The role of adjuvant chemotherapy in patients with H3K27 altered diffuse midline gliomas: a multicentric retrospective study

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Aims and scope

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Abstract

Purpose

Adult Diffuse midline glioma (DMG) is a very rare disease. DMGs are currently treated with radiotherapy and chemotherapy even if only a few retrospective studies assessed the impact on overall survival (OS) of these approaches.

Methods

We carried out an Italian multicentric retrospective study of adult patients with H3K27-altered DMG to assess the effective role of systemic therapy in the treatment landscape of this rare tumor type.

Results

We evaluated 49 patients from 6 Institutions. The median age was 37.3 years (range 20.1–68.3). Most patients received biopsy as primary approach ($n = 30$, 61.2%) and radiation therapy after surgery ($n = 39$, 79.6%). 25 (51.0%) of patients received concurrent chemotherapy and 26 (53.1%) patients received adjuvant temozolomide. In univariate analysis, concurrent chemotherapy did not result in OS improvement while adjuvant temozolomide was associated with longer OS (21.2 vs. 9.0 months, HR 0.14, 0.05–0.41, $p < 0.001$). Multivariate analysis

confirmed the role of adjuvant chemotherapy (HR 0.1, 95%CI: 0.03–0.34, $p = 0.003$). In patients who progressed after radiation and/or chemotherapy the administration of a second-line systemic treatment had a significantly favorable impact on survival (8.0 vs. 3.2 months, HR 0.2, 95%CI 0.1–0.65, $p = 0.004$).

Conclusion

In our series, adjuvant treatment after radiotherapy can be useful in improving OS of patients with H3K27-altered DMG. When feasible another systemic treatment after treatment progression could be proposed.

Data availability

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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Contributions

Conceptualization: VDN, EF, and AT contributed to conceptualization. Data Curation: VDN performed formal analysis and data curation. The Investigation was carried out by all authors. VDN, GL, AS, MS, GM, AM, VDR, MC,

MP, MP, MM, MC, GS, AB, MF, BP, MA, ADM, SA, DDB, AT, AD, EF reviewed methodology VDN, EF written the first version. All authors reviewed and edited this paper. All authors read and approved the final version of this manuscript. Vincenzo Di Nunno and Giuseppe Lombardi are co-first authors of the present manuscript. Antonio Silvani and Enrico Franceschi are co-last authors of the present manuscript.

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Ethics declarations

Competing interests

The authors declare no competing interests.

Ethics approval

The study was approved by the Ethical Committee of Azienda Sanitaria Locale di Bologna (protocol number CE09113, Bologna, Italy). All information regarding the human material was managed using anonymous numerical codes, and all samples were handled in compliance with the Helsinki Declaration.

Additional information

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Antonio Silvani and Enrico Franceschi are Co-last Authors.

Electronic supplementary material

Below is the link to the electronic supplementary material.

Supplementary Material 1

Supplementary Material 2

Supplementary Material 3

Supplementary Material 4

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