A shift has occurred from chemotherapy for recurrent disease toward the use of adjuvant treatment for newly diagnosed tumors. In addition, there is a better understanding of molecular factors that predict responsiveness to adjuvant chemotherapy.

Chemoradiotherapy with temozolomide is currently the standard of care for newly diagnosed glioblastoma. Two studies have showed that chemotherapy is more effective than radiotherapy alone in elderly glioblastoma patients with a methylated MGMT promoter. Furthermore, it has been shown that bevacizumab added to chemoradiotherapy in newly diagnosed glioblastoma does not improve survival. Treatment with lomustine or retreatment with temozolomide (in patients with a longer temozolomide-free interval) can be considered in Glioblastoma recurrence, but with modest effectivity.

Despite somewhat prolonged progression-free survival, treatment with lomustine plus bevacizumab did not confer a survival advantage over treatment with lomustine alone in patients with progressive glioblastoma [1)]. Adjuvant PCV chemotherapy is now part of standard of care in newly diagnosed WHO grade III oligodendroglial tumors at least in the tumors with combined loss of 1p/19q. Adjuvant PCV also clearly improves survival in newly diagnosed high-risk low-grade glioma.

For recurrent WHO grade II and grade III tumors, chemotherapy is the standard and commonly temozolomide is used instead of lomustine or PCV due to better tolerance. Although about half of the patients show an objective response to this treatment, this response however is usually of limited duration, with the exception of oligodendroglial tumors with combined 1p/19q loss.

With the current data available, early chemotherapy is now part of the management of nearly all diffuse glioma.

Ongoing studies investigate whether chemoradiotherapy with concomitant and adjuvant temozolomide also improves outcome in elderly patients with glioblastoma treated with a short schedule of radiotherapy. Furthermore, the value of combined chemoradiotherapy with temozolomide for grade III astrocytoma without 1p/19q loss is currently being investigated, but it will take however many years before the results of this study become available. Clearly, low-grade glioma patients benefit from adjuvant chemotherapy, but the optimal way of identifying these patients (1p/19q loss? IDH mutated? CIMP or MGMT promoter methylated tumors?) remains to be established. Also, whether in large low-grade gliomas, initial treatment with chemotherapy alone can be considered is at present unclear, but the prevailing data suggest that this approach may decrease survival.

Current treatment results in the recurrent glioma are of rather modest effectivity, and it is recommended that these patients are enrolled in clinical trials aiming at the improvement of outcome. Although patient selection can still be improved, it is unlikely that with the currently available cytotoxic drugs outcome can be further enhanced. This implies that for further improvement of outcome new drugs are needed. This should be a high priority [2)].

1)
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2)
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6088309/