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The impact of short-course hypofractionated radiotherapy on multimodality treatment utilisation, compliance, and outcome in glioblastoma patients: a Danish patterns of care study

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Abstract

Background: The aim of this retrospective registry-based Danish patterns of care study was (1) to evaluate the real-world utilisation of short-course hypofractionated radiotherapy (HFRT) in glioblastoma (GBM) patients over time, and (2) to evaluate the impact of short-course HFRT by assessing trends in multimodality treatment utilisation, compliance, and outcome.

Material and methods: Data of all adults with newly diagnosed pathology-confirmed GBM between 2011 and 2019 were extracted from the nationwide Danish Neuro-Oncology Registry. Short-course HFRT was defined as a fraction size of > 2 Gy to a planned dose of > 30 Gy. Patterns of care were assessed. To analyse trends in the assignment to short-course HFRT, and in radiotherapy (RT) compliance, multivariable logistic regression was applied. To analyse trends in survival, multivariable Cox regression was used.

Results: In this cohort of 2416 GBM patients, the utilisation of short-course HFRT significantly increased from ca. 10% in 2011 to 33% in recent years. This coincided with the discontinued use of palliative regimens and a decreased use of conventional fractionation. The proportion of patients proceeding to RT remained stable at ca. 85%. The proportion of patients assigned to chemoradiotherapy (CRT) remained stable at ca. 60%; the use of *short-course hypofractionated* CRT increased with ca. 10%, while the use of *conventionally fractionated* CRT decreased with ca. 10%. Compliance with conventionally fractionated and short-course HFRT was respective 92% and 93%, and significantly increasing in recent years. In the complete cohort, the median overall survival remained stable at ca. 11 months. Assignment to *short-course HFRT* was independently associated with shorter survival.

Conclusion: In Denmark, the use of short-course HFRT significantly increased in recent years. Nonetheless, the overall utilisation of RT and chemotherapy did not increase on a population level. Nor did survival change. In contrast, compliance with both conventionally fractionated RT and short-course HFRT increased.

Keywords: Glioblastoma; conventionally fractionated radiotherapy; hypofractionated radiotherapy; long-course radiotherapy; patterns of care; short-course radiotherapy; survival.