

Observational Study

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# A novel scoring system proposal to guide surgical treatment indications for high grade gliomas in elderly patients: DAK-75

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## Abstract

High-grade gliomas are the most prevalent neurooncological disease in adults, their incidence increases with age, peaking in the seventh decade. This paper aims to address how to select patients for surgical resection by identifying pre-surgical predictors of 12-month mortality in newly diagnosed HGG patients aged  $\geq 75$  years. A prognostic score will be proposed to guide surgical decisions based on expected survival. Retrospective observational single-center cohort study was carried out at the "Città della Salute e della Scienza-Molinette" University Hospital in Turin, Italy. All consecutive patients aged  $\geq 75$  years newly diagnosed with HGG were included, regardless of whether they underwent surgical resection. Clinical, radiological, histological and molecular data were collected. Variables potentially available at the time of diagnosis were considered to develop a multivariable logistic regression predictive model, with 12-months overall survival as the dependent variable. 102 patients aged 75 years or older received a new diagnosis of high-grade glioma, of whom 68 underwent surgical resection. Patients undergoing surgery were slightly younger (76.9 vs 79.0 years,  $p = 0.007$ ) and had better performance status (median KPS 80 vs 70). Most tumors undergoing surgery were localized in cortical or subcortical non-motor areas ( $p < 0.001$ ) and less frequently deep-seated ( $p = 0.023$ ) or multifocal ( $p < 0.001$ ). A predictive model, the DAK-75 score, was developed: the AUROC of the final model was 0.822 (95% CI 0.741-0.902). The score includes clinical presentation, tumor location, and KPS, ranging from 0 to 20, categorizing risk scores into low-risk and high-risk groups ( $< 8$  or  $> 8$ ). Higher scores corresponded to fewer surgical patients and higher one-year mortality rates (92.2% vs 47.1%,  $p < 0.001$ ). DAK-75 score may represent a valuable tool in the decision-making process for neurosurgical intervention in elderly patients diagnosed with HGG. Further studies are needed to externally and prospectively validate the scoring system.

**Keywords:** Elderly; Glioblastoma; Glioma; Score.

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