5-Aminolevulinic Acid for Glioblastoma recurrence resection

5-ALA should be regarded as a useful and safe intraoperative tool in recurrent glioma surgery 1).

Prior treatment modalities, such as radiation or chemotherapy, do not invalidate the 5-aminolevulinic acid guided resection 2).

However, there are controversies on the 5-ALA fluorescence status in Glioblastoma recurrence resection, with specific reference to pseudoprogression or radionecrosis; therefore, the safety and accuracy of operative planning in 5-ALA-assisted procedures in the recurrent context are still unclear.

In a systematic review and meta-analysis of comparative studies on the use of 5-ALA in newly diagnosed and recurrent Glioblastoma, consistently conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. Data on fluorescence status and correlation between fluorescence and histological findings were collected. They performed a meta-analysis of proportions to estimate the pooled rates of each outcome.

Three online medical databases (PubMed, Scopus, Cochrane Library) were screened, 448 articles were evaluated, and 3 papers were finally included for data analysis. Fluorescence rate was not different between newly diagnosed and recurrent Glioblastoma \( p = 0.45 \); odds ratio (OR): 1.23; 95% CI: 0.72-2.09; \( I^2 = 0\% \), while the rate of 5-ALA fluorescence-positive areas not associated with histological findings of Glioblastoma cells was higher in recurrent Glioblastoma \( p = 0.04 \); OR: 0.24; 95% CI: 0.06-0.91; \( I^2 = 19\% \). Furthermore, there were no cases of radionecrosis in false-positive samples, while inflammation and signs of pseudoprogression were found in 81.4% of the cases.

Therefore, a robust awareness of 5-ALA potentialities and pitfalls in recurrent Glioblastoma surgery should be considered for a cognizant surgical strategy. Further clinical trials could confirm the results of the present meta-analysis 3).


