

5-aminolevulinic acid trial to correlate intraoperative fluorescence intensity with histologic cellularity

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Winner of the Stryker Neuro-oncology Award, Darryl Lau, MD, presented results from A prospective phase II clinical trial of 5-aminolevulinic acid to correlate intraoperative fluorescence intensity with histologic cellularity during the 83rd Annual Scientific Meeting of the American Association of Neurological Surgeons (AANS).

Due to paucity of studies, a phase II clinical trial was undertaken to correlate the intensity of 5-aminolevulinic acid (ALA) fluorescence with degree of [tumor](#) cellularity during resection of high grade gliomas.

A single-center, single arm, phase II clinical trial of ALA fluorescence-guided resection of high-grade gliomas was held from August 2010 to February 2014. Biopsies were graded on a four-point scale (zero = none to three = highest) based on ALA fluorescence intensity by the neurosurgeon and independently based on tumor cellularity by a neuropathologist.

The correlation of ALA fluorescence intensity to tumor cellularity and adverse events proved interesting. A total of 211 biopsies from 59 patients were included: 79.7 percent glioblastoma. ALA intensity-three correlated with tumor presence in 97.4 percent of cases and ALA intensity of zero correlated with tumor absence in 93.0 percent of cases. For all tumor types, glioblastoma, high grade and recurrent tumors, ALA fluorescence intensity-three correlated strongly with cellularity grade

three; correlation coefficients were 0.65, 0.66, 0.65, and 0.62, respectively. Specificity and positive predictive value (PPV) of ALA intensity three–cellularity grade three match ranged from 95 percent to 100 percent, and 86 percent to 100 percent, respectively.

In samples without tumor, 35.4 percent had ALA fluorescence. Of those, 90.9 percent contained reactive astrocytes and atypical cells; 8.1 percent were normal brain. In non-fluorescent samples, 62.3 percent had [tumor cells](#) present. ALA associated complication was 1.7 percent.

ALA demonstrated high PPV and negative predictive value (NPV), and ALA intensity three correlated strongly with cellularity grade-three. However, even in the absence of tumor cells, reactive changes including inflammation may lead to ALA fluorescence.

Provided by American Association of Neurological Surgeons

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