Morphological analysis of CDC2 and glycogen synthase kinase 3beta phosphorylation as markers of g2 --> m transition in glioma.

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Public Summary:

Scientific Abstract:
G2 --> M transition is a strategic target for glioma chemotherapy. Key players in G2 --> M transition include CDC2 and glycogen synthase kinase 3beta (GSK3beta), which are highly regulated by posttranslational phosphorylation. This report is a morphological analysis of CDC2 and GSK3beta phosphorylation using immunohistochemistry in gliomas with different biological properties. GBM showed a 2.8-fold and 5.6-fold increase in number of cells positive for pThr161CDC2 and a 4.2- and 6.9-fold increase in number of cells positive for pTyr15CDC2 relative to oligodendroglioma and ependymoma, respectively. Elevated labeling for inhibited phospho-CDC2 (pTyr15CDC) correlates with elevated levels of phosphorylated glycogen synthase kinase 3beta (GSK3beta). 71% of the GBM cases showed intermediate to high intensity staining for pSer9SGK3beta 53% of oligodendroglioma, and 73% of ependymoma showed low intensity staining. CDC2 gene amplification correlates with increased survival in glioblastoma multiforme (GBM) and astrocytoma WHO grades II-III, but not in oligodendroglioma WHO grades II-III.