Methods: This prospective study analyzed the data of 39 patients with Glioblastoma who underwent preoperative MRI and surgery in the period between 1st Aug 2016 and 31st July 2018 in the department of neurosurgery in the university hospital Schleswig-Holstein campus Kiel. Eight MR parameters including perfusion-weighted (rrCBF%, rrCBV%), diffusion-weighted (ADC-minimum), susceptibility-weighted (microbleeding according to Likert scale) and MR spectroscopic (Choline/creatine, Choline/NAA, NAA/Creatine and MI/Creatine-Index) imaging were studied and compared between patients with positive and negative molecular genetic markers for IDH, MGMT and 1p19q.
Results: Choline to Creatine-Index and Choline to NAA-Index were increased in patients with positive 1p/19q in comparison with patients with negative marker (p=0,014 and 0,038, respectively). No statistically relevant differences were found in the MR features between patients with positive and negative MGMT. All 39 patients in our study did not have IDH-mutations so we could not make a comparison in relation to this marker.
Conclusion: Metabolic parameters of the MR-Spectroscopy can distinguish between patients with positive 1p/19q from those with negative 1p/19q. This could lead to an early subtyping for these patients with poor prognosis. Because of the increasing prognostic value of IDH 1 and 2-mutations further studies to compare the MR features of patients with positive and negative IDH mutations are required.

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ORALLY ADMINISTERED 5-AMINOLEVULINIC ACID FOR ISOLATION AND CHARACTERIZATION OF CIRCULATING TUMOR-DERIVED EXTRACELLULAR VESICLES IN GLIOBLASTOMA PATIENTS

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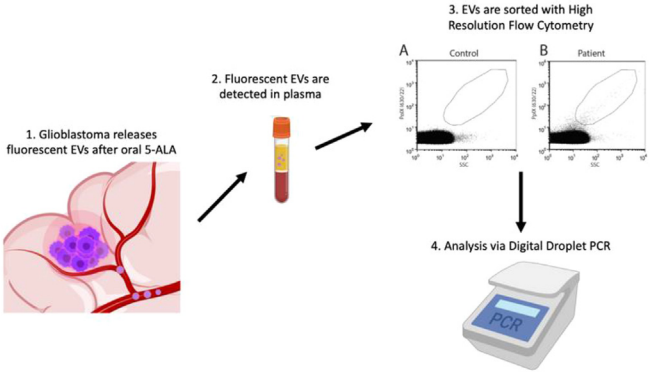
Background: Current methods for diagnosing glioblastoma (GB) require invasive procedures, with significant mortality and morbidity. Extracellular Vesicles (EVs) are small, cell-derived vesicles that contain miRNAs, proteins and lipids, and are possible candidates for liquid biopsies. GB-derived EVs can be found in the blood of patients, but are difficult to distinguish from circulating non-tumor EVs. 5-aminolevulinic acid (5-ALA) is administered orally to GB patients to facilitate tumor visualization, as it is metabolized to fluorescent protoporphyrin IX (PpIX) accumulating in glioma cells. In this study we assessed whether PpIX accumulates in GB-derived EVs and whether these EVs could be isolated and characterized to enable a liquid biopsy in GB.
Methods: EVs were isolated from the conditioned media of U87 cells treated with 5-ALA by differential ultracentrifugation. Blood samples were collected and processed from healthy controls and patients undergoing 5-ALA guided surgery for GB. High resolution flow cytometry (hFC) enabled detection and sorting of PpIX positive EVs, which were subsequently analyzed by digital droplet PCR (ddPCR).
Results: PpIX positive EVs were detected in conditioned cell culture media as well as in patient samples after administration of 5-ALA. Using hFC the PpIX positive EVs were sorted for further analysis with ddPCR, which indicated the presence of EVs and GB-associated miRNAs.
Conclusion: GB-derived EVs can be isolated from the plasma of GB patients by utilizing 5-ALA induced fluorescence. While many challenges remain, our findings show new possibilities for the development of blood-based liquid biopsies in GB patients.



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ASSOCIATION OF ISOCITRATE DEHYDROGENASE (IDH) STATUS WITH EDEMA TO TUMOR RATIO AND ITS CORRELATION WITH IMMUNE INFILTRATION IN GLIOBLASTOMA

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Background: The extent of preoperative peritumoral edema in glioblastoma (GBM) has been negatively correlated with patient outcome. As several ongoing studies are investigating T-cell based immunotherapy in GBM, we conducted this study to assess whether peritumoral edema with potentially increased intracranial pressure, disrupted tissue homeostasis and reduced local blood flow has influence on immune infiltration and affects survival.
Methods: A volumetric analysis of preoperative imaging (gadolinium enhanced T1 weighted MRI sequences for tumor size and T2 weighted sequences for extent of edema (including the infiltrative zone, gliosis etc.) was conducted in 144 patients using the BrainlabÒ software. Immunohistochemical staining was analyzed for lymphocytic- (CD 3+) and myeloid (CD15+) tumor infiltration. A retrospective analysis of patient-, surgical-, and molecular characteristics was performed using medical records.
Results: The edema to tumor ratio was neither associated with progression-free nor overall survival (p=0.90, p=0.74). However, GBM patients displaying IDH-1 wildtype had significantly higher edema to tumor ratio than patients displaying an IDH-1 mutation (p=0.01). Immunohistopathological analysis did not show significant differences in lymphocytic or myeloid tumor infiltration (p=0.78, p=0.74) between these groups.
Conclusion: In our cohort, edema to tumor ratio had no significant correlation with immune infiltration and outcome. However, patients with an IDH-1wildtype GBM had a significantly higher edema to tumor ratio compared to their IDH-1 mutated peer group. Further studies are necessary to elucidate the underlying mechanisms.

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QUALITY INDICATORS IN NEURO-ONCOLOGY: MODIFIED DELPHI PROCESS FOR THE DEVELOPMENT OF A QUALITY INDICATOR SET FOR ASSESSMENT OF GLIOMA CARE

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Background: Quality Indicators (QIs) are important tools to assess the quality and variability of oncological care. However, their application in neuro-oncology is limited. The objective of this study was to develop a set of QIs for glioma, covering process and outcome indicators.
Methods: First a systematic literature search was performed in peer-reviewed