P04.17. DIAGNOSTIC VALUE OF PLASMA AND URINARY 2-HYDROXYGLUTARATE TO IDENTIFY PATIENTS WITH IDH-MUTATED GLIOMA
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BACKGROUND: Mutation of IDH1 gene is a prognostic factor and a diagnostic hallmark of gliomas. Mutant IDH1 enzyme can convert α-KG into 2-Hydroxyglutarate(2HG); mutated gliomas have elevated amounts of intracellular 2HG. We analyzed 2HG concentration in plasma and urine in glioma patients(PTS) to identify a biomarker of IDH1 gene mutation

METHODS: All PTS had a prior histological confirmation of glioma, a recent brain MRI (within 28 days prior, other neoplastic and metabolic diseases. Plasma and urine samples were taken from all PTS and 2HG concentrations determined by liquid chromatography tandem mass spectrometry; Mann-Whitney test was used to test for differences in metabolite concentrations. ROC curve was used to evaluate the cut off value of 2HG biomarker.

RESULTS: 84 PTS were enrolled: 38 with IDH1 mutated and 46 IDH1 wild-type. Among PTS with mutant IDH1 we had 21 high-grade gliomas (HGG) and 17 low-grade gliomas (LGG); among PTS with IDH1 wild-type we had 35 HGG and 11 LGG. In all PTS we analyzed the mean 2HG concentration in plasma (P_2HG), in urine (U_2HG) and the ratio between P_2HG and U_2HG (R_2HG). We found an important significant difference in R_2HG between PTS with and without IDH1 mutation: 24.9 versus 15.3, respectively. The optimal cut-off value of R_2HG to identify glioma PTS with and without IDH1 mutation was 15.9 (S 63%, SP 76% and accuracy (A) 70%); in only PTS with HGG the optimal cut-off value was 20 (S 76%, SP 89%, A 84%, PPV 80%, NPV 86%). No association between the grade or size of tumor and R_2HG were found. In 7 out of 7 HGG PTS, we found a correlation between R_2HG value and response to treatment.

CONCLUSIONS: By analyzing the R_2HG derived from individual plasma and urine 2HG levels is possible discriminate glioma PTS with and without IDH1 mutation. A larger samples need to be analyzed to investigate this method to monitor treatment efficacy.