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Different IDH Mutation and 1p/19q Codeletion Rates between Astrocytoma, Oligodendrocytoma and Mixed Gliomas

Jingchi Sun1, Zhen Wang1
Department of Neurosurgery, General Hospital of Shenyang Military Region, Shenyang, Liaoning, China

Isocitrate dehydrogenase (IDH-mt) mutations and loss of chromosomes 1p and 19q (codeleltion 1p / 19q) have been used in the diagnosis of gliomas, particularly in the identification of oligodendrocytomas. We performed and analyzed genetic detections with 3 types of gliomas diagnosed by morphological methods. Methods: DNA extracted from the tumor tissue of 136 patients with astrocytoma, oligodendrogliomas and mixed gliomas was subjected to capillary electrophoresis by fluorescence PCR for the detection of codetion 1p and 19q and the sequencing of the DNA for IDH mutations. The results were analyzed by SPSS 22.0 software with a chi-square test for a significant difference (p

As the most common primary tumor of the central nervous system, glioma accounts for around 80% of intracranial malignancies [1]. Diagnosis by microscopy, grade di ؤ use and gliomas are histologically divided into two subtypes, oligodendroglioma and astrocytoma. In addition, a third mixed category of oligoastrocytoma is used to describe cases of glioma with the morphology of both oligodendroglioma and astrocytoma [2]. In 2016, molecular genetic parameters were first introduced in the diagnosis of glioma within the World Health Organization (WHO), ClDssificDtion of Tumors of the Central Nervous System [3]. The new WHO classification of brain tumors defines di ؤ erent di و used gliomas mainly according to the presence or absence of isocitrate dehydrogenase 1 or 2 (IDH) mutations (IDH-mt) and combines complete suppression of the short arm of chromosome 1 and the long arm of chromosome 19 (co-deletion 1p / 19q) [4]. Therefore, the diagnosis of an anaplastic oligodendroglioma requires the presence of both a 1p / 19q co-deletion and IDH1-mt or IDH2-mt

Fresh tumor samples from patients were instantly frozen in liquid nitrogen and immediately stored at –80 ° C until DNA extraction. For comparison, blood samples from healthy unrelated controls free from brain tumors or other major CNS tumors were collected. DNA was extracted from tumor tissue and peripheral blood samples from patients using the Qigen DNA FFPE tissue kit and the Tiangen peripheral blood drawer kit and used for PCR DmplificDtion Fluorescence Capillary electrophoresis PCR a was used to detect loss of chromosomes 1p and 19q, and PCR sequencing analysis to determine mutations in the HDI gene. DNA from peripheral blood samples was used as a control. Because 1p36.1-36.3 and 19q13.3 are common missing areas in chromosome 1 and chromosome 19, for the synthesis of primers, we chose three STR sites in each of them. These are D1S489, D1S548, D1S1592, D19S219, D19S412, PLA2G4C. These fluorescence markers were also produced during the primer synthesis process. New PCR products were used to detect 1p / 19q co-deletion by electrophoresis and IDH mutations by DNA sequencing

The incidence of HDI mutants and 1p / 19q codeletion has been reported with significant differences in different subtypes of gliomas diagnosed by morphological methods. In particular, the rate of 1p / 19q co-deletion in the oligodendrocytoma is significantly higher than that in the astrocytoma [16-19]. Even in mixed gliomas with characteristics of oligodendrocytes and astrocytes, the rate of codetion 1p / 19q is always higher than that of astrocytomas [14,20]. Our results are also in agreement with previous reports. In addition, we find some patients with IDHwildtype and 1p / 19q codeletion in the three histological types of gliomas. This observation could be linked to the origin and differentiation of the glioma. We also note that, in the oligodendroblastoma group, 54.6% (6/11) of the cases were found with IDH mutation but 1p / 19q not codelegated, which means that certain results of the genetic test did not support the histopathological diagnosis. Therefore, the genetic test must be supplemented by the histopogic typing of gliomas, in particular for oligoastrocytomas. Our initial objective was to assess the diagnostic difference between histopathological methods and genetic detections for HDI mutations and codeletion 1p / 19q in the glioma, in particular oligodendroglial tumors. This study shows that, out of a total of 136 patients with astrocytoma, pure oligodendroglial tumors (oligodendrogliomas) and mixed gliomas, 28.7% of the cases were detected with IDH mutations, including IDH 1-mt p.R132H and IDH 2-mt,

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