Abstract

Astrocytic tumours include a heterogeneous group of tumours with different histological features. Their diagnostics and classification could be difficult in some cases. Besides histological features of the neoplastic tissue genetic mutations in the tumour cells are important for the basic characteristic of the tumours.

According to the histological and clinical characters tumours of the central nervous system are divided into several malignancy grades. Low-grade astrocytomas are the most common solid tumours of children. More malignant forms (mainly glioblastomas) represent a significant group of tumours of CNS of adult patients. *IDH1*, *TP53*, *EGFR*, *PTEN* typically belong among genes which carry mutations in the cells of astrocytic tumours. Mostly pilocytic astrocytomas are often connected with mutations of the *BRAF* gene which is a part of the mitogen activated protein kinase (MAPK) pathway.

Many modern methods are used for the investigation of the mutations in the genome of the neoplastic tissue. PCR, real-time PCR and sequencing are the most important molecular methods. The most often used cytogenetic methods which are based on the hybridization of the DNA are FISH and microarray techniques. In some cases also immunological methods could be used.

The correct diagnostics of the tumour and its classification into the malignancy grade is essential for the prognosis assessment and for the choice of the subsequent therapy.

Key words

astrocytic tumours, anaplastic astrocytoma, diffuse astrocytoma, pilocytic astrocytoma, glioblastoma, cytogenetic and molecular biological methods