Abstract

**TARGET POPULATION:** Adult patients (age ≥ 18 years) who have suspected low-grade diffuse glioma.

**QUESTION:** What are the optimal neuropathological techniques to diagnose low-grade diffuse glioma in the adult?

**RECOMMENDATION:** LEVEL I: Histopathological analysis of a representative surgical sample of the lesion should be used to provide the diagnosis of low-grade diffuse glioma.

**LEVEL III:** Both frozen section and cytopathologic/smear evaluation should be used to aid the intraoperative assessment of low-grade diffuse glioma diagnosis. A resection specimen is preferred over a biopsy specimen, to minimize the potential for sampling error issues.

**TARGET POPULATION:** Patients with histologically-proven WHO grade II diffuse glioma.

**QUESTION:** In adult patients (age ≥ 18 years) with histologically-proven WHO grade II diffuse glioma, is testing for IDH1 mutation (R132H and/or others) warranted? If so, is there a preferred method?

**RECOMMENDATION:** LEVEL II: IDH gene mutation assessment, via IDH1 R132H antibody and/or IDH1/2 mutation hotspot sequencing, is highly-specific for low-grade diffuse glioma, and is recommended as an additional test for classification and prognosis.

**TARGET POPULATION:** Patients with histologically-proven WHO grade II diffuse glioma.

**QUESTION:** In adult patients (age ≥ 18 years) with histologically-proven WHO grade II diffuse glioma, is 1p/19q loss-of-heterozygosity testing warranted? If so, is there a preferred method?

**RECOMMENDATION:** LEVEL III: 1p/19q loss-of-heterozygosity testing, by FISH, array-CGH or PCR, is recommended as an additional test in oligodendroglial cases for prognosis and potential treatment planning.

**TARGET POPULATION:** Patients with histologically-proven WHO grade II diffuse glioma.

**QUESTION:** In adult patients (age ≥ 18 years) with histologically-proven WHO grade II diffuse glioma, is MGMT promoter methylation testing warranted? If so, is there a preferred method?

**RECOMMENDATION:** There is insufficient evidence to recommend methyl-guanine methyltransferase (MGMT) promoter methylation testing as a routine for low-grade diffuse gliomas. It is recommended that patients be enrolled in properly designed clinical trials to assess the value of this and related markers for this target population.

**TARGET POPULATION:** Patients with histologically-proven WHO grade II diffuse glioma.
QUESTION: In adult patients (age ≥18 years) with histologically-proven WHO grade II diffuse glioma, is Ki-67/MIB1 immunohistochemistry warranted? If so, is there a preferred method to quantitate results?

RECOMMENDATION: LEVEL III: Ki67/MIB1 immunohistochemistry is recommended as an option for prognostic assessment.

KEYWORDS: 1p/19q loss-of-heterozygosity; Astrocytoma; Isocitrate dehydrogenase (IDH1, IDH2); Ki67/MIB1; Low-grade diffuse glioma; Methyl-guanine methyl-transferase (MGMT); Oligodendroglioma

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