Mini Review

Glioma Molecular Markers: Histology and Imaging Integration

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Abstract

The updated version in 2016 of world health organization (WHO)classification of brain tumors included multiple molecular markers in combination with histology and magnetic resonance imaging to reach an integrated diagnosis. A review of the current literature addressing the glioma molecular markers (IDH,1p19q, BRAF 600, RELA etc.,) based on histology and imaging based layered diagnosis is illustrated.

Keywords: Glioma; IDH; MRI

Introduction

In the 2016 edition of WHO classification, MRI has included on the front page making it vital for the final integrated diagnosis of gliomas. So far, At least seven molecular markers are established with their counter imaging features bringing revolution in the diagnosis and management of brain tumors.

The major markers are IDH,1p19q, ATRX, BRAF, MGMT, H3K27 and RELA. This review provides a very overview of molecular markers and imaging relevance.

Review of Evidence

a.   IDH mutation: It is seen in diffuse low-grade gliomas.2HG MRS has excellent diagnostic relevance [1].

1p19q.

b.   Codeletion: The presence of more than 50 percent T2/FLAIR mismatch and or calcifications can predict 1p19q deletion status and in addition IDH mutation confers with high diagnostic probability of oligodendroglioma [2].

c.   ATRX: Some findings of brain MR/CT including mild cerebral atrophy, partial or complete a genesis of the corpus coliseum and hypoplasia of the white matter. The ATRX protein seems to be involved in normal myelination [3].

d.   BRAF mutation: BRAF V600 mutation is encountered usually with low grade gliomas. Mostly there are cystic lesion with solid nodule [4].

e.   MGMT: ADC and rCBF are promising imaging bio markers in clinical routine to predict the MGMT promoter methylation in primary glioblastoma patients [5].

f.   H3K27 mutation: H3K27 mutant status and clinically aggressive course cannot be ruled out based on low grade histology on the initial biopsy, exophytic growth only focal or minimal enhancement or an extra pontine location such as mid brain or medulla. These results favor an integrated approach employing a combination of clinical, radiologic, histologic features as well as H3K27 immuno hisyoxjemistry for the diagnostic subclassification of adult brain stem gliomas [6].

g.   RELA: Mostly supratentorial ependymoma are RELA positive [7].

Conclusion

This review provides a very brief overview linking molecular markers and imaging and provides insight for more research and establishment of criterions.

References

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