



Abstract

Background: Gliomas are the most frequent primary brain tumors. According to World Health Organization guidelines, gliomas are graded into four groups (Group I-IV). This histological grading will determine prognosis and treatment of the patient. Morphological criteria are not always accurate. Tumor proliferation index is a potent quantitative marker for tumor behavior and prognosis, also it's the basis of gliomagenesis. Ki-67 immunohistochemistry examination for determining proliferation index has been suggested as an ancillary marker in deciding the definitive grading of glioma.

Objective: To analyze the correlation between Ki-67 labeling index and histopathological grading of glioma in Indonesian population.

Methods: One hundred and six formalin fixed-paraffin embedded tissue of glioma patients were collected from 4 different hospitals. Expression of Ki-67 was detected using immunohistochemistry staining and the labeling index was counted. The association between Ki-67 labeling index and histopathological grading was analyzed.

Results: Age range of patient were 1-73-years old, with male predominance (55.70%). Glioblastoma was the most common diagnosis accounting for 41.51% of all samples. Ki-67 labeling index cut point of 6.35% was obtained and significantly sensitive and specific for determining low- or high-grade glioma ($p < 0.001$).

Conclusion: A significant association between Ki-67 labeling index and histopathological grading in Indonesian glioma patients has been revealed. The result of this study may be used to improve diagnostic and grading accuracy of glioma cases in Indonesia, especially in small biopsy specimens.

Keywords: Ki-67, labeling index, glioma, grading.



Abstrak

Latar Belakang: Glioma merupakan tumor primer otak tersering. Menurut panduan dari World Health Organization, glioma dibagi menjadi 4 *grade* (*grade* I-IV). *Grading* histologis ini akan menentukan prognosis dan tata laksana pasien. Kriteria morfologis tidak selalu akurat. Indeks proliferasi tumor merupakan penanda kuantitatif poten untuk perilaku tumor serta prognosis dikarenakan proliferasi sel tumor merupakan dasar dari proses gliomagenesis. Pemeriksaan imunohistokimia Ki-67 untuk penentuan indeks proliferasi telah disarankan sebagai pemeriksaan tambahan untuk membantu penetapan *grading* glioma.

Tujuan: Menganalisis hubungan antara Ki-67 *labeling index* dan *grading* histopatologis glioma pada populasi di Indonesia.

Metode: Seratus enam blok parafin pasien yang terdiagnosis glioma dikumpulkan dari 4 rumah sakit. Dilakukan penentuan *labeling index* dengan penghitungan ekspresi Ki-67 yang terdeteksi dengan pewarnaan imunohistokimia. Hubungan antara Ki-67 *labeling index* dan *grading* histologis kemudian dianalisis.

Hasil: Rentang usia pasien glioma antara 1 hingga 73 tahun, terutama berjenis kelamin pria (55.70%). Glioblastoma merupakan diagnosis terbanyak (41.51%). Nilai batas Ki-67 *labeling index* sebesar 6.35% diperoleh dan secara signifikan sensitif dan spesifik untuk membedakan *low-* atau *high-grade glioma* ($p < 0.001$).

Kesimpulan: Didapatkan hubungan signifikan antara Ki-67 *labeling index* dan *grading* histopatologis pada pasien glioma di Indonesia. Hasil penelitian ini dapat digunakan untuk memperkuat akurasi diagnostic dan *grading* kasus-kasus glioma di Indonesia, terutama pada spesimen biopsi yang berukuran kecil.

Kata Kunci: Ki-67, *labeling index*, glioma, *grading*.