Ekspresi penanda sel punca kanker CD133 glioma manusia: hubungannya dengan keganasan, pluripotensi dan kondisi hipoksia = Expression of human glioma cancer stem cells CD133 correlation with degree of malignancy pluripotency and hypoxia / Febrial Hikmah

Febrial Hikmah, author

Abstrak

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Glioma adalah tumor otak primer yang sampai saat ini sering timbul resistensi terapi. Sel punca glioma diduga berperan penting dalam resistensi dan rekurensi sel tumor. Sel punca glioma memiliki penanda permukaan CD133 dan mampu berpluripotensi dengan mengekspresikan Oct4. Kondisi hipoksia tumor juga berperan dalam self renewal sel punca glioma. Tujuan dari penelitian ini adalah untuk mengetahui hubungan keberadaan sel punca glioma dengan keganasan, pluripotensi dan kondisi hipoksia. Cross sectional digunakan sebagai desain penelitian dengan jumlah sampel sebanyak 35 jaringan, terdiri atas 15 glioma derajat keganasan tinggi dan 20 glioma derajat keganasan rendah. Pengukuran ekspresi relatif mRNA CD133, Oct4 dan HIF-1α menggunakan metode qRTPCR. Protein HIF-1α dilihat ekspresinya melalui teknik imunohistokimia. Ekspresi relatif mRNA CD133 dan Oct4 lebih tinggi bermakna (p < 0.05, Mann-Whitney) pada glioma derajat keganasan tinggi dibanding glioma derajat keganasan rendah. Protein HIF-1α lebih tinggi bermakna (p < 0,01, Mann-Whitney) pada glioma derajat keganasan tinggi dibanding glioma derajat keganasan rendah. Terdapat hubungan ekspresi sel punca glioma CD133 dengan pluripotensi serta kondisi hipoksia (r = 0,518, r = 0,339; Spearman?s rho) serta pluripotensi dengan kondisi hipoksia pada derajat keganasan tinggi (r = 0,749; Spearman?s rho). Ekspresi relatif mRNA CD133, Oct4 dan HIF-1α meningkat seiring dengan peningkatan derajat keganasan. Terdapat hubungan yang bermakna antara keberadaan penanda sel punca glioma CD133 dengan pluripotensi dan kondisi hipoksia pada glioma derajat keganasan tinggi.
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ABSTRACT
Glioma is primary brain tumor with frequent therapeutic resistance. Glioma cancer stem cells were considered to play a role in resistance and recurrence of tumor cells. Glioma cancer stem cells expressed CD133 on their surface and capable of pluripotency as expressed by Oct4 positive. Tumor hypoxic condition also play a role in glioma cancer stem cells self renewal. Aim of this study is to investigate correlation between glioma cancer stem cells, degree of malignancy, pluripotency and hypoxia. Design of this study is cross sectional with 35 glioma samples comprises of 20 low grade malignant glioma and 15 high grade malignant

glioma. Expression of mRNA CD133, Oct4 and HIF-1α were measured using qRT-PCR. HIF-1α protein expression was detected by immunohistochemistry from glioma sample. mRNA CD133 and Oct4 expression significantly higher ($p < 0.05$, Mann-Whitney) in high grade malignant glioma compared to low grade malignant glioma. HIF-1α tissue expression significantly higher ($p < 0,01$, Mann-Whitney) in high grade malignant glioma compared to low grade malignant glioma. There was correlation between expression of CD133 glioma cancer stem cells marker with pluripotency and hypoxia ($r = 0,518$, $r = 0,543$; Spearman?s rho) and pluripotency with hypoxia in high grade malignant glioma ($r = 0,749$; Spearman?s rho). mRNA CD133, Oct4 and HIF-1α expression increased with high grade malignant glioma. There was significant correlation between CD133 glioma cancer stem cell marker with pluripotency and hypoxia in high grade malignant glioma, Glioma is primary brain tumor with frequent therapeutic resistance. Glioma cancer stem cells were considered to play a role in resistance and recurrence of tumor cells. Glioma cancer stem cells expressed CD133 on their surface and capable of pluripotency as expressed by Oct4 positive. Tumor hypoxic condition also play a role in glioma cancer stem cells self renewal. Aim of this study is to investigate correlation between glioma cancer stem cells, degree of malignancy, pluripotency and hypoxia. Design of this study is cross sectional with 35 glioma samples comprises of 20 low grade malignant glioma and 15 high grade malignant glioma. Expression of mRNA CD133, Oct4 and HIF-1α were measured using qRT-PCR. HIF-1α protein expression was detected by immunohistochemistry from glioma sample. mRNA CD133 and Oct4 expression significantly higher ($p < 0.05$, Mann-Whitney) in high grade malignant glioma compared to low grade malignant glioma. HIF-1α tissue expression significantly higher ($p < 0,01$, Mann-Whitney) in high grade malignant glioma compared to low grade malignant glioma. There was correlation between expression of CD133 glioma cancer stem cells marker with pluripotency and hypoxia ($r = 0,518$, $r = 0,543$; Spearman’s rho) and pluripotency with hypoxia in high grade malignant glioma ($r = 0,749$; Spearman’s rho). mRNA CD133, Oct4 and HIF-1α expression increased with high grade malignant glioma. There was significant correlation between CD133 glioma cancer stem cell marker with pluripotency and hypoxia in high grade malignant glioma]