

## ABSTRAK

### HUBUNGAN EKSPRESI HIF-1A JARINGAN DENGAN EKSPRESI NF- $\kappa$ B JARINGAN PADA PASIEN DIFFUSE LARGE B-CELL LYMPHOMA YANG BARU TERDIAGNOSIS

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**Latar Belakang:** *Diffuse Large B-cell* Lymphoma merupakan limfoma paling banyak dari keseluruhan kasus NHL yang tergolong agresif namun merespon baik terhadap kemoterapi. Kondisi hipoksia pada jaringan tumor berperan penting dalam progresivitas limfoma, salah satunya melalui ekspresi Hypoxia-Inducible Factor-1 alpha (HIF-1 $\alpha$ ), yang turut dipengaruhi oleh jalur transkripsi Nuclear Factor kappa-B (NF- $\kappa$ B). Namun, hubungan langsung antara ekspresi HIF-1 $\alpha$  dan NF- $\kappa$ B pada pasien Diffuse Large B-Cell Lymphoma (DLBCL) belum banyak diteliti.

**Metode:** Penelitian *cross-sectional* dilakukan terhadap 40 pasien DLBCL naif di RSUP dr. Kariadi, Semarang yang tercatat di rekam medis. Ekspresi HIF-1 $\alpha$  dinilai berdasarkan persentase, intensitas, dan skor overekspresi; sedangkan ekspresi NF- $\kappa$ B dinilai berdasarkan kategori positif ( $\geq 30\%$ ) atau negatif ( $< 30\%$ ). Uji Mann-Whitney digunakan untuk menilai hubungan antar variabel.

**Hasil:** Dari 40 subjek, didapatkan adanya hubungan signifikan antara ekspresi HIF-1 $\alpha$  yang dinilai berdasarkan persentase, intensitas, dan skor overekspresi dengan nilai  $p < 0.05$  terhadap NF- $\kappa$ B. Tidak terdapat hubungan signifikan antara HIF-1 $\alpha$  maupun NF- $\kappa$ B terhadap variabel klinis lain seperti usia, jenis kelamin, LDH, Hb, subtipe, dan NCCN-IPI.

**Kesimpulan:** Terdapat hubungan signifikan antara ekspresi HIF-1 $\alpha$  jaringan dengan ekspresi NF- $\kappa$ B jaringan pada pasien DLBCL, mendukung hipotesis adanya interaksi biologis keduanya dalam patogenesis limfoma.

**Kata Kunci:** DLBCL, *Diffuse large B-cell* Lymphoma, HIF-1 $\alpha$ , NF- $\kappa$ B

## ABSTRACT

### ASSOCIATION BETWEEN TISSUE EXPRESSION OF HIF-1A AND NF-KB IN NEWLY DIAGNOSED PATIENTS WITH DIFFUSE LARGE B-CELL LYMPHOMA

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**Background:** Diffuse Large B-Cell Lymphoma (DLBCL) is the most common subtype of non-Hodgkin lymphoma (NHL). Although it is classified as aggressive, it responds well to chemotherapy. Tumor hypoxia plays a critical role in the progression of lymphoma, partly mediated through the expression of Hypoxia-Inducible Factor-1 alpha (HIF-1 $\alpha$ ), which is also regulated by the transcriptional pathway of Nuclear Factor kappa-B (NF- $\kappa$ B). However, the direct relationship between HIF-1 $\alpha$  and NF- $\kappa$ B expression in DLBCL patients has not been extensively studied.

**Methods:** A cross-sectional study was conducted on 40 newly diagnosed DLBCL patients at Dr. Kariadi General Hospital, Semarang, as recorded in their medical records. HIF-1 $\alpha$  expression was assessed based on percentage, staining intensity, and overexpression score; while NF- $\kappa$ B expression was categorized as positive ( $\geq 30\%$ ) or negative ( $< 30\%$ ). The Mann-Whitney U test was used to evaluate the association between variables.

**Results:** Among 40 subjects, a significant association was found between HIF-1 $\alpha$  expression—based on percentage, intensity, and overexpression score—and NF- $\kappa$ B expression ( $p < 0.05$ ). No significant relationship was observed between HIF-1 $\alpha$  or NF- $\kappa$ B expression and clinical variables such as age, sex, LDH, hemoglobin level, immunohistochemical subtype, or NCCN-IPI score.

**Conclusion:** There is a significant association between HIF-1 $\alpha$  and NF- $\kappa$ B expression in the tumor tissue of DLBCL patients, supporting the hypothesis of a biological interaction between the two in lymphoma pathogenesis.

**Keywords:** DLBCL, Diffuse Large B-Cell Lymphoma, HIF-1 $\alpha$ , NF- $\kappa$ B