

ABSTRAK

HUBUNGAN EKSPRESI mRNA RAC-1 DAN INVASI LIMFOVASKULAR DENGAN METASTASIS KELENJAR GETAH BENING IPSILATERAL PADA PASIEN *TRIPLE NEGATIVE BREAST CANCER OPERABLE*

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Latar Belakang : *Triple Negative Breast Cancer* (TNBC) merupakan subtype kanker payudara yang bersifat agresif dengan tingkat kekambuhan dan metastasis tinggi. Salah satu faktor penting dalam penyebaran kanker adalah invasi limfovaskular (LVI), yang menggambarkan kemampuan sel kanker menembus pembuluh darah atau limfe. RAC-1 merupakan anggota keluarga Rho GTPase yang memiliki peran penting dalam reorganisasi sitoskeleton dan migrasi sel kanker.

Tujuan: Menganalisis hubungan antara ekspresi mRNA RAC-1 dan invasi limfovaskular dengan metastasis kelenjar getah bening aksila ipsilateral pada pasien TNBC *operable*.

Metodologi penelitian : Penelitian ini menggunakan desain *cross sectional* dengan 59 pasien TNBC *operable* yang menjalani tindakan bedah di RSUP Dr. Sardjito. Ekspresi mRNA RAC-1 dianalisis dengan qRT-PCR, sedangkan invasi limfovaskular dinilai melalui pemeriksaan histopatologi. Analisis regresi logistik berganda dilakukan untuk menilai hubungan antara ekspresi RAC-1, invasi limfovaskular, dan metastasis kelenjar getah bening aksila ipsilateral.

Hasil : Ekspresi RAC-1 tinggi berhubungan signifikan dengan metastasis KGB Aksila Ipsilateral (aOR = 7,25; p = 0,018; 95% CI: 1,41–37,37). Invasi limfovaskular positif juga berhubungan signifikan dengan metastasis KGB Aksila Ipsilateral (aOR = 15,79; p = 0,000; 95% CI: 3,81–65,49). Kombinasi keduanya meningkatkan kemungkinan terjadinya metastasis ke KGB Aksila.

Kesimpulan : Ekspresi mRNA RAC-1 dan invasi limfovaskular berhubungan signifikan dengan metastasis kelenjar getah bening (KGB) aksila ipsilateral pada pasien Triple-Negative Breast Cancer (TNBC) operabel.

Kata kunci: RAC-1 (*Ras-related C3 botulinum toxin substrate*), Invasi Limfovaskular, Metastasis KGB Axilla Ipsilateral, *Triple Negative Breast Cancer* (TNBC) *Operable*.

ABSTRACT

Association of mRNA RAC-1 Expression and Lymphovascular Invasion with
Ipsilateral Axillary Lymph Node Metastasis in Operable Triple-Negative Breast
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Background: Triple-Negative Breast Cancer (TNBC) is an aggressive subtype of breast cancer characterized by high rates of recurrence and metastasis. One of the key factors involved in cancer dissemination is lymphovascular invasion (LVI), which reflects the ability of tumor cells to penetrate blood or lymphatic vessels. RAC-1, a member of the Rho GTPase family, plays a crucial role in cytoskeletal reorganization and cancer cell migration.

Objective: To analyze the association between mRNA RAC-1 expression and lymphovascular invasion with ipsilateral axillary lymph node metastasis in operable TNBC patients.

Research Methodology : This cross-sectional study included 59 operable TNBC patients who underwent surgical resection at Dr. Sardjito General Hospital. RAC-1 mRNA expression was measured using quantitative real-time PCR (qRT-PCR) from tumor tissues, while LVI status was assessed by histopathological examination. Binary logistic regression was applied to evaluate associations between RAC-1 expression, LVI, and axillary lymph node metastasis.

Conclusion: High RAC-1 expression was significantly associated with lymph node metastasis (aOR = 7.25; $p = 0.018$; 95% CI: 1.41–37.37). LVI positivity also showed a strong association (aOR = 15.79; $p = 0.000$; 95% CI: 3.81– 65.49). The combination of both variables increased the likelihood of axillary lymph node metastasis.

Keywords: RAC-1 (Ras-related C3 botulinum toxin substrate), Lymphovascular Invasion, Ipsilateral Axillary Lymph Node Metastasis, *Operable* Triple Negative Breast Cancer (TNBC).