

# MMP-9 dan VEGF-C Sebagai Prediktor Terjadinya Metastasis Kelenjar Getah Bening pada Karsinoma Tiroid Papiler = MMP-9 and VEGF-C as Lymph Node Metastases Predictor of Papillary Thyroid Carcinoma

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## Abstrak

Data epidemiologi menunjukkan bahwa dari semua keganasan tiroid, sekitar 80% hingga 85% di antaranya adalah karsinoma tiroid papiler (KTP). Biomarker untuk memprediksi metastasis KGB leher kini mulai banyak diteliti pada pasien KTP seperti matrix metalloproteinase (MMP) dan vascular endothelial growth factor (VEGF). Meskipun belum terdapat kesepakatan diagnostik terhadap MMP-9 dan VEGF-C sebagai prediktor metastasis KGB pada KTP, beberapa studi telah menunjukkan hubungan keduanya terhadap metastasis KGB. Penelitian ini bertujuan untuk mengetahui hubungan antara MMP-9 dengan VEGF-C pada metastasis KGB leher pada pasien KTP. Peneliti melakukan studi desain potong lintang di RSUPN Cipto Mangunkusumo, Jakarta Pusat. Pasien yang terdiagnosis KTP berdasarkan pemeriksaan histopatologi diinklusi dalam penelitian ini. Pasien yang telah terbukti memiliki metastasis jauh dan data tidak lengkap dieksklusi dalam penelitian. Ekspresi MMP-9 dan VEGF-C diteliti di Laboratorium Patologi Anatomi FKUI/RSCM. Sebanyak 62 pasien diinklusi dalam penelitian ini, dengan proporsi 80,6% perempuan dan 19,4% laki-laki. Ekspresi MMP-9 ditemukan lebih tinggi pada kelompok metastasis ( $p < 0,001$ ). Hal yang sama juga terjadi pada perbedaan median ekspresi VEGF-C, yang mana median ekspresi penanda ini pada kelompok metastasis lebih tinggi dibandingkan non-metastasis ( $p < 0,001$ ). Peneliti menemukan bahwa terdapat korelasi positif dan bermakna antara H-score MMP-9 dan VEGF-C, dengan koefisien korelasi 0,618. Terdapat hubungan yang bermakna antara ekspresi MMP-9 dan VEGF-C dengan kejadian metastasis KGB leher pada pasien KTP. Ekspresi MMP-9 dan VEGF-C ditemukan lebih tinggi pada kelompok metastasis. Peningkatan ekspresi MMP-9 juga berkorelasi positif dengan peningkatan ekspresi VEGF-C. ....Approximately 80% to 85% of thyroid malignancies were papillary thyroid carcinoma (PTC).

Biomarkers to predict cervical lymph node metastases have now begun to be widely studied in PTC patients, such as matrix metalloproteinase (MMP) and vascular endothelial growth factor (VEGF). Although there was no diagnostic agreement on MMP-9 and VEGF-C as predictors of lymph node metastasis in PTC, several studies have shown an association between the two for lymph node metastasis. This study aims to determine the relationship between MMP-9 and VEGF-C in cervical lymph node metastases in PTC patients. A cross-sectional design study was conducted at Cipto Mangunkusumo General Hospital, Jakarta. Patients diagnosed with PTC based on histopathological examination were included in this study. Patients with distant metastases were excluded from the study. The expression of MMP-9 and VEGF-C was investigated at the Anatomical Pathology Laboratory FKUI/RSCM. A total of 62 patients were included in this study, with 80.6% female and 19.4% male. The MMP-9 expression was found to be higher the metastatic group ( $p < 0.001$ ). The same results were also found in VEGF-C expression, where the median expression of this marker in the metastatic group was higher than the non-metastatic group ( $p < 0.001$ ). We found a significant and positive correlation between the H-score of MMP-9 and VEGF-C (correlation coefficient of 0.618). There is a significant relationship between the expression of MMP-9 and VEGF-C with the cervical lymph node metastases in PTC patients. The MMP-9 and VEGF-C expression was higher

in the metastatic group. The increased MMP-9 expression is also positively correlated with increased VEGF-C expression.