

# Metastasis Kelenjar Getah Bening pada Karsinoma Papiler Tiroid, Kajian Terhadap Mutasi BRAF V600E dan Promoter TERT = Lymph Node Metastasis in Papillary Thyroid Carcinoma, A Study of BRAF V600E and TERT Promoter Mutation Abstract

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## Abstrak

**Tujuan.** Penelitian ini dibuat untuk mengetahui peranan mutasi BRAF V600E dan TERT dalam kejadian metastasis kelenjar getah bening (KGB) leher pada pasien kanker tiroid papiler (KTP)

**Metode.** Penelitian ini merupakan studi potong lintang, melibatkan pasien KTP di RSUPN Dr. Cipto Mangunkusumo, DKI Jakarta. Data-data diperoleh secara retrospektif berdasarkan catatan rekam medis, kecuali untuk mutasi BRAF V600E dan Promoter TERT. Spesimen jaringan tumor pasien kanker tiroid papiler ditransfer ke Laboratorium Terpadu FKUI. DNA diekstraksi menggunakan QIAamp DNA FFPE Tissue Kit sebanyak 3-8 potongan dengan ketebalan FFPE 5-10 mikrometer. Multiplikasi gen BRAF dilakukan dengan KOD One Polymerase Chain Reaction (PCR) Master Mix (Toyobo KMM-201), sementara multiplikasi gen TERT dilakukan dengan PCR Master Mix (2X MyTaq HS Red Mix, primer forward, reverse, dan Nuclear-free water). Analisis data dilakukan dengan SPSS versi 20. Hasil. Peneliti menginklusi 42 pasien KTP dengan 19 (45%) mengalami mutasi BRAF, 20 (48%) mengalami mutasi TERT, dan 20 (48%) mengalami metastasis KGB. Mutasi BRAF ditemukan berhubungan dengan kejadian metastasis KGB [ $p < 0,001$ , OR = 25,333 (IK95% 4,924–130,340)], sementara mutasi TERT ditemukan tidak berhubungan. Pasien yang mengalami mutasi BRAF tanpa TERT memiliki risiko 18,000 (IK95% 2,012–161,051) lebih tinggi untuk mengalami metastasis KGB dibandingkan pasien tanpa kedua mutasi. Lebih lanjut, adanya mutasi TERT yang berbarengan dengan mutasi BRAF membuat risiko meningkat menjadi 60,000 (4,718–763,043) lebih tinggi dibandingkan pasien tanpa kedua mutasi. Kesimpulan. Mutasi BRAF berhubungan dengan metastasis KGB pasien KTP, namun tidak dengan mutasi TERT. Namun, kehadiran mutasi TERT pada pasien KTP dengan mutasi BRAF meningkatkan risiko metastasis KGB.

.....**Objective.** This study was designed to determine the role of BRAF V600E and TERT mutations in the incidence of neck lymph node (LN) metastasis in patients with papillary thyroid cancer (PTC). **Methods.** This was a cross-sectional study, involving KTP patients at Dr. Cipto Mangunkusumo Hospital, DKI Jakarta. Data were obtained retrospectively based on medical records, except for BRAF V600E and TERT promoter mutation. Tumor tissue specimens of PTC's patients were transferred to the Laboratorium Terpadu FKUI. DNA was extracted using QIAamp DNA FFPE Tissue Kit for 3-8 pieces with FFPE thickness of 5-10 micrometers. BRAF gene multiplication was performed with KOD One Polymerase Chain Reaction (PCR) Master Mix (Toyobo KMM-201), while TERT gene multiplication was performed with PCR Master Mix (2X MyTaq HS Red Mix, primers forward, reverse, and Nuclear-free water). Data analysis was performed with SPSS version 20. **Results.** We included 42 PTC's patients with 19 (45%) patients had BRAF mutation, 20 (48%) patients had TERT mutation, and 20 (48%) patients had LN metastasis. BRAF mutation was associated with the LN metastasis [ $p < 0.001$ , OR = 25.333 (95% CI 4.924-130.340)], while TERT mutation was not. Patients with BRAF+ and TERT- had an 18,000 (IK95% 2,012-161,051) higher risk of

LN metastasis than patients with BRAF- and TERT-. Furthermore, the presence of TERT mutation along with BRAF mutation increased the risk to 60,000 (4,718-763,043) higher than patients with BRAF- and TERT-. Conclusion. BRAF mutation was associated with LN metastasis in PTC's patients, but not TERT mutations. However, the presence of TERT mutation in PTC's patients with BRAF mutation increased the risk of LN metastasis.