



## KORELASI GAMBARAN ULTRASONOGRAFI DENGAN EKSPRESI mRNA ESTROGEN DAN PROGESTERON RECEPTOR PADA KARSINOMA TIROID

Nurhuda Hendra Setyawan<sup>1</sup>, Lina Choridah<sup>2</sup>, Yana Supriatna<sup>2</sup>, Retno Sutomo<sup>3</sup>, Sudarmanta<sup>2</sup>, Didik Setyo Heriyanto<sup>4</sup>

- <sup>1</sup> Mahasiswa Program Studi Magister Ilmu Kedokteran Klinik, Fakultas Kedokteran Kesehatan Masyarakat dan Keperawatan, Universitas Gadjah Mada, Yogyakarta
- <sup>2</sup> Departemen Radiologi, Fakultas Kedokteran Kesehatan Masyarakat dan Keperawatan, Universitas Gadjah Mada, Yogyakarta
- <sup>3</sup> Departemen Ilmu Kesehatan Anak, Fakultas Kedokteran Kesehatan Masyarakat dan Keperawatan, Universitas Gadjah Mada, Yogyakarta
- <sup>4</sup> Departemen Patologi Anatomi, Fakultas Kedokteran Kesehatan Masyarakat dan Keperawatan, Universitas Gadjah Mada, Yogyakarta

### Intisari

**Latar Belakang:** Mortalitas dan morbiditas karsinoma tiroid tidak terlalu tinggi, namun menurunkan kualitas hidup penderitanya. Ultrasonografi adalah modalitas pencitraan non-invasif yang sensitif untuk tiroid. Prevalensi karsinoma tiroid lebih tinggi pada populasi perempuan, sehingga banyak penelitian yang mencoba mengetahui peranan hormon seksual tertentu terhadap kejadian karsinoma tiroid.

**Tujuan:** Mengetahui gambaran ultrasonografi dan status reseptor hormon estrogen dan progesteron pada karsinoma tiroid. Mengetahui korelasi gambaran ultrasonografi dengan status reseptor hormon tersebut.

**Metode:** Penelitian ini merupakan penelitian uji korelasi potong-lintang non-eksperimental, dan pengambilan sampel dengan cara retrospektif. Sampel diambil secara berurutan non-acak. Citra ultrasonografi diinterpretasi ulang oleh Dokter Spesialis Radiologi dengan keahlian pencitraan kepala leher. Sampel jaringan biopsi dianalisis ulang menggunakan metode qRT-PCR terhadap mRNA gen reseptor estrogen dan progesteron. Dilakukan analisis deskriptif karakteristik ultrasonografi dan analisis korelasi karakteristik ultrasonografi dengan ekspresi mRNA reseptor estrogen dan progesteron.

**Hasil:** Mayoritas penderita karsinoma tiroid adalah perempuan, namun usia rerata laki-laki lebih tua. Sebagian besar nodul karsinoma tiroid adalah solid (90%), hipoeoik (63,3%), *taller-than-wide* (76,7%), batas lobulasi/ireguler (53,3%), dengan mikrokalsifikasi (63,3%). Ekspresi mRNA ER meningkat pada 93% subjek dengan rerata lebih tinggi pada laki-laki (28,43 vs 24,77). Ekspresi mRNA PR meningkat pada 50% subjek dengan rerata lebih tinggi pada laki-laki (4,44 vs 3,12). Terdapat korelasi negatif lemah yang bermakna secara statistik antara ekspresi mRNA PR dengan skor ACR-TIRADS ( $r = -0,320$ ;  $p = 0,027$ ).

**Kesimpulan:** Terdapat peningkatan ekspresi mRNA ER-PR pada karsinoma tiroid. Estrogen berperan pada proliferasi dan agresivitas nodul, sementara progesteron bersifat protektif pada nodul tiroid.

**Kata kunci:** tiroid, progesteron, estrogen, mRNA, ultrasonografi



## CORRELATION OF ULTRASOUND FINDINGS AND mRNA EXPRESSION OF ESTROGEN AND PROGESTERON RECEPTORS IN THYROID CARCINOMA

Nurhuda Hendra Setyawan<sup>1</sup>, Lina Choridah<sup>2</sup>, Yana Supriatna<sup>2</sup>, Retno Sutomo<sup>3</sup>, Sudarmanta<sup>2</sup>, Didik Setyo Heriyanto<sup>4</sup>

- <sup>1</sup> Student of Clinical Medical Science Master Study Programme, Faculty of Medicine Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta
- <sup>2</sup> Department of Radiology, Faculty of Medicine Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta
- <sup>3</sup> Department of Pediatrics, Faculty of Medicine Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta
- <sup>4</sup> Department of Pathology, Faculty of Medicine Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta

### Abstract

**Background:** Thyroid carcinoma mortality and morbidity are not high, but it is reducing the quality of life. Ultrasonography is a non-invasive and sensitive imaging modality for the thyroid. The prevalence of thyroid carcinoma is higher in female, therefore many studies have tried to determine the role of certain sexual hormones in the incidence of thyroid carcinoma.

**Objective:** Determine the correlation of ultrasound findings with estrogen and progesterone hormone receptors status. Determine the pattern of ultrasound findings and hormone receptor status in thyroid carcinoma.

**Method:** This is a non-experimental cross-sectional correlation study, with retrospective non-random consecutive sampling. Ultrasound images were reinterpreted by a radiologist with expertise in head and neck imaging. Tissue samples were re-analyzed using qRT-PCR for estrogen and progesterone receptor mRNA genes. Descriptive analysis of ultrasound characteristics and receptor status was carried out. Correlation analysis was performed between ultrasound findings and estrogen-progesterone receptor mRNA expression.

**Results:** The majority of patients with thyroid carcinoma were women, but men average age is older. Most thyroid carcinoma nodules were solid (90%), hypoechoic (63.3%), taller-than-wide (76.7%), lobulation/irregular border (53.3%), with microcalcifications (63.3%). ER mRNA expression was increased in 93% of subjects with a higher average in men (28.43 vs 24.77). PR expression of mRNA was increased in 50% of subjects with a higher average in men (4.44 vs 3.12). There is a weak negative correlation that is statistically significant between PR mRNA expression and ACR-TIRADS score ( $\tau_b = -0.320$ ;  $p = 0.027$ ).

**Conclusion:** ER and PR mRNA expression are increased in thyroid carcinoma. Estrogen plays a role in the proliferation and aggressivity of nodules, while progesterone has a protective role in thyroid nodules.

**Keywords:** thyroid, estrogen, progesterone, mRNA, ultrasonography