

Association of Vitamin D and Progesterone receptors expression with the histological characteristics of papillary thyroid carcinoma

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OBJECTIVES

Vitamin D (VDR) and progesterone (PGR) receptors expression have been previously described in papillary thyroid carcinoma but data regarding association of this expression with tumor histologic characteristics are scarce.

To address this issue we conducted a retrospective analysis of paraffin-embedded specimens from adult patients with papillary thyroid carcinoma

METHODS

Patients and samples

Formalin-fixed, paraffin-embedded (FFPE) specimens from adult patients (age >20 years at the time of the surgery) with papillary thyroid carcinoma who underwent total thyroidectomy from 2009 to September 2012 were retrieved from the pathology database of the Theagenio Cancer Hospital. Diagnosis was determined on the basis of FNA and ultrasound findings before surgery, as well as morphological and immunohistochemical characteristics after surgery.

Ten samples of normal thyroid tissue adjacent to thyroid adenoma were also included as normal tissue. No patients received any preoperative radiotherapy or chemotherapy.

Real-time Quantitative RT-PCR Analysis

Once the archived pathology samples were identified and diagnosis was confirmed, the workflow included (a) specimen processing, (b) total RNA extraction (RNeasy FFPE kit, Qiagen GmbH, Hilden, Germany), (c) cDNA synthesis (RT² First Strand Kit, Qiagen), and (d) Real-time PCR analysis.

RESULTS

Thirty two paraffin-embedded specimens from primary tumors with histologically confirmed papillary thyroid carcinoma were finally included in the analysis (Figure 1).

The age of the patients ranged between 20-56 years (mean 35.2 years). Mean weight and size of the extracted thyroid tissue was 22 ± 17 gr and 15.8 ± 12.7 cm, respectively.

The histologic parameters of the tumors are depicted in table 1.

Results from the real-time quantitative RT-PCR analysis confirmed an increased expression of VDR in 56% of the specimens with a mean fold increase of 4.8 (p=0.032) compared to adjacent normal thyroid tissue. Overexpression of PGR was also found in 34% of the tested specimens with a mean fold increase of 12.8 (p=0.004) compared to normal thyroid tissue. Co-expression of the two receptors was found in seven specimens (22%).

Expression of PGR but not VDR was significantly associated with the tumor size (r = 0.645, p = 0.007).

Distribution of VDR και PGR expression in papillary thyroid carcinoma

■ Overexpression of VDR in papillary thyroid carcinoma
■ Overexpression of PGR in papillary thyroid carcinoma
■ Co-expression of VDR και PGR in papillary thyroid carcinoma

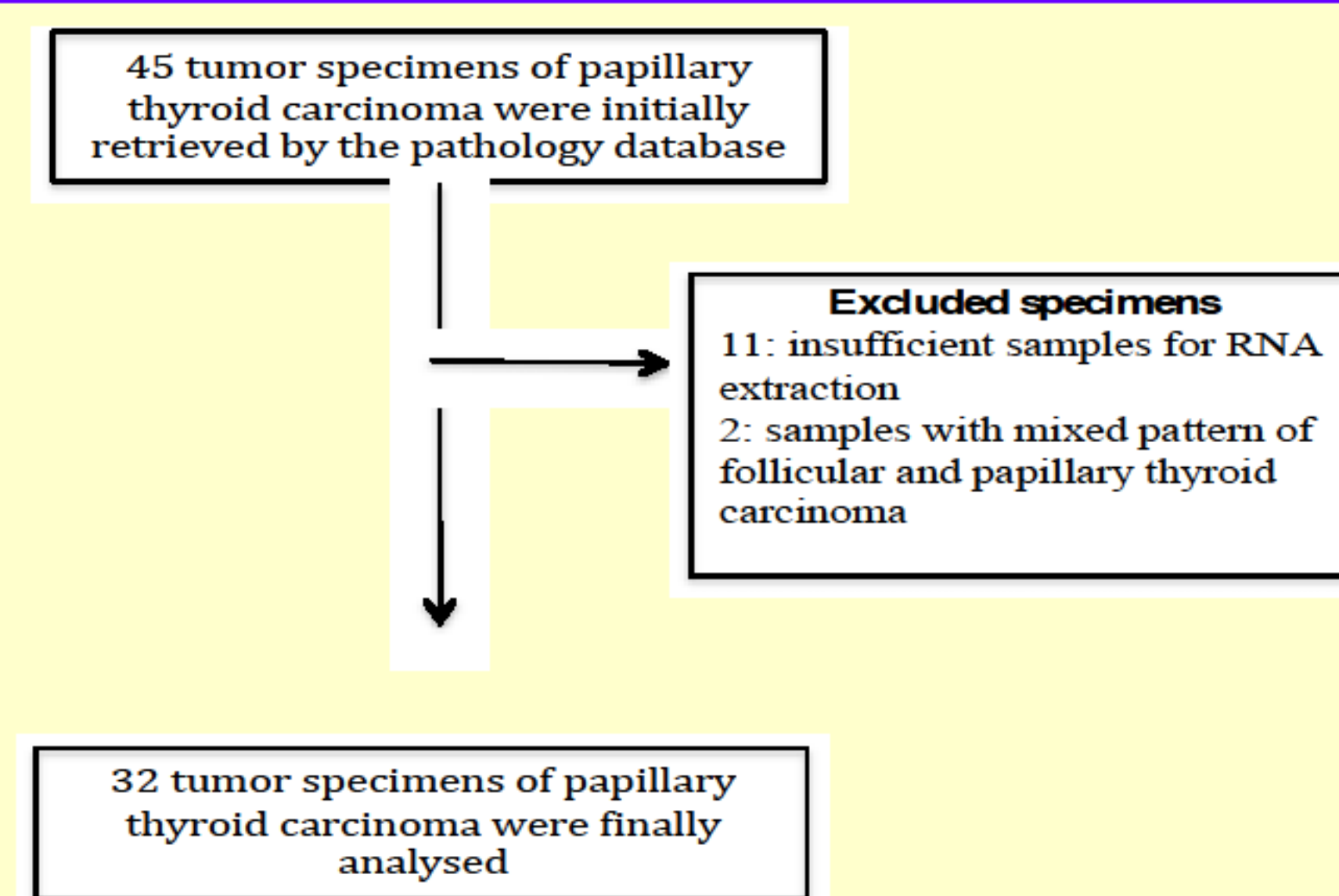
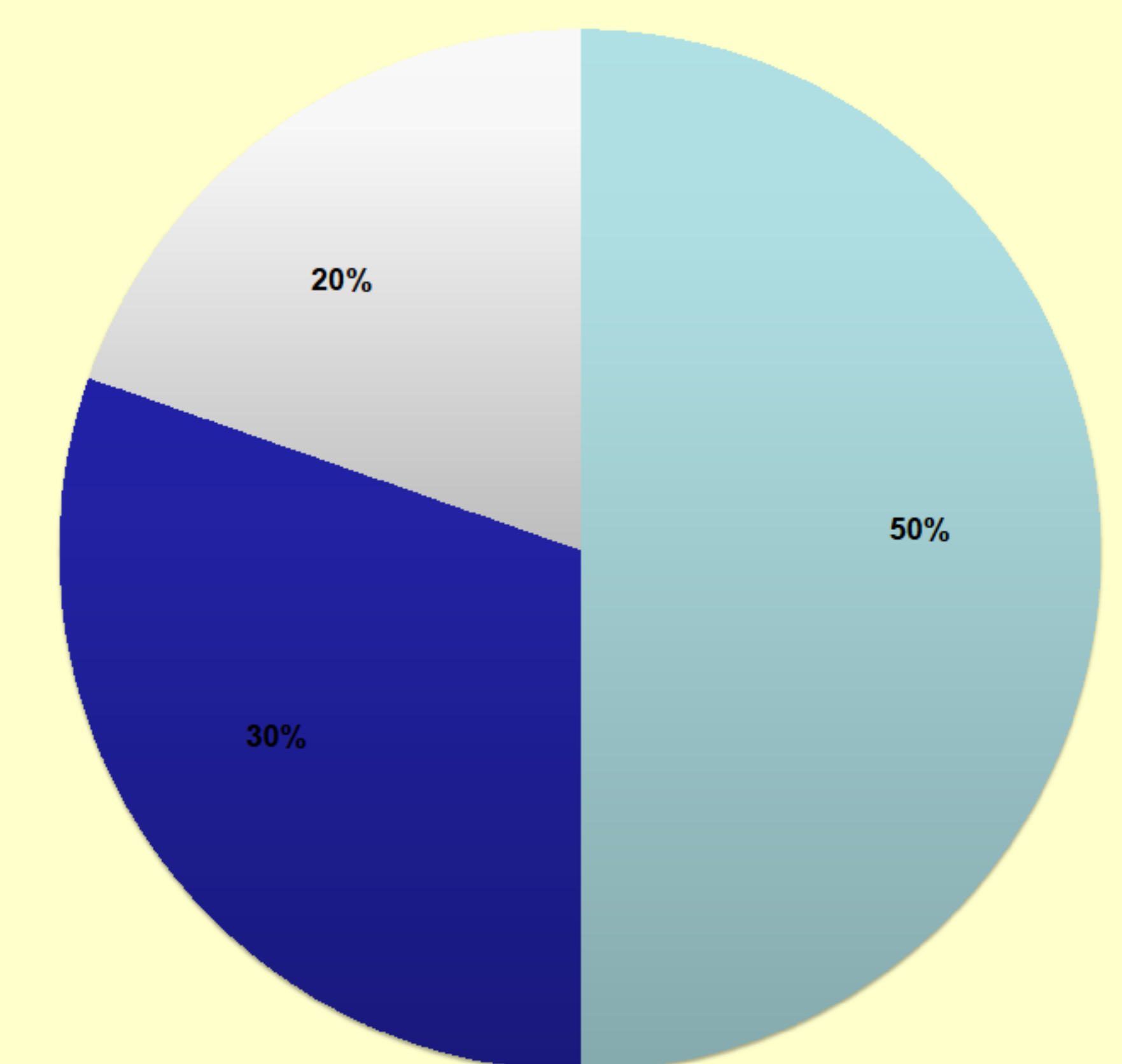


Figure 1. Flow chart

Table 1. Histologic characteristics of the tumor-specimens

Histologic parameters	Value n (%)
Bilateral lesions	14 (43)
Multifocal lesions	15 (46)
Lymph node metastasis	15 (46)
Thyroid gland's capsule invasion	16 (50)
Intrathyroidal invasion	25 (78)
Extrathyroidal invasion	14 (43)
Vascular invasion	10 (31)

CONCLUSIONS

Vitamin D receptor is overexpressed in the majority of patients with papillary thyroid carcinoma compared to normal thyroid tissue. However, the potential role of this receptor in the histological behavior of PTC remains to be elucidated. Expression of progesterone receptor may be associated with a less favorable prognosis of this tumor type.

