BRAF overexpression is associated with BRAF V600E mutation in papillary thyroid carcinomas

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ABSTRACT. A common mutation in the BRAF gene, comprising the T1799A nucleotide transversion, which leads to the V600E amino acid substitution in the BRAF protein, has been observed in about 50% of papillary thyroid carcinomas (PTCs). However, BRAF protein expression has been rarely examined in such tumors. Clinical studies have shown important associations between BRAF mutation and clinical parameters in PTC, such as progression, invasion, and recurrence. The aim of this study was to evaluate the association between BRAF protein overexpression and the BRAF V600E mutation in a group of
PTC patients. The study group included 116 patients with PTC from Araújo Jorge Hospital, Goiânia, Goiás, Brazil. Immunohistochemistry was utilized to analyze BRAF protein expression. Presence of the BRAF V600E mutation was determined by polymerase chain reaction amplification and restriction fragment length polymorphism, and confirmed by direct sequencing. The chi-square test with Yates correction and the Fisher exact test were used for statistical analysis. BRAF overexpression was detected in 55 patients with PTC (47.4%) and the BRAF V600E mutation was observed in 74 patients (63.8%). In the studied group, significant associations were observed between the BRAF V600E mutation and BRAF protein overexpression (P = 0.0115), and also between BRAF overexpression and extra-thyroid extension of the tumor (P = 0.0111). This study demonstrated a significant association between BRAF overexpression and the BRAF V600E mutation in PTC, highlighting the importance of these molecular events in the process of PTC carcinogenesis.

**Key words:** BRAF protein; Papillary thyroid carcinoma; BRAF; V600E mutation