Role of sex hormones in the pathogenesis and development of thyroid tumors: thyroid cancer are about 2.7 fold times more frequently diagnosed in the reproductive age women compared to similar aged men (Davies et al, 2006); recent pregnancy associated with a doubling in thyroid cancer risk (Rossing et al, 2000).

Aim of the study was to analyze estrogen and progesterone receptors expression in differentiated thyroid cancer and to correlate it with clinical and molecular features (BRAFV600E).

The phenomenon of "receptor conversion" between primary differentiated thyroid tumor and metastatic lesion in 7 cases of primary papillary thyroid cancer and lymph-node metastases (LN).

ERα positive staining > 60%; weakly positive staining 1-60%; negative = 0%; weakly positive staining 1-60%; negative = 0%;

The phenomenon of "receptor conversion" between primary differentiated thyroid tumor and metastatic lesion in 7 cases of primary papillary thyroid cancer and lymph-node metastases (LN)

1. clonal selection of less differentiated receptor negative cells during the metastatic process

2. loss of receptor expression at the metastatic site

DISCUSSION

ERs and PR are frequently expressed in DTC (65.8% and 74.2% respectively); their expression correlates with larger tumor size and, consistently, with a non-incidental diagnosis. Moreover, a trend towards a higher prevalence of local metastases and a higher prevalence of BRAFV600E mutations was observed in ERα and PR expressing tumors, possibly indicating a more aggressive behavior. Although no impact on the outcome of the disease was observed, the evaluation of sex hormones receptors could add insights into the biological behavior of the tumor, and could modify the follow up particularly in fertile women with persistent disease. In addition, the phenomenon of receptor conversion which has been reported in thyroid tumors for the first time, could represent another issue to consider in the follow-up, and needs further studies in order to understand its effect on thyroid tumor prognosis. Finally, the finding of a strong expression of ER in some thyroid tumors suggests the need to evaluate the possible usefulness of an anti-estrogen therapy in selected cases to attenuate the growth-promoting effects of estradiol.