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Molecular chaperones expression levels and localization in non-tumoral and tumoral thyroid tissues

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Papillary thyroid carcinoma (PTC) is the most frequently occurring subtype of thyroid cancer. Exosomes (EXs) secreted from cells to the extracellular environment play an important role in intercellular communication in normality and pathology. Recent data indicates that tumor cells-derived EXs contribute to cancer progression through the modulation of tumor microenvironment [1]. Heat Shock Protein (HSPs) are often overexpressed during carcinogenesis and different studies shown that they can be released by tumors cells and that the mechanism of release is mediated by EXs pathway. In this project we performed an immunomorphological study to investigate Hsp60, 90,70,27 levels expression profile in thyroid tissue from patients with benign goiter (used as benign disease) and patients with PTC. Moreover for each patient, blood samples were collected before and a one week after surgery, to obtain EXs. We performed Western Blotting analysis to verify the presence and the levels of the same HSPs. The immunistochemistry shown an overexpression of Hsp60,90 and 27 in the PTC cases comparison with peritumoral tissue and with goiter cases. Instead the Hsp70 levels showed no significant changes. In particular Hsp60, 90 and 27 were visible at cytoplasmic and membrane levels. Data regarding exosomal fraction assessment by standard methods (TEM, and WB analysis for Alix) to identify exosomes confirmed their identity. The levels of Hsp60, 90,27 in the exosomes of patients with PTC before surgery were significantly higher than in the exosomes from the same patients after surgery. The data obtained shown that, as demonstrated in other cancer type [2], the HSP levels studied increased in PTC specimens respect to goiter specimens. Moreover the membrane localization of these HSP suggested a their release in tumor microenvironment, in fact we observed exosomal HSP before surgery in PTC patients. The HSP decreases after surgery indicated that if disease recurrence occurs, HSP levels will increase again. For this reason we ipotized that chaperonins could be good candidates as biomarkers of PTC.

References

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Key words

Papillary thyroid carcinoma, exosome, hsp.