IMMUNOHISTOCHEMISTRY OF GALECTIN-3 (GAL-3) AND THYROID PEROXIDASE (TPO) MARKERS IN RELATION TO GENDER AND AGE IN PAPILLARY THYROID CARCINOMA (PTC) PATIENTS IN IRAQ

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ABSTRACT

Papillary thyroid carcinoma (PTC) is one of the most common tumors in Iraq. The incidence of females is more than males. The confirmation the validity of the tumour and its type was the aim of this research by using Gal-3 and TPO immune markers to find the correlation between them and the diagnosis of PTC Twenty-nine tissue samples from male and female papillary adenocarcinomas were used to find the correlation between Gal-3 and TPO for use in diagnosing tumors. We find positive correlation between these immune markers and gender with thyroid papillary carcinoma (PTC).

KEYWORDS: Gal-3, TPO, PTC.

I. INTRODUCTION

Thyroid malignant is the most widely recognized endocrine tumor, and is one of only a handful few malignant growths in which frequency is expanding. Patients determined to have all around separated thyroid malignancies have an incredible guess, anyway patients with poorly differentiated thyroid cancer (PDTC) have a poor visualization on the grounds that these tumors don't react to right now affirmed tumor therapeutics.

The cell and non-cell parts of the tumor microenvironment (TME) are factors in tumor development or progression and reaction to treatment in wide range of kinds of human malignant growths, be that as it may, regardless of whether the TME adds to thyroid malignancy development and the poor result related with poor differentiated thyroid carcinoma (PDTC) patients is unexplored.

Goiter is commonest condition introducing to the endocrine specialist. Information shows that in excess of 200 million in individuals have goiter today. Iraq is an endemic area in goiter, mainly in the north and middle Parts (personal communication). One of many studies on about 358 cases of malignant tumors of the thyroid gland in 1981 indicated that redistribution of the different histological types of thyroid carcinoma, also The researcher has indicated That prognosis of cases of differentiated thyroid cancer is worse [1], the papillary thyroid carcinoma is commonest disruption type pathology with female predominance in Iraq as reported in [2].

The CK19, RET, galactin-3 and HBME-1 expression in PTC was higher than that in benign disease cases, but were not specific markers for PTC [3].

The big variety of effects of galactin-3 on cancerous cells are due to the unique structure and various interaction properties of the molecule. Overexpression and changes within the localization of galactin-3 molecules affects the prognosis of the patient and targeting the actions of galactin-3 poses a promising therapeutic strategy for the event of effective therapeutic agents for cancer treatment.

Galectin-3 is a protein that in humans is encoded by the LGALS3 gene [4][5]. Galectin-3 is a member of the lectin family, of which 14 mammalian galectins have been identified, it has an affinity for beta-galactosides and exhibits antimicrobial activity against bacteria and fungi.

The Clinical significance of Galectin-3 is involve in variety of expression levels in various types of fibrosis [6,7]. Elevated levels of galectin-3 are found to be significantly related to higher risk of death in both
acute decompensated coronary failure and chronic coronary failure populations [8] [9], also it play a important role in enhancing the metastatic potential of tumor cells [10].

Thyroid peroxidase (TPO) is an enzyme normally found in the thyroid gland which is is a membrane-bound protein essential for thyroid hormone production, characteristic of functional, normal thyroid cells. It plays an important role in the production of thyroid hormones.

The qualitative and quantitative alterations in TPO activity, TPO messenger ribonucleic acid (mRNA), and protein expression can be related to thyroid changes and have been reported in pathological thyroid tissues [11]. TPO expression has been shown to be significantly higher in thyroid benign as compared to malignancies conditions and normal tissue [12].

so the aim of this study was to evaluated the immune activity of gal-3 and TPO related patients with papillary carcinoma according to the gender and age

II. MATERIALS AND METHODS

About 25 archive blocks of thyroid papillary carcinoma were attended from the Alhussian teaching hospital \ Nassriah \Iraq for achieve immunohistochemistry study .

In the current research, the immunostaining from used was Label led Strep-Avidin Biotin (LSAB+), which was included the following after routine histological preparation :

Tissues: 4μm multi-block pieces with 10 per cent fixed Neutral Buffered Formalin and human tissue coated with paraffin. Mounted on Silanized (S3003) frames. They dried the pieces at 60°C for 60 minutes.

Primary antibody: Antibodies are diluted in Dako Antibody Diluents (S3022).

Control: The negative control is pretreated and then incubated in Antibody Diluents step in the protocol.

Correlation analysis was obtained using Origin(Pro), Version 2021 (Origin Lab Corporationm, Northampton, MA, USA).

III. RESULTS

The result of this study showed there are positive correlation between the positive immunexpression of Gal-3 and positiveTPO at p<0.01 in thyroid papillary carcinoma as showed in chart1.

The microscopic investigation have been showed of galectin-3 expression was presence as some dark-brown color in the cytoplasm and/or nucleous + nuclear membranes shown in images 1, 2.

Also microscope investigation have been showed the positive expression of TPO was presence as dark –brown color in cytoplasm of cells as shown in images 3 and 4.

The correlation study revealed there is high expression between both positive markers Gal-3 and TPO in thyroid papillary carcinoma, also correlation analyses revealed there were a high significant correlation at P<0.01 between the positive immune expression protein of Gal-3 and females gender, while there were negative correlation between the same marker expression and male gender (Chart 1).

The correlation study also showed (Chart 1), there are a significant correlation at P<0.05 between the positive immune expression of TPO+ and females gender, while there were negative correlation between the same marker expression and male gender.

Also the Origin (Pro) correlation analysis showed there were correlation between the positive expression of Gal-3 but didn't reach to significant effect, the same analyses programa definitive negative correlation was found between the positive expression of TPO and papillary thyroid carcinoma cases, could be that due to the size of samples.
Chart 1: correlation between the expression protein of Gal-3 and TPO related to the age and gender.

Figures 1&2: Histopathological section of thyroid papillary carcinoma revealed immuno-expression Gal-3 protein (400X)

Figures 3&4: Histopathological section of thyroid papillary carcinoma revealed immuno-expression TPO protein (400X)
IV. DISCUSSION

immunohistochemistry in thyroid papillary carcinoma casee is essential in the diagnosis cos the Papillary formation is often observed in benign and malignant thyroid diseases, and for that pathological features such as papillary structure with typical complex branches, nuclear features have been widely used in the diagnosis of thyroid disease.

However, due to the heterogeneity of tumors, it is challenging to distinguish PTC from thyroid papillary hyperplasia and isolated nodules with papillary changes.

The result of this study revealed there were relation between the immune expression of both positive Gal 3 and TPO immune markers in diagnosis thyroid papillary carcinoma tissue, one key for microenvironmental factor for tumor progression and treatment resistance in solid tumors is hypoxia. The Gal-3 protected cells from cell death under hypoxia[13], also, it is playing a significant role in cell-to-cell and cell-to-matrix interactions by binding to endogenous glycans[14], so it is highly expression in tumors, by increasing tumor survival and metastatic dissemination, also increased of Gal-3 expression at some point of most cancers development augments tumor growth[15].

Our study result agreed with [16], they detected Gal-3 immune activity in cytoplasm of thyroid papillary carcinoma cells and it could also be detected in cell nucleus, cell surface or outside cell. Also[17] reported that the staining of the expression was in light yellow, dark yellow or brown yellow at a low power field, also the staining appear as diffuse or granular at a high power field magnification in gastric cancerous tissues.

TPO can be used to confirm or rule out benign diseases of differentiated thyroid cancer, Except for low-risk cancers such asminimally invasive follicular carcinoma (MIFC), it can be used as a prognostic factor for thyroid differentiation Cancer and patient follow-up and other markers[18].

V. CONCLUSION

Gal-3 and TPO+ could be used as a prognostic factor for papillary thyroid carcinoma comatographically with other markers.

REFERENCES


