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THESIS



**Role of Apoptosis in Multinodular Goitre, Hashimoto's
Thyroiditis, Follicular Adenoma and Carcinoma of
Thyroid: A Histological and Immunohistochemical Study**

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ABSTRACT

Apoptosis is the physiological process by which unwanted or abnormal cells are eliminated during development or in the maintenance of normal size in an adult tissue.

The main objective of the study was to establish the role of apoptosis in multinodular goitres, Hashimoto's thyroiditis, follicular adenomas and carcinomas of the thyroid.

The sample of this study consisted of 84 multinodular goitres, 15 Hashimoto's thyroiditis, 51 follicular adenomas and 32 thyroid carcinomas. The normal tissue adjacent to the lesion was taken as the control for the study.

Sections of the formalin fixed, paraffin embedded tissues were taken for haematoxylin and eosin staining for morphological estimation of apoptotic and mitotic indices. Serial sections were taken for the immunohistochemical staining of Bcl-2 and p53, two well known anti and pro apoptotic proteins respectively.

Both the apoptotic bodies and mitotic figures were observed only in the carcinomas. A variable amount of Bcl-2 was expressed in normal thyroid, multinodular goitres, Hashimoto's thyroiditis, follicular adenomas and thyroid carcinomas. However the expression of Bcl-2 was very high in multinodular goitres, whereas it was significantly low in follicular adenomas.

Nuclear p53 expression was negative in all sections except in undifferentiated carcinomas and the single medullary carcinoma. The previously unreported observation from this

study was the cytoplasmic expression of p53 which appear to be of the wild type in thyrocytes with Hurthle changes.

The results suggest that the dynamic balance that exists between cell proliferation and cell death in normal thyroid is facilitated by the co-expression of Bcl-2 and wild type p53. The sustained expression of Bcl-2 appears to be necessary for the maintenance of thyrocyte function.

The very strong expression of Bcl-2 in multinodular goitres appears to be necessary for the down regulation of cell death by apoptosis and for the compensatory selective hyperplasia of thyrocytes.

The relatively low expression of Bcl-2 in follicular adenoma may be an adaptation to promote apoptosis in order to maintain the neoplasm as benign without proceeding into malignant transformation.

The presence of either apoptotic bodies or mitotic figures is suggestive of malignancy. Expression of Bcl-2 in the carcinomas indicates a better differentiation of malignant neoplasms. Mutation of p53 is not the cause for thyroid carcinogenesis per say.