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EXPRESSION OF APOPTOSIS RELATED MARKERS IN THYROID DISEASE

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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 mechanism is genetically regulated and the affected cell undergoes death at a pre-determined time without causing any harm to neighboring cells.

Thyroid disease is relatively common in Sri Lanka, with multi nodular goitre (MNG) being endemic in some districts. The exact role of apoptosis in thyroid disease has not been established so far. The aim of this study was to find out whether apoptosis or its markers are of diagnostic value in thyroid disease. Two genes, bcl-2 and p53 play a crucial role acting as two proteins on a seesaw, bcl-2 restricting and p53 promoting apoptosis. Bcl-2 allows the cells to survive even in the absence of otherwise essential growth factors by blocking the final common pathway leading to apoptosis. The p53 tumour suppressor gene functions as a transcription factor by binding to DNA and negatively regulating cell division by blocking the cell cycle in G1-S transition and allowing the cells to undergo apoptosis.

The sample of this study consisted of surgically removed thyroid tissues (84 MNG, 51 follicular adenomas, 32 carcinomas and 15 Hashimoto's thyroiditis). The control was histologically normal parts of the same tissues. Serial sections of the routinely processed, formalin fixed, paraffin embedded tissues were taken for Haematoxylin and Eosin staining for morphological estimation of apoptosis and mitotic indices and immunohistochemistry of bcl-2 and p53. The Chi-square test and Spearman rank correlation coefficient was used respectively to evaluate the significance of differences and correlation between categorical variables of the results. The significance level was accepted at $p<0.05$.

Both apoptotic and mitotic figures were present only in the carcinomas. The expression of bcl-2 was very high in MNG and showed a significant difference when compared with the normal (0.006), follicular adenoma (0.01) and Hashimoto's thyroiditis (0.05). When compared with the normal, carcinomas showed significantly high expression (0.002) and follicular adenomas showed significantly low expression (0.04) of bcl-2. All sections were negative for p53, except anaplastic and medullary carcinomas.

The results suggest that the presence of either apoptotic of mitotic figures in a thyroid section is an indication of malignancy. As previously suggested, p53 mutations are not involved in thyroid carcinogenesis. The new finding in this study was the very high levels of bcl-2 expression in MNG. Bcl-2 expression could therefor be used in future research in elucidating the aetiology of MNG.