Epidemiological Study of Goiter in Man and Animals of Iraq

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Goiter  
Hyperplastic goiter  
Cretinism  
Nodular colloid goiter , papillary thyroid cancer, Medullary thyroid : carcinomacore  
Medullary thyroid carcinoma  
Amyloid substance

Abstract:  
Goiter occurred in Iraq . Human cases were recorded in Diwania while animal cases recorded in Mosul area . These cases were diagnosed pathologically and classified depend on gross and microscopical pathological changes . Nodular colloid goiter , papillary thyroid cancer and medullary thyroid carcinoma were present in patients of Diwania while hyperplastic goiter was very common in animals of Mosul . Nodular goiter , grossly thyroid gland appeared nodullated firm or hard in pulpation . Microscopically , the nodules have various sizes of Follicles , some of them were distended with colloid and others were small in size . The nodules were seperated by fibrous connective tissue . Papillary thyroid cancer characterized by enlargment of thyroid gland while microscopically there are many papillary projections tree like pattern ( Papilliform projections to the lumen of follicles ). The medullary cancer of thyroid , grossly tumor distrected to one lobe and there are several foci of haemorrhage and necrosis . Sometimes amyloidic stroma was present .  
The hyperplastic goiter is highly endemic in animals and human of northern of Iraq . Grossly enlargment of thyroid gland ( both lobes ) hyperemic , while microscopically hyperplastic proliferation of epithelial cells to the lumen of follicles . The colloid was scanty and vacuolated.
Introduction

Goiter is recorded all over the world, while endemic goiter is distributed in certain areas of the world that are far away from the sea, far away from salt water and sea food which are rich sources of iodides and isolated valleys with poor soil and high rainfall. It is present in the central and south America, the great lakes region of the United states, In English midlands as Derbyshire and Alpine Europe, Andes mountains. In Asia, as well as Africa such as Atlas mountains, Nile valley, high lands of Kenya, Tanzania, Cameron, Gambia, Congo and Nigeria. In Asia such as Himalayas and Malaysia (Cook, G. 1996).

Cretinism and myxedema: are present wherever endemic goiter is prevalent. Endemic goiter is refers to the high incidence of simple goiter non toxic and generally related to a dietary lack of iodin. Cretinism or dwarfism is a Condition of hypothyroidism characterized by retardation of growth depend on severity of hormone lack. Hypothyroid cretinism is thought to arise from both parents who are goitrous and suffer from Iodin defeciency during late fetal life and the neonatal peroid (Vanderpas 2006).

Myxedema is a term applied to hypothyroidism in the older child or adult. Child that show signs and symptoms between cretin and adult hypothyroidism.

Iodine is necessary for the synthesis of thyroid hormones, when it is not available produce endemic goiter. Certain vegetable, Turnips, Cauliflower, and Cabbage contain goitrogens and their ingestion by persons or by animals with an iodine deficient diet can produce goitrous hypothyroidism (Stanley L.Robbins et al. 1985). Variation in the prevalence of endemic goiter is related also dietary substances such as calicum and Fluorides in the water supply promote goiter formation. Pollution of water supplies with this goitrogenic substances lead to defecient intake of Iodine and then this will decrease synthesis of thyroxine production. Compensatory increase in TSH which is causing follicular cell hypertrophy and hyperplasia. This type of goiter affecting females more than males (Cook, G. 1996).

Non endemic goiter or sporadic simple goiter is much less common and the ratio between females with males 8:1. Especially the simple goiter in females are Appeare first at puberty, the time of increased physiological demand and during pregnancy (Stanley L, Robbins, et al. 1985).

Simple goiter whether diffuse or nodular, firstly being hyperplastic stage then the colloid involution. Grossly the gland is enlarged and exceed to 100-150 gm. Histologically, the follicular epithelium is tall and columnar with newly generated follicles, (Curran, R. 2005).

Nodular simple goiter, non toxic and very common in females more than males (8:1). The diffuse form frequently presents during adolescence and pregnancy. Simple nodular enlargement of thyroid tends to be familial and related genetic disorder (Ramelli, F. 1982, Emanuel Rubin, 2000, Abul, K. Abbas and Andrew, Litchman 2005).

Jones and Hunt, (1996), Van Herle, A. and Utller, R. (1977) worked on papillary adenocarcinoma and noticed nodules 10 cm in diameter which has numerous microscopic foci. 20 – 75 % of this cancer is multifocal in the gland. It is account 80% of this cancer occur under 40 years old.

Emanuel Rubin (2000) and Hazard, J.(1977) write onmedullary thyroid carcinoma, this tumor is derived from the parafollicular or C cells thyroid. The mean age of patients with medullary carcinoma is 50 years and it is 5% of all thyroid cancer.

In our present work, endemic goiter was studie pathologically in human and animals of Mosul area.
Materials and Methods
Samples of enlarged thyroid were collected from diseased animals (still birth), goat, calves, and foals, while biopsy were collected from patients visited the general hospital of Diwania. All samples were fixed in formalin 10% for a week, then one cubic centimeter of each was processed, dehydrated, embedded in wax, trimming, sectioned by microtome, clearing, and finally staining by eosin – hematoxyline.

Results
Grossly, diffuse non toxic goiter of thyroid in animals was enlarged and hypertrophied at the base of the head. Fig. (1).

Fig. (1) : Enlargement of thyroid gland of goat, both lobes.
Fig. (2) : Both lobes are hyperemic with diffuse enlargement.
Fig. 3: Hyperplastic proliferation of epithelial cells to the lumen of follicles, vacuolation in colloid. 25X.

The mean of the weight of the gland 180 - 250 gm and its pulpation was solid hyperemic. Eighteen newly born goats with five calves and one foal were examined and diagnosed in Vet. Hospital Fig. (2).

Microscopically, Diffuse goiter whether endemic or sporadic, at first being hyperplastic stage and secondly the colloid accumulated. It is diffusely symmetrically involved and hyperemic. The follicular epithelium grow as fingers projections to the lumen or folded or grow pilled as layers over each other. The colloid is not uniform throughout the gland some follicles hugely distended and others remain small and the colloid were scanty and vacuolated. Fig. (3).

Cretinism was very prominent in people of Mosul and the percent was 1%.

Multinodular grossly thyroid was enlarged and characterized by irregular nodules while microscopically the follicles appeared filled with colloid islands of hyperplastic acini. Focal hemorrhages and hemosiderin pigmentation. Some areas of calcification.

Fig. (4): The follicles are distended and full with colloid. The epithelial cells are compressed and become cuboidal. Human case. 25X

Papillary carcinoma or papillary adenocarcinoma characterized by lesions was a complicated branching tree-like pattern, papilliform with a central fibro-vascular core. Some papillae were cut in cross section to produce isolated island. Fig. (5).
Fig. (5): Human thyroid slide, papillary thyroid cancer. Papillary form tree-like branches. 25X.

Grossly medullary carcinoma was solid and the cut surface was firm, grayish white. These tumors were discreted in one lobe and there are several foci of hemorrhage with necrosis.

Histologically, medullary carcinoma have polygonal Granular cells that were separated by the presence of stromal amyloid (the nests of tumor cells were embedded in a hyalinized, collagenous framework).

Fig. (6).

Fig. (6): Medullary thyroid carcinoma of human Female, nest of tumor cells full the lumen Of follicles. Amyloid precipitation, pinkish in colour, without cellular structures. 25X.
Discussion

Hypertrophy of thyroid gland and hyperplastic proliferation of epithelial cells occurred as a compensatory increase in TSH, a hormone that stimulates thyroxin production, but the lack of iodine in vegetables and water leads to a decrease in synthesis of thyroxin production (Volpe, R. 1978, Vanderpas, J. 2006).

The prevalence of endemic goiter is related to dietary substances referred to goiterogens such as calcium and fluorides in the water supply promote goiter formation. A number of foods including cabbage, Cassava, cauliflower, Brussels sprouts, Turnip, Brassica and Cruciferae plants are goiterogenic in man and animals (Cook, G. 1996).

The endemic cretinism refers to congenital hypothyroidism that occurs in areas of endemic goiter, both parents are goitrous. Hypothyroid cretinism is thought to arise from iodine deficiency during late fetal life and the neonatal period (Emanuel Rubin, M.D. 2000).

In our present work, endemic hyperplastic goiter and cretinism in Mosul area related to deficiency of iodine in water and vegetable which lead to hyperplastic goiter in animals and endemic cretinism in man. In northern Iraq as general and especially in Mosul area, water and soil naturally polluted with sulfur which prevents absorption of iodine (Stanley, L. Robbins, et al. 1985).

The papillary carcinoma is the most frequent between the age of 20-50 years with a female/male ratio of 3/1. The incidence of this tumor varied from 35%-90% of all thyroid cancers (Emanuel, Rubin 2000). While the medullary thyroid carcinoma represents more than 5% of all thyroid cancers and occurs in sporadic cases. The mean age of patients with this tumor is 50 years (Van Herle and Ulter, R.P. 1977).

References


