Available online at www.scholarsresearchlibrary.com

Scholars Research Library

Scholars Research Library

Annals of Biological Research, 2011, 2 (3) : 242-246
(http://scholarsresearchlibrary.com/archive.html)

Annals of Biological Research
Scholars Research Library

ISSN 0976-1233
CODEN (USA): ABRNBW

Goiter in the sheep slaughtered in Tabriz slaughterhouse, Iran

Shahram Alipourzamani [1], Mohammad Hosein Movassagh*[2] and Mohammad Nouri[3]

[1]Tabriz Branch, Islamic Azad University, Tabriz, Iran
[2]Department of Veterinary Medicine, Shabestar Branch, Islamic Azad University, Shabestar, Iran
[3]Department of Food Animal Medicine, Ahwaz Chamran University, Iran

---

ABSTRACT

Disease of the thyroid gland has been known for thousands of years. Both neoplastic and nonneoplastic diseases affect the thyroid. This is the first report, as far as we are aware, of pathological lesions from the thyroid gland of sheep. The survey was conducted from March 2001 to March 2002.Thyroid glands were collected from 100 sheep during routine slaughter and inspection in Tabriz slaughterhouse, Iran. Thyroid glands were assessed histopathologically. Of all 100 thyroids examined, 33 showed various lesions. Of total samples, 4 (4%) showed colloid goiter, 27 (27%) showed hyperplastic goiter. Of total samples 2(2%) showed lymphocytic (immune-mediated) thyroiditis

Key words: goiter, thyroid gland, histhopathology, sheep.

INTRODUCTION

Thyroid gland releases thyroxin as per demand by altering histological structure depending upon breed, age, sex and season etc. Hypothyroidism is one of the most important condition observed in bovines which is manifested by silent heat, still birth, retained placenta, purulent endometritis [1]. Disease of the thyroid gland has been known for thousands of years. Both neoplastic and nonneoplastic diseases affect the thyroid. Thyroid dysfunction is relatively uncommon in sheep, cattle, and swine. Occasionally a severe iodine deficiency or the excessive ingestion results in the birth of dead or weak young, but thyroid disease in the adult is seldom diagnosed. Sub clinical hypothyroidism has been suggested as a factor in decreased libido in the male and silent estrus in the female [2]. Adequate iodine intake by pregnant animals is essential to enable their offspring to produce sufficient thyroid hormone for development and growth, and to survive after birth. Extreme iodine deficiency results in decreased thyroid hormone production by the thyroid gland

which responds by increasing in size to produce goiter. Sheep and cattle require a diet containing 0.5 mg iodine/kg DM. Diets containing less than 0.2 mg/kg DM produce goiter in lambs. The few Victorian pasture samples analyzed for iodine have ranged from 0.1 to 0.5 mg/kg DM. [3].

Goitrogens in plants affect the iodine requirements of livestock by interfering with iodine up-take by the thyroid gland or inhibiting synthesis of thyroxin. The most common goitrogen is thiocyanate, derived from both the cyanide in white clover and the glucosinolates in brassica fodder crops [4].

Colloid goiter is characterized by the presence of a large soft thyroid gland with its glandular space distended with colloid. Most cases occur in neonatal lambs, calves and kids which show a high rate of stillbirths and weakness and a high mortality rate. Enlarged thyroid glands and alopecia are good indicants of the existence of a nutritional deficiency of iodine, the usual cause of goiter in animals [4].

Diffuse hyperplasia (hyperplastic goiter) is the standard response to dietary iodine deficiency and to poisoning by plant goitrogens. It may also be caused by persistent exposure of the fetus to a high iodine intake of the dam. Neonates are the usual subjects and the disease is manifested by clinical goiter, often sufficient to cause dystocia, and weak neonates with a high rate of stillbirths and deaths soon after birth [4].

The aim of this study was to determine thyroid gland lesions in sheep slaughtered in Tabriz slaughterhouse in north-west region of Iran.

MATERIALS AND METHODS

The thyroid gland lesions were investigated pathologically in the water sheep slaughtered in Tabriz slaughterhouse, Iran. The survey was conducted from March 2001 to March 2002. Thyroid glands were collected from 100 sheep (systematic random sampling) during routine slaughter and inspection. For histopathological examination, all samples were fixed in 10 per cent formaldehyde buffer solution, processed routinely, and paraffin-wax embedded and sectioned at 5 micrometer. Sections were stained with Hematoxylin and Eosin stains.

RESULTS

Of all 100 thyroids examined, 33 showed various abnormal histomorphology (Table 1).Of total samples, 4 (4%) showed colloid goiter (Fig 1), 27 (27%) showed hyperplastic goiter (Fig 2). Of total samples 2(2%) showed lymphocytic (immune-mediated) thyroiditis (Fig 3).

Table 1.Thyroid lesions seen in the sheep slaughtered in Tabriz slaughterhouse, Iran

Goiter		Lymphocytic Thyroiditis
31 (31%)		2 (2%)
Simple Colloid Goiter	Hyperplastic Goiter	
4 (4%)	27 (27%)	

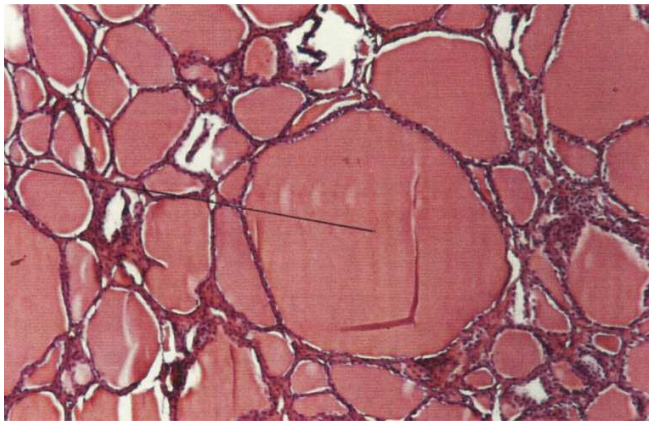

FIG 1: Photomicrograph of the thyroid gland of the sheep, showing colloid goiter, see enlargement and distention of the acinius which are filled with colloid. (×10 H&E)

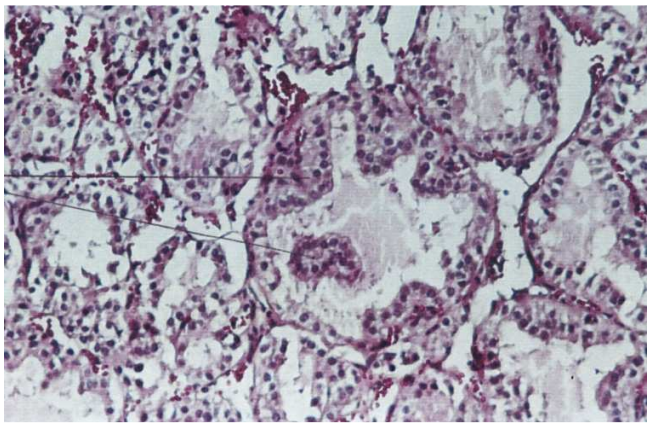

FIG 2: Photomicrograph of the thyroid gland of the sheep, showing hyperplastic goiter, the follicle is lined with tall columnar epithelium which forms papillary projection into the lumen. Colloid is often absent. (× 40 H&E)

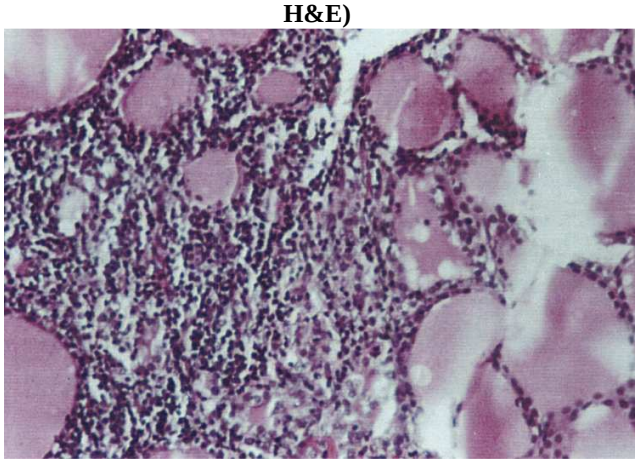

FIG 3: Photomicrograph of the lymphocytic thyroiditis in the sheep. (× 40 H&E)

DISCUSSION

Thyroid dysfunction is relatively uncommon in the ruminants. In the present survey, of all 100 sheep thyroids examined, 33 (33%) showed goiter which is nonneoplastic and noninflamatory enlargement of the thyroid gland develops in all domestic mammals , birds , and other sub mammalian vertebrates. Colloid goiter is characterized by enlargement and distentions of the acini, which are filled with colloid .The walls, are stretched and the epithelium flattened. Although the colloid is abundant, it may stain weakly and unevenly. It contains little iodine and little thyroxin, and any symptoms are those of hypothyroidism. Frequently, there are no symptoms beyond the increased size of the gland [5].

Detection of an enlarged thyroid gland, and a ratio of thyroid weight to body weight greater than 0.4 g/kg, provides an indication of goiter in lambs and kids. Microscopic study of the thyroid is used to confirm the type of goiter present [6].

Dietary iodine deficiency that resulted in diffuse thyroid hyperplasia was common in many areas of the world before the widespread addition of iodized salt to animal diets. Iodine-deficient goiter still occurs worldwide in domestic animals, but cases are sporadic and few animals are affected (3).Of total samples, 4 (4%) showed colloid goiter which represents the evolutionary phase of diffuse hyperplastic goiter in young adult and adult animals. Colloid goiter may develop either after sufficient amounts of iodide have been added to the diet or after the requirements for thyroid hormones have diminished in an older animal. The previous studies on the thyroid gland lesions in cattle, sheep and goat have shown 16.5%, 12% and 11% colloid goiter respectively in Ahwaz slaughterhouse South-west of Iran [7, 8]. Of total samples , 27(27%) showed hyperplastic goiter which is reported for the first time in the sheep as far as we are aware , and the previous studies on the thyroid gland lesions in sheep and goat have shown 42% and 47% hyperplastic goiter respectively in Ahwaz slaughterhouse, South-west of Iran [9]. Microscopically the follicles are lined with tall columnar epithelium which forms papillary projections into the lumens. Colloid is scant and often absent. The follicular cells had become tall columnar with abundant cytoplasm. Hyperplasia of these cells causes them to fold inward, into a papillary arrangement, eventually obliterating most or all of the colloid. Hyperplasia is the first morphologic response to iodine deficiency [9].

Affected lambs and kids by iodine deficiency may be treated with thyroxin preparations or thyroid tablets, drenched with 20 mg of potassium iodide, or injected with 1 ml of an iodized oil preparation [10].

In the present survey of total samples, 2 (2%) showed lymphocytic (immune-mediated) thyroiditis. The lesions were only multifocal and showed early stage without any replacement by fibrous tissue. The presence of lymphoid cells in the substance of the thyroid parenchyma probably always reflects an abnormal immunologic state [11]. This is the first report of the presence of lymphocytic (immune-mediated) thyroiditis in the small ruminants especially in sheep as far as we are aware.

In animals, only in dogs of the Beagle breed, lymphocytic thyroiditis remarkably similar to Hashimoto's disease of human is frequently encountered [12]. Although the exact pathogenetic

mechanism in the dog is not completely established, evidence suggests a polygenic pattern of inheritance similar to that observed in human beings [13]. It can be concluded from the results presented here that the thyroid disorders are common in sheep because no one in Iran use iodized salt for the sheep.

REFERENCES

[1] V. M. shelke, V.P. Pathak, D. K. Bedre ,J. M. Patil, C. S. Mote, *World Veterinary*, **2009**, 2, 10, 387-389.
[2] Swenso , **1996**. 640-645.
[3] R.W. Mason, *British Veterinary Journal*, **1976**, 132, 374.
[4] C.J. McCaughan, K.W., Laurie, M.C. Martin, M.W. Hooper, *Australian Veterinary Journal*, **1984**, 61, 200-201.
[5] T.C. Jones, R.D. Hunt, **1983**, 1597-1614.
[6] L.W. Caple, K.K. Azuolas, G.F. Nugent, H.R. Corbett, (Text of poster presented at the Australian Veterinary Association, Victorian Division, Annual Meeting, March **1983**).
[7] William , Carlton , W. Donal, M. Mcgavin, **1995**, 260-26.
[8] K. Mardomi, D.V.M, thesis, **1993**.
[9] H. Mandavi, D.V.M, thesis, **1993**.
[10] L.W. Caple, K.A. Andrewartha, G.F. Nugent, Victorian Veterinary Proceedings, **1980**, 38, 43-44.
[11] A.V. Livolsi, **1990**, 68-97.
[12] J T.C. Ones, R.D. Hunt, **1983**, 1597-1614.
[13] C.C. Capen, **1993**, 311-313.