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Lymphocytic thyroiditis at university college hospital, Ibadan, Nigeria- a prospective post-mortem study

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Abstract

Background: This prospective study was carried out in the Department of Pathology, University College Hospital, Ibadan, Nigeria between December 2008 and April 2010 with an aim to determine the frequency of lymphocytic thyroiditis at autopsy. **Method:** Haematoxylin and eosin stained slides of thyroid glands from 107 individuals (65 males and 42 females) who died from non-thyroid related diseases were reviewed and categorised using Williams and Doniach's criteria. **Results:** Lymphocytic infiltration occurred in ten (9.3%) cases, including 8 males and 2 females. The inflammation was Grade 1 in seven cases, Grade 2 in two cases and Grade 3 in one case (Hashimoto thyroiditis). Moderate and severe grades of inflammation were restricted to subjects aged 40 years and above (p = 0.01) and were only observed in patients who died either from infective illnesses or unnatural/violent causes. **Conclusion:** The results of this study suggest that the prevalence of thyroiditis in Ibadan has remained relatively constant in the last two decades. It is suggested that prevalence of marker of subclinical autoimmune disease, which thyroiditis represents, has not increased in Ibadan over the last two decades. The results of this study suggest that the prevalence of thyroiditis in Ibadan has remained relatively constant in the last two decades. It is suggested that prevalence of marker of subclinical autoimmune disease, which thyroiditis represents, has not increased in Ibadan over the last two decades.

Keywords: Thyroiditis, Autopsy, Pathology, Ibadan.

INTRODUCTION

Focal collections of lymphocytes are seen at autopsy in the thyroid gland of about one-half of females and one quarter of males in Caucasians and this finding possibly represents a subclinical manifestation of focal lymphocytic thyroiditis, which is presumed to be an autoimmune disorder [1].

There is paucity of clinical studies on the frequency of lymphocytic infiltration of the thyroid gland in Nigerian patients without clinical thyroid disease. Earlier reports on the frequency of thyroiditis, suggested that the frequency of thyroiditis was much lower in Africans than in Caucasians [2]. In a retrospective review of thyroid surgical specimens, Ogunniyi and Junaid observed that 11% of 200 cases had parenchymal lymphocytic infiltration, compared to a frequency of less than 1% in an earlier study from the same centre, suggesting that the frequency of thyroiditis was increasing [3].

From a review of the English literature, there has not been any autopsy study on lymphocytic thyroiditis in Nigeria. This prospective autopsy study was undertaken to determine the frequency of thyroid lymphocytic infiltration at autopsy in patients without any clinical evidence of thyroid disease treated at the University College Hospital, Ibadan.

MATERIALS AND METHODS

This was a prospective post-mortem study of thyroid glands obtained from individuals who died from non-thyroid related diseases at a University Hospital in South Western Nigeria between December 2008 and April 2010. In individual cases, the gland was removed intact, cleaned of any non-thyroid tissue, weighed and fixed in 10% neutral buffered formalin.

The patients' clinical case notes were consulted for details of the patients' age, sex and clinical diagnosis. Each thyroid gland was sliced coronally into 3 to 4 millimetre thick sections. Alternate sections were processed for histology, except for large glands, where no more than 12 blocks were selected.

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The paraffin-embedded sections were stained with haematoxylin and eosin and were systematically examined for focal lymphocytic thyroiditis, using Williams and Doniach's criteria[4], which was graded on a three-point scale, as follows:

Grade one- small foci present on one or two blocks;

Grade two- small foci present on all or most blocks;

Grade three- large foci present on all or most blocks.

Continuous variables of the data obtained were analysed using the student's t test, while discontinuous variables were analysed using the chi-squared test, with the level of statistical significance set at $p \leq 0.05$.

Inclusion criteria

All the thyroid glands of patients who died of non-thyroid related diseases, whose relatives consented to autopsy, were included in the proposed study population.

Exclusion criteria

Thyroid glands of patients who died of thyroid related diseases and also those whose relatives decline autopsy.

RESULTS

Age and sex distribution

One hundred and seven patients were recruited into the study during the seventeen months duration of the study, comprising 65 males and 42 females.

The ages of the patients ranged from 5 to 75 years, with a mean age of 41 ± 17.9 years. The mean age of the females (38 ± 15.2 years) was not significantly different from that of the males (42.9 ± 19.3 years), t = 1.4, degrees of freedom (df) = 105, p = 0.17.

Lymphocytic infiltration

Lymphocytic infiltration was observed in ten (9.3%) of the 107 cases. Eight of the ten patients with lymphocytic infiltration were males and two were females. Thus, the relative percentage frequency in males was 12.3% and in females was 4.7%.

The mean age of the ten patients with thyroiditis (33.9 ± 19.7 years) was not significantly different from that of the 97 patients without thyroiditis (41.7 ± 17.6 years), t = 1.3, df = 105, p = 0.2.

The inflammation was mild (Grade 1) in seven cases, moderate (Grade 2) in two cases and severe (Grade 3) in one case. Figures 1, 2 and 3 show representative photomicrographs from three cases showing mild, moderate and severe thyroiditis, respectively. Table 1 summarises the clinical and pathological data on the ten cases with thyroiditis.

There was no obvious correlation between sex and grade of lymphocytic infiltration ($\chi^2 = 4.8$, df = 3, p = 0.2).

Six of the seven patients with mild inflammation were less than 40 years of age, while all the three patients with moderate or severe inflammation were aged 40 years and above. This was statistically significant ($\chi^2 = 6.4$, df = 1, p = 0.01).

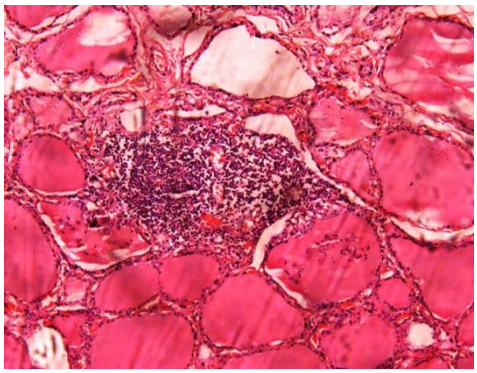

Figure 1: Photomicrograph showing mild lymphocytic infiltration (Grade 1) in the thyroid of a 40 year old road traffic accident victim (Haematoxylin and eosin, X100)

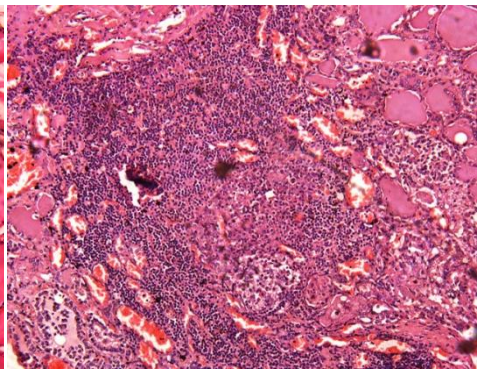

Figure 2: Photomicrograph showing moderate lymphocytic infiltration (Grade 2) in the thyroid of a 42 year old male gunshot victim (Haematoxylin and eosin, X100)

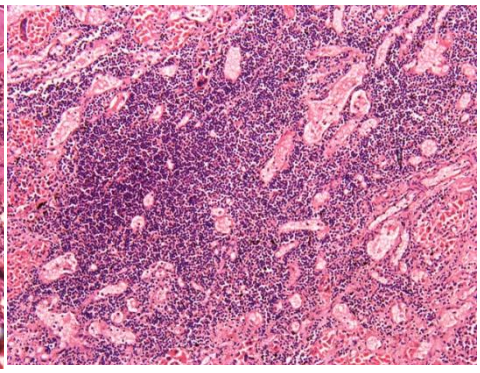

Figure 3: Photomicrograph showing severe lymphocytic infiltration (Grade 3) in the thyroid of a 55-year-old woman with Hashimoto's thyroiditis. The image shows diffuse lymphocytic infiltration with destruction of thyroid follicles (Haematoxylin and eosin, X100)

Clinical diagnoses

The commonest categories of death in the study population were unnatural and violent deaths which accounted for thirty (28%) of the cases (Table 1). They included cases of road traffic accident, assault, suicide and gunshot injuries. Eight of these patients were brought in dead.

The second most common category of death was infection which accounted for twenty-nine cases (27.1%), including tuberculosis, typhoid, encephalitis, malaria, meningitis, amoebic liver abscess and cholera in descending order of frequency.

Other medical conditions accounted for twenty-nine cases (27.1%) including cardiovascular disease, renal failure and diabetes mellitus.

Twelve cases (11.2%) had associated malignancies, including prostatic, ovarian, pancreatic cancers and lymphomas.

The remaining seven cases (6.5%) recruited were obstetric deaths including two cases each of eclampsia and intrauterine foetal death and a case each of post-partum haemorrhage, prolonged labour and amniotic fluid embolism. There were no significant correlation between categories of death in males and females, except in maternal death (P=0.001, Table 1)

Significant lymphocytic infiltration was only observed in patients who died from infective illnesses or unnatural or violent causes, as shown in Table 2 ($\chi^2 = 8.97$, df = 1, p = 0.003). There was no significant correlation between category of death and severity of inflammation (P values all > 0.05, table 2). The clinical and pathological bio data of the ten patients with thyroiditis is summarised in Table 3.

Table 1: Causes of death in the study population

Categories of Death	Female	Male	Total	%	OR (95%CI)	P Value
Unnatural/violent deaths	8	22	30	28	0.49(0.19-1.25)	0.095
Infections	12	17	29	27.1	1.3(0.47-2.69)	0.476
Other medical conditions	10	19	29	27.1	0.76(0.31-1.8)	0.350
Malignancies	5	7	12	11.2	1.12 (0.28-4.33)	0.545
Obstetric deaths	7	0	7	6.5		0.001
Total	42	65	107	100	-	-

Table 2: Correlation of severity of inflammation with disease categories

Categories of Death	Severity of Inflammation				Total	
	Absent	Mild (Grade 1)	Moderate (Grade 2)	Severe (Grade 3)		P-value
Unnatural/violent deaths	26	1	2	1	30	0.276
P Is there a correlation between	23	6	0	0	29	0.765
Other medical conditions	29	0	0	0	29	0.704
Malignancies	12	0	0	0	12	0.878
Obstetric deaths	7	0	0	0	7	0.929
Total	97	7	2	1	107	

Table 3: Summary of clinical and pathological bio data of ten patients with lymphocytic infiltrates in the thyroid

Age (years)	Sex	Diagnosis	Degree Of Inflammation	Other Significant Findings
55	Female	Road traffic accident with severe head injury	Severe (Grade 3)	Hashimoto's thyroiditis
40	Male	Road traffic accident with severe head injury	Moderate (Grade 2)	Colloid goitre
42	Male	Gunshot injury to the abdomen	Moderate (Grade 2)	
10	Male	Non-Hodgkin's lymphoma (lymphoblastic lymphoma)	Mild (Grade 1)	
72	Male	Haemorrhagic gastroenteropathy with perforated jejunal ulcers and peritonitis	Mild (Grade 1)	Colloid goitre
18	Male	Assault	Mild (Grade 1)	
24	Female	Bronchopneumonia in pregnancy	Mild (Grade 1)	
33	Male	Liver cirrhosis with bronchopneumonia	Mild (Grade 1)	Micropapillary carcinoma
10	Male	Bronchopneumonia	Mild (Grade 1)	
35	Male	Pulmonary tuberculosis	Mild (Grade 1)	Micropapillary carcinoma

DISCUSSION

In the present post-mortem study, 9.3% of 107 cases had lymphocytic infiltration of the thyroid. In a previous autopsy study from this environment in 1968, Taylor reported 0.19% cases out of 1081 thyroids showing features of thyroiditis[5]. This would ordinarily suggest an increased prevalence of thyroiditis in Ibadan. On the other hand, since that study was not specifically designed to identify thyroiditis in each case, this figure could partly be due to under reporting. In post-mortem cases displayed focal thyroiditis, which is comparable to our finding.

In surgical biopsy studies, similar low frequencies have been reported by Anidi and co-workers in Enugu, Eastern Nigeria who noted only one case of thyroiditis from 372 cases of goitres[6] . In addition, similar low figures have been reported by Kennedy (1970) in a Nairobi, Kenya study, which observed thyroiditis in only 5% of 201 thyroidectomy specimens [7].

Ogunniyi and Junaid in 1988, observed thyroiditis in 11% from 217 surgical pathology cases and had suggested that there was an increasing incidence of thyroiditis in the Ibadan population[3]. However, it should be noted that the study, the result of which was based on surgical biopsy specimens, could have been influenced by other diseases of the thyroid.

Comparison of result of such study with the present and previous autopsy-based studies may not be valid and may therefore explain variation in incidence reported.

In contrast to the low figures reported among black Africans and Jamaicans, much higher figures of thyroiditis from thyroidectomy biopsies, ranging from 56% to 73%, have been reported among Caucasians[7].

In the present study, males were more commonly affected than females, with relative frequencies of 12.3% for males and 4.7% for females but this was not statistically significant and is probably explained by the fact that there were more males recruited in the study. It is noteworthy though that in the previous Ibadan study of Ogunniyi and Junaid, the relative frequency of thyroiditis was also higher in males (14.3%) than in females (10.6%)[3]. In contrast to the findings from Ibadan, Caucasian studies have documented higher relative frequencies in females (ranging from 36-54%), than in males (ranging from 18-24%) [1,4,8].

In contrast to the Ogunniyi study that showed a proportionately higher incidence of severe lymphocytic thyroiditis, the lymphocytic infiltration in the present study was mild in seven cases, moderate in two cases and severe in one case, which had Hashimoto's thyroiditis. Again, the higher figures obtained in that study from this same centre can possibly be explained by the fact that their study was based on an analysis of surgical pathology diseased thyroids, whereas the present post-mortem study was specifically based on subjects without a prior history of thyroid disease [3].

Lymphocytic thyroiditis which was observed in the present study to be mild in patients less than 40 years and moderate to severe in those 40 years and above has not been previously reported in a local study. In a comparative post-mortem study of Japanese and British subjects, Okayasu et al observed that whereas thyroiditis in British female subjects showed an age-related increase in the incidence and severity, there was no age-related increase in their Japanese counterparts [9]. Harris et al also noted an increase in the incidence of focal thyroiditis with ageing among British subjects[10]. It is therefore likely that racial factors may play a role in the occurrence of lymphocytic thyroiditis[11]. In the present study, viral and chemical mediators may have been implicated in lymphocytic infiltration which was only observed in patients who died from infective illnesses or from unnatural or violent causes. Thyroiditis as a complication of infective disorders might be explained by the systemic release of cytokines and other inflammatory mediators, but it is more difficult to explain the occurrence of thyroiditis in sudden violent deaths.

CONCLUSION

In conclusion, the present study has documented a 9.3% prevalence of thyroiditis at autopsy in Ibadan, as compared to the prevalence of 11% documented in the earlier surgical pathology study and has shown an age-related increase in the severity of lymphocytic thyroiditis in Ibadan. Lymphocytic thyroiditis was also noted to be significantly associated with infections and trauma. It would appear that autoimmune thyroiditis is relatively infrequent in this environment occurring in only 0.9% of cases but we recommend that early post-mortem examinations should be carried out in all cases to allow genetic studies to be performed when indicated.

Conflicts of interests

All authors have no conflict of interests.

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