

THYROID DISEASE IN AFRICANS AND INDIANS

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In the 5-year period, 1955 - 1959, 218 patients with thyroid disease were seen at King Edward VIII Hospital, Durban. A review of these cases indicates the pattern of the disease in the two racial groups seen in this hospital, and in particular the frequency of the more severe forms of thyroid disease, namely thyrotoxicosis and malignancy.

MATERIAL

The 218 patients include 125 Africans and 93 Indians, giving a hospital incidence of 0.07% and 0.25% respectively.

Sex. The sex ratio in Africans was 12.8 females to 1 male (116:9), and in Indians 6.2:1 (80:13).

Age. In both Indians and Africans the decade, 25 - 34 years of age, had the highest incidence of thyroid dis-

orders, with only slightly fewer in the decades 15 - 24 years and 35 - 44 years (Figs. 1 and 2).

Satisfactory histopathological diagnosis was obtained in 150 of the 218 cases, and firm clinical diagnosis alone

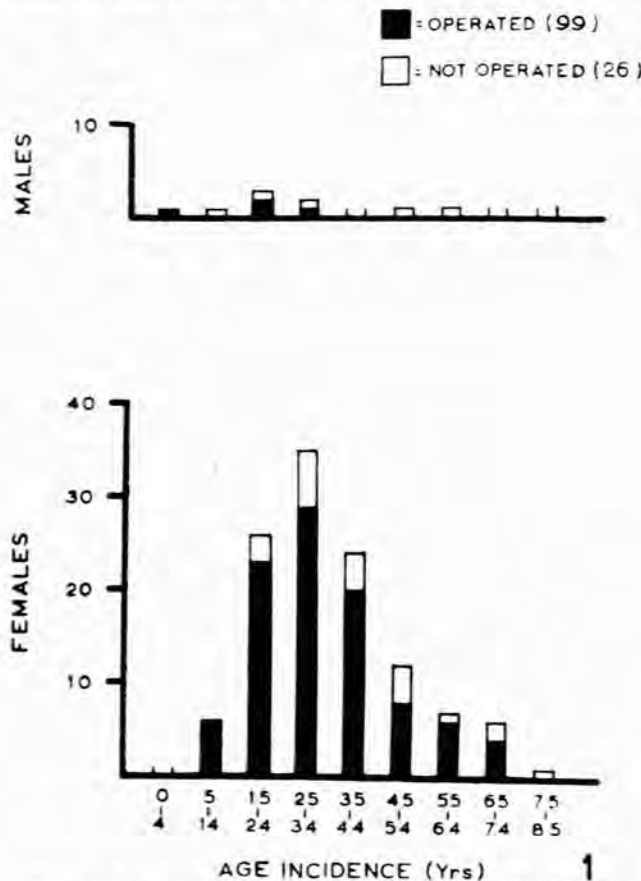


Fig. 1. Age incidence of thyroid disease in 125 African patients.

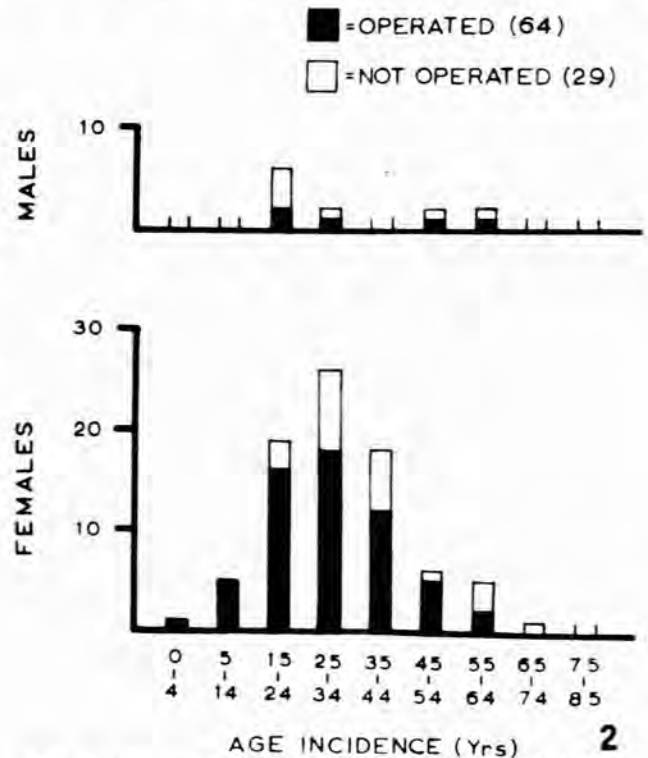


Fig. 2. Age incidence of thyroid disease in 93 Indian patients.

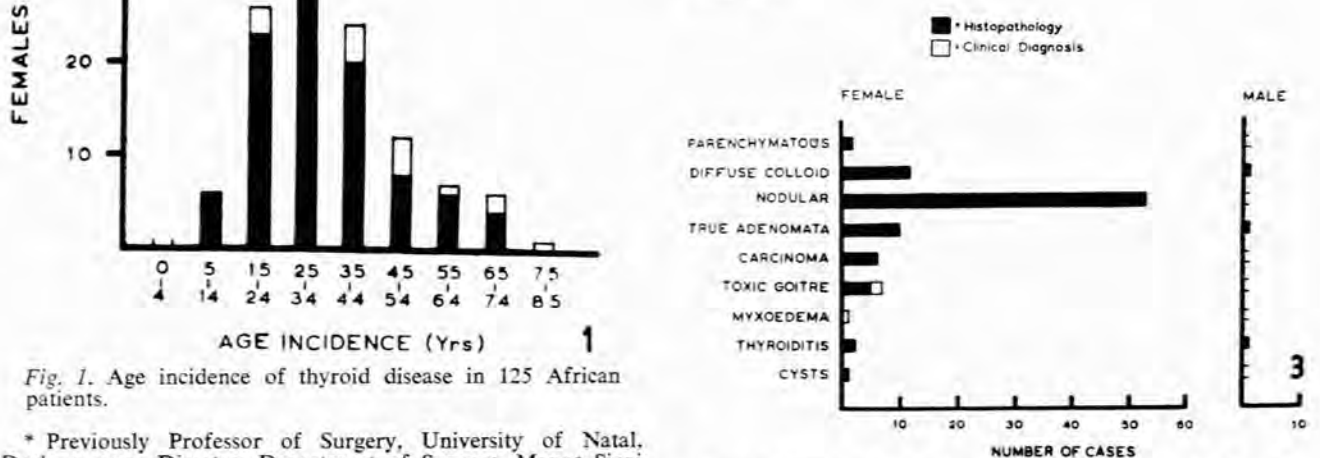


Fig. 3. Histopathological and clinical diagnosis in thyroid disease in the African patients.

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in a further 15. Included in these are 5 cases with a necropsy or biopsy diagnosis. In the remaining 53 cases a clinical diagnosis of thyroid pathology was made; operation was carried out in 18 of this group, but no histology is available.

True adenomata were so classified when the histopathological picture presented as a well-circumscribed and encapsulated nodule, and when the histology showed

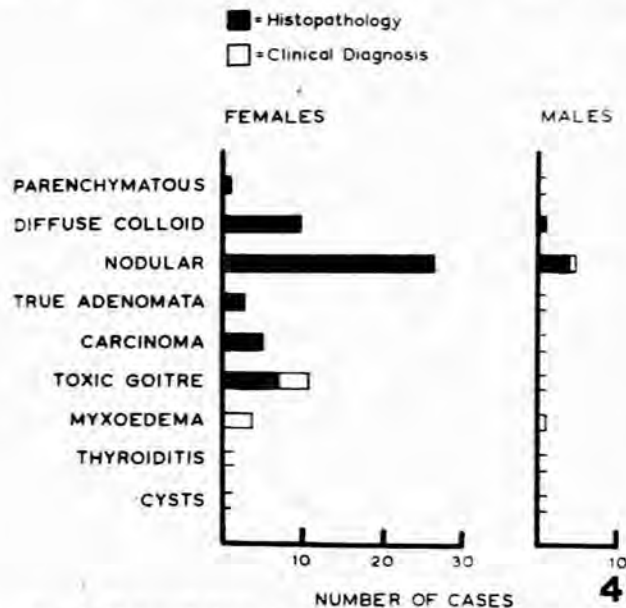


Fig. 4. Histopathological and clinical diagnosis in thyroid disease in the Indian patients.

structural changes different to the remainder of the gland (Table I, Figs. 3 and 4).

OPERATIVE TREATMENT AND COMPLICATIONS

The operations totalled 163 (Table II), one group of 93 in the Professorial Unit, and a group of 70 in other

TABLE I. DISTRIBUTION OF THYROID PATHOLOGY IN 165 CASES

	African		Indian	
	Female	Male	Female	Male
1. Non-toxic thyroid enlargement:				
Parenchymatous	2	—	1	—
Colloid	12	1	10	1
Nodular	54	—	27	5
2. True adenomata	10	1	3	—
3. Carcinoma	6	—	5	—
4. Toxic thyroid enlargement	7	—	11	—
5. Myxoedema	1	—	4	—
6. Thyroiditis:				
Hashimoto's	—	—	—	—
Riedl's	—	—	—	—
Acute purulent	2	1	—	—
7. Thyroid cyst	1	—	—	—

surgical firms. There were 2 deaths, none in the first group. One patient, an African woman of 37 years, had a subtotal thyroidectomy for a nodular goitre and died 11 days later from suppurative bronchopneumonia, demonstrated at autopsy. The other, an African woman of 59,

TABLE II. OPERATIVE TREATMENT

Pathology	African	Indian
Parenchymatous	2	1
Colloid	13	11
Nodular	54	31
True adenoma	11	3
Carcinoma	2	5
Toxicity	4	7
Cysts	1	—
No histology	12	6

had a subtotal thyroidectomy which was followed the same day by respiratory obstruction. An immediate tracheostomy was done, but the patient died on the fourth day. Autopsy showed gross pyelonephritis, atelectasis and glottic oedema.

Wound infections occurred in 20 patients (12%). These were usually minor, in the form of a stitch abscess, but in at least 2 patients major disruptions occurred. Haematomas or serous collections, either localized or involving the length of the incision, occurred in 15 patients (9%).

Recurrent nerve injury occurred in 3 of the second group of 70 patients who had operations. One occurred after a total thyroidectomy and another after total hemithyroidectomy. The lesions were unilateral and persisted until discharge from hospital. One nerve in each of 2 patients was injured in the first group of 93 patients, where both nerves are displayed as a routine at operation and immediate postoperative laryngoscopy is part of the procedure. Riddell³ has pointed out the need for expressing nerve injury not in terms of number of operations, but of the number of nerves at risk; his series revealed 2.1% of nerves at risk injured when the nerves were identified, and 3.5% in an equal number of patients when no identification was made. Hawe and Lothian⁵ reported 2.8% of nerve injuries in 1,011 patients with nerve identification, whereas Till¹¹ reported an injury rate of 10% (5.6% of nerves at risk). In the series of 93 cases here reported, 154 nerves were at risk, and the nerve damage was therefore 1.4%. Tetany was clinically apparent in 3 of the group of 93 patients. Two Indian women showed obvious signs, one following a total thyroidectomy for adenocarcinoma, and the other following a subtotal thyroidectomy for a large colloid goitre. The third, an African woman, had a very vascular nodular goitre extending retrosternally. Only the patient with carcinoma had persistent symptoms of tetany which required treatment.

DISCUSSION

The majority of patients seen at the hospital are drawn from Durban and its peri-urban areas; a number come from outlying districts and some from recognized endemic goitre areas in Natal.

The relatively low incidence of goitre among Africans is in all probability a reflection of the smaller number of Africans, proportionately, who come to hospital for painless swelling of the neck. Not uncommonly, young women with colloid or nodular goitre provide a history of one or more siblings at home similarly affected.

The majority of Indian patients with thyroid disease are from the Durban area or the coastal belt of the North Coast extending about 50 miles north and 20 miles inland.

In both racial groups, but particularly among Africans, men very seldom suffer from thyroid disease, and no cases of carcinoma or toxicity were seen in males.

Nodular Goitre

Nodular goitre is the commonest clinical manifestation, and the reasons for seeking medical help are usually swallowing or breathing difficulty. Many patients complain mainly of increasing swelling or recent increase in size, and X-ray shows considerable tracheal compression in many patients.

Retrosternal extension is surprisingly rare despite X-ray and operative search. In the only patient with such extension there was an entirely separate retrosternal nodule, 1 inch by 2 inches, with no connection other than fibrous tissue existing between it and the main nodular thyroid enlargement.

Thyrotoxicosis

There is no doubt that thyrotoxicosis is rare in Africans and only 7 cases have been seen in the 5-year period (Table III). The incidence is therefore 5.6% of all African thyroid admissions and 6% of the female thyroid admissions. In 2 cases the toxicity supervened on a multinodular

TABLE III. TOXIC AND MALIGNANT CHANGE

		Primary	Following nodular goitre	Total		
Toxicity	African	5	2	7	% of hospital admissions	5.6%
	Indian	8	3	11		
Carcinoma	African	2	4	6	% of operated cases	6.0%
	Indian	2	3	5		

goitre, but in 3 of the remainder the appearance was that of typical Grave's disease—a diffusely enlarged vascular gland. Of the 7 patients, 4 underwent subtotal thyroidectomy, 2 were treated medically, and 1 died in hospital without operation shortly after admission (Table IV).

TABLE IV. THYROTOXICOSIS IN AFRICAN PATIENTS (1955-1959)

Age (years)	Thyroid gland
36	Multinodular
38	Diffuse enlargement
30	Multinodular
40	Diffuse enlargement
25	Necropsy—death from thyrotoxic myocarditis
43	Diffuse
17	? Diffuse

} Subtotal thyroidectomy; histologically confirmed
} Clinical diagnosis of toxic goitre—treated medically

Eleven Indian patients with thyrotoxicosis were seen, all women, a hospital incidence of 12% of thyroid disease and 13.7% of female thyroid admissions. Seven patients were operated on, the remaining 4 declining surgical treatment and being treated medically. Two women were 57 and 74 years old respectively, the 74-year-old patient being in cardiac failure. The remainder were 40 years and under, and 1 of these had a nodular goitre. Three of the 11 patients had nodular goitres, the remaining 8 presenting as primary thyrotoxicosis.

The figures presented in this series must be considered in the light of the relatively few African patients who come for treatment from endemic goitrous areas in Natal. The majority of these women do not attend if the only complaint is a cosmetic one. It is more probable that the patients with toxicity do come to hospital, and therefore the incidence of toxicity is, in all probability, artificially considerably higher in this hospital series than in others.

The same comments apply in lesser degree to Indian patients. The majority of these patients do come to hospital, even if only for reasons of deformity, and the figure of 12% incidence of toxicity is therefore a truer reflection.

Carcinoma

The incidence of carcinoma expressed as a proportion of thyroidectomies was 6.0% in Africans and 7.9% in Indians (6 of 99 and 5 of 64 cases respectively). All the patients were adult women with the exception of a young Indian girl (Table V).

In 4 of the 6 African women the carcinoma developed

TABLE V. THYROID CARCINOMA IN AFRICANS AND INDIANS

	Age (years)	Length of history	Mass	Signs and symptoms	Treatment	Histology	Result
Africans:							
1.	72	5 years	Right lobe	Trachea compressed—1 cord paralysed	Thyroidectomy	Follicular adenocarcinoma	Discharged
2.	36	?	?	Paraplegia 1 month	Biopsy of vertebra	Functioning thyroid tissue	—
3.	69	20 years	Both lobes	Tracheal compression	Biopsy—no operation	Giant-cell carcinoma	Died—secondary in lungs
4.	85	1 year	Both lobes	Tracheal compression	No operation	Spindle-cell carcinoma	Died in hospital
5.	34	1 month	Both lobes	Mass in neck	Thyroidectomy	Papillary adenocarcinoma	Discharged
6.	60	8 months	Both lobes	Tracheal displacement	Node biopsy	Follicular adenocarcinoma	Discharged
Indians:							
1.	29	2 months	Left lobe	Mass in neck	Thyroidectomy	Papillary adenocarcinoma	Well 3 years later. Tetany
2.	46	22 years	Both lobes	Tracheal compression	Thyroidectomy	Follicular adenocarcinoma	Discharged. Cord lesion
3.	38	12 years	Right lobe	Mass, and secondary in skull	Thyroidectomy	Follicular adenocarcinoma	Discharged
4.	20	3 years	Both lobes	Tracheal displacement	Thyroidectomy	Follicular adenocarcinoma	Discharged
5.	5	2 years	Right lobe	Mass	Thyroidectomy	Papillary adenocarcinoma	Discharged

in a thyroid which was the seat of long-standing disease involving both lobes in 3 cases (Table V); another patient being admitted for paraplegia following secondary spread to a vertebra, and not for the thyroid swelling. In 1 other case the history of a mass was short. Two of these 6 were in younger age groups (36 and 34 years), while the remainder were in people over 60 years. Three were well-differentiated tumours (2 in old people and 1 in a younger woman), 2 were poorly differentiated (both in older

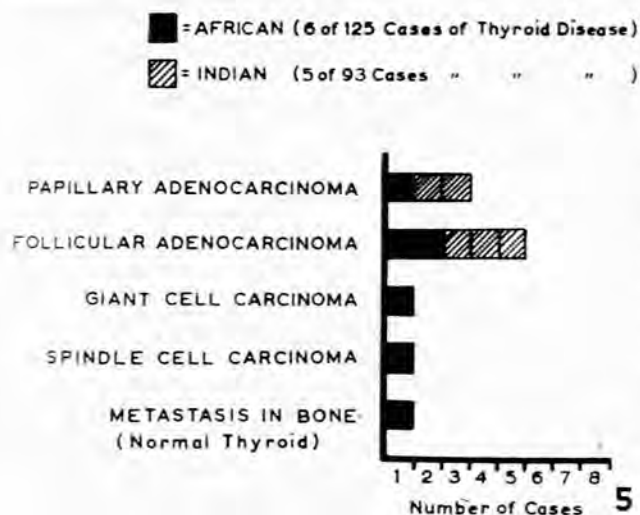


Fig. 5. Analysis of findings in the patients with thyroid carcinoma.

people), and in 1 case biopsy of the vertebra showed an area of functioning thyroid tissue (Fig. 5).

Of the 5 Indian females with carcinoma, 3 had a long history of thyroid enlargement; 1 only, a young woman of 29 years, having a history of a rapidly growing lump of 2 months' duration. So rapid was the growth that it had been incised as an abscess elsewhere. In 4 cases the women were young or middle-aged, and all had well-differentiated growths. The only child with the disease, an Indian girl of 5 years, had a single nodule removed 2 years previously which, histologically, was a papillary adenocarcinoma. Her parents refused further treatment, but 2 years later she was re-admitted and a total thyroidectomy was performed.

Postoperative follow-up has proved difficult in these patients, and only 1 Indian woman of 29 years, with a papillary adenocarcinoma, is regularly seen and is well 3 years after operation.

The incidence of thyroid carcinoma varies widely in the literature. The figures for all thyroidectomy cases in Hudson's series was 2.6%⁶ and in Cattell and Colcock's series 5.3%.¹ The incidence of carcinoma supervening on multinodular goitre varies more widely. Pemberton and Black,⁷ citing the extensive experience of the Mayo Clinic, found 3.8% of multinodular non-toxic goitres to have carcinoma on section—in these there was no previous clinical suspicion. Other reports give the following figures: 4.7%,⁶ 7.2%,⁸ 9.1%,¹ 20%,¹⁰ and 60%.⁴ The incidence in the single nodule is generally regarded as

greater than in multinodular goitres. One major difficulty in assessing this incidence is that there is so frequently disagreement among several observers whether a thyroid gland has one or more nodules. Cope *et al.*³ found the incidence of carcinoma twice as great in clinical single nodules as in all nodular goitres. Other figures for single nodules are: 3.8%,⁶ 19%,⁸ 24%,³ and 33.3%.¹

The sex incidence is generally given women: men, as 1:1 up to 40 years, and 2.5:1 after 40 years. In this hospital no male patients with carcinoma were seen during the period under review. Thus, the hospital incidence of carcinoma in both racial groups is 6% and 8% approximately, a figure not very different from those of the many reported series elsewhere. The incidence of carcinoma supervening on a multinodular goitre is, in Africans, 7.4% (4 of 54 operated cases), and in Indians, 9.7% (3 of 31 operated cases). These figures are higher than the true incidence, firstly because of those cases operated upon (18) where satisfactory histology was not available (some of which were probably nodular goitres) and, secondly, because of the small proportion of patients coming for cosmetic reasons alone. These figures refer to multinodular goitres, the occurrence of malignancy or toxicity in a single nodule being a rarity in this hospital.

Thyroid Abscess

Three patients with acute pyogenic abscess of the thyroid were seen, the patients being 2 African women and an African boy of 7 years.

The young boy had multiple abscesses in the buttock and leg. These, and a fluctuating abscess of the substance of the thyroid gland, were incised. The organism was a *B. coli*, and the condition settled following treatment with penicillin and streptomycin.

An African woman of 34 years had influenza 2 weeks before, followed by a sudden swelling of the thyroid. An abscess of the isthmus was aspirated, but no culture was obtained. The condition settled on penicillin treatment. The second African woman, 39 years old, had a swelling of the neck for 3 years. A sudden increase in size had occurred, causing difficulty in swallowing and breathing. Since the airway was obstructed a tracheostomy was done and the swelling, which appeared to be an inflammatory one, was explored. An abscess of the thyroid gland was evacuated, the organisms cultured being streptococci and pneumococci. Two months later, when the area had settled down, a partial thyroidectomy for nodular goitre was done.

Thyroiditis

No patients with chronic thyroiditis were seen and the clinical presentation of Hashimoto's and Riedel's disease appears to be rare in both racial groups.

SUMMARY

In this paper, 218 cases of thyroid disease in Indians and Africans are presented (125 African and 93 Indian). These represent a hospital incidence of 0.07% and 0.25% respectively, with a sex ratio of 12.8:1 and 6.2:1, women to men. The peak age incidence occurred in the decade 25-34 years.

In 93 personal cases there were no deaths, wound

infection was unpleasantly high (12%), recurrent nerve injury occurred in 2.1% (1.4% of the nerves at risk) of cases in which the nerves were displayed as a routine, and clinical tetany occurred in 3.2%, but persisted in only 1 patient.

Thyrotoxicosis is rare in Africans, but less so in Indians; a hospital incidence of 5.6% and 12% respectively is probably an artificially high figure. Approximately 3 of every 4 toxic cases in both races are primary, the remainder supervening on nodular goitre. All occurred in women.

The incidence of carcinoma is approximately 6% and 8% of operated cases among Africans and Indians respectively. In 4 of 6 Africans and 4 of the 5 Indian patients, the neoplasm occurred in a thyroid swelling of long standing. Only 1 child with carcinoma of the thyroid was seen, an Indian girl aged 5 years. The incidence of carcinoma in multinodular goitres was 7.4% in Africans and 9.7% in Indians. As with toxic goitre, the incidence of carcinoma

of the thyroid in this hospital is an artificially high one.

No accurate information is at present available on the advent of toxicity and neoplastic changes in single nodules. The relative infrequency of such nodules suggests that in Natal these 2 complications seldom occur in them.

Three cases of thyroid abscess are included, 1 occurring in a multinodular goitre which was later removed. No patients with Hashimoto's or Riedl's disease were seen.

REFERENCES

1. Cattell, R. B. and Colcock, B. P. (1953): *J. Clin. Endocr.*, **13**, 1408.
2. Cole, W. M., Slaughter, D. P. and Rossiter, L. J. (1945): *J. Amer. Med. Assoc.*, **127**, 883.
3. Cope, O., Dobyys, B. M., Hamlin, E. jnr, and Hopkirk, J. (1949): *J. Clin. Endocr.*, **9**, 1012.
4. Freeman, G. C. (1959): *A.M.A. Arch. Surg.*, **79**, 129.
5. Hawe, P. and Lothian, K. R. (1960): *Surg. Gynec. Obstet.*, **110**, 488.
6. Hudson, R. V. (1958): *Brit. J. Surg.*, **45**, 463.
7. Pemberton, J. de J. and Black, B. M. (1954): *Cancer of the Thyroid*. New York: American Cancer Society.
8. Rawson, R. W. in Means, J. H. ed. (1948): *Thyroid and its Diseases*, 2nd ed., p. 461. Philadelphia: Lippincott.
9. Riddell, V. H. (1956): *Lancet*, **2**, 638.
10. Soley, M. quoted by Rawson, R. W. (1948): *Op. cit.**
11. Till, A. S. (1955): *Proc. Roy. Soc. Med.*, **48**, 440.