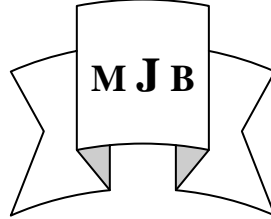


Etiology, Pathology of Thyroid Diseases in Aldewania City and their Effects on Management

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Abstract

Background: Most of thyroid disease caused by iodine deficiency which result in diffuse enlargement that progress into multinodular goiter (MNG) as the response to high TSH is heterogeneous. it is essential for proper treatment of goiter in most of cases to know its cause.

The aim of the study: is to show the importance of etiology of goiter on its management to avoid the bad practice of doing surgery for goiter without accurate diagnosis of its cause as this practice results in unnecessary or even harmful surgery .the study also show the frequency of some of complications of MNG which are of great value on its management to give opinion about benign course of the disease .

Material and Method: The study is retrospective which collect 400 cases of thyroid diseases that operated upon them in Aldewania Hospital during 3 years.

Results: of 400 caes,286 are caused by simple multinodular goiter which affect females in 85% of cases.53 are caused by neoplasm and 24 cases are thyroiditis.

Discussion :the most common cause of goiter is simple multinodular goiter which must manage by conservative management specially in young females in 60-70% of cases , complicated by carcinoma in 2% and by toxic goiter in 5% and most of cases are of small size and not caused mechanical obstruction.

Conclusion :the commonest disease of thyroid is MNG, the disease in aldewania is mild and not need surgery in most of cases and the incidences of complications in form of carcinoma and thyrotoxicity are small.

Key word: MNG, multinodular goiter.

الخلاصة

اجريت الدراسة في مستشفى الديوانية التعليمي وتضمنت ٤٠٠ حالة اخضعت لعملية الغدة الدرقية بشكل عشوائي وكانت النتيجة أن ٣٠٠ حالة هي مصابة نتيجة تضخم الغدة الدرقية المصحوب بعقد بسبب نقص اليود وان حوالي ٥٠ حالة ناتجة عن أورام تصيب الغدة وأن نسبة ٤٥% منها هو سرطاني والباقي حميد ولا يبدو زيادة في الأصابة بالأمراض السرطانية

كما أوضحت الدراسة أن حجم الغدة الدرقية يزداد مع العمر ففي العقد الثالث ٨٠% هو من الحجم الصغير ويزداد الى ٣٠% في العقد الرابع ونصف الأصابة في العقد الخامس و ٦٥% هو من النوع الكبير بعد الخمسين وأن اعلى اصابة هي بين عمر الثلاثين والأربعين عاما في الأناث وفي هذا السن يكون تأثير الحمل قد وصل أقصاه

أن علاج تضخم الغدة الدرقية الناتج من نقص اليود هو عموما تحفظي ما لم تكن له أسباب خاصة كالاورام والانسدادات الناتجة من قرب موقعها الى القصبة الهوائية والمرئ والأوردة قرب مدخل الصدر أو لاسباب جمالية ناتجة من زيادة مفرطة في الحجم ولذا لا حظنا أن ٨٠% من العمليات التي أجريت بين العشرين والثلاثين و ٧٠% من العمليات التي أجريت بين الثلاثين والأربعين هي

كما أوضحت الدراسة ان نسبة ٥% فقط من الحالات التي أجريت لها العملية كانت تعاني من أفرط في أفرز هورمونات الغدة الدرقية وعادة ما تصيب متوسط الاعمار و حجم الغدة صغير في معظم الحالات مقارنة مع دراسات اخرى اظهرت ان هذه المضاعفات عادة ما تحدث في كبار السن وان نسبتها عالية تصل الى ٣٠%.

Introduction

Most of nontoxic MNG caused by TSH stimulation secondary to inadequate hormone synthesis due to iodine deficiency in diet [1].

The heterogeneous structural and functional response in the thyroid resulting in characteristic nodularity.

Decrease in the incidence of goiter in old age explained by decrease in IGF and GH which is associated with decrease lean mass in the elderly, this is also seen in a patient with anorexia nervosa and also at least in woman, the loss of estradiol mediation associated with less growth of goiter[2,3].

Treatment of nontoxic MNG of small size is conservative.

Recurrence of non toxic multinodular goiter is seen in 15-40% with long term follow up and the risk is inversely correlate with volume of remnant postoperative [3,4]. reoperation is risky because of more incidence of nerve injury.

Regarding malignancy some study show up to 13% of malignancy in multinodular goiter[6]. the thyroid carcinoma show whitish nodules which are hard and not bulging while bisect so it is essential for the surgeon to look for gross pathology of carcinoma.

The annual incidence of thyroid differentiated carcinoma about 3.7 per 100000 of population and the sex ratio is 3 female to 1 male[14]. history of exposure to low dose ionized radiation to the thyroid gland places the patient at increased risk for developing thyroid carcinoma

Papillary carcinoma occur with a 2:1 female to male ratio in other study, and the mean age at presentation is 30-40 years[7].

Some hold that all hurthle cell neoplasm are malignant [10].

Toxic multinodular goiter caused by mutation in follicular cell result in hypersecretion of C-AMP. It has been documented to have spontaneous remission due to bleeding in nodule and necrosis.

The prevalence is high in Europe compared to united state due to iodine supplement is high in USA. reported up to 30% of cases get toxic multinodular goiter and mainly in old age[11].

Papillary carcinoma account for 80% of all thyroid malignancies in iodine sufficient areas and more often in women with 2:1 females to males, and the mean age of presentation is 30- 40 years. Follicular type account for 15% of thyroid cancer and occur more commonly in iodine deficient areas[7].

Occult carcinoma is incidental findings and be present in 2-36% of thyroid gland removed at autopsy and generally associated with a better prognosis than larger tumors, but they may be more aggressive than previously appreciated [9].

Adenoma needs tissue diagnosis so it is essential to do total lobectomy to show capsular or vascular invasion.[14] in hashmotos disease, the treatment with thyroxin is indicated even in subclinical hypothyroidism in case of pregnancy and those with ischemic heart diseases.[13]

Material and Methods

Retrospective study that collected around 400 cases that randomly operated upon them because of thyroid enlargement during 3 years in Aldewania city and all of cases had histopathology report that confirm the histopathology diagnosis and the exact size of thyroid that is removed.

The specimens was measured in 3 dimensions, the width dimension which include the width of both lobes and isthmus, the other two dimension are the length and the thickness dimension of large lobe.

We classified the multinodular goiter according to size into two groups, group A in which the longest diameter is 7 cm and less (SMALL) and B in which the longest diameter 8 cm and more (LARGE), the aim of classification is just to give imagination about the sizes of the thyroid that are excised as this point is

essential in the indications of surgery because the mechanical obstruction and cosmoses' indication depend on size.

Results

Of nearly 400 cases ,286 are multinodular goiter,14 cases are toxic nodular goiter, other 14 cases are graves

disease, and other 14 cases are parenchymatous goiter which is histological show hyperplasia without colloid which is a stage in early development of multinodular goiter.53 thyroid neoplasm, 22 hashimotos disease, 1 reidles and other one granulomas thyroditis.

Table 1 the classification of thyroid enlargement according to the causes.

Non toxic multinodular goiter	286
Toxic multinodular	14
Graves disease	14
Thyroiditis	24(22 cases are hashimotos)
neoplasm	53
Parenchymatous goiter	14

Table 2 the incidences of simple multinodular goiter according to the age and gender.

Age group	Females	Males
20- 29 years	48	7
30- 39 years	91	13
40-49 years	49	14
50-59 years	28	6
60-70 years	13	0
Before 20 years	4	2
total	233	42

N.B. ignore 10 cases as the age or sex is not mention.

85% of simple multinodular goiter are females mainly between30-40 years.

Regarding the size of thyroid ,we divided into two groups , 1- group A

the longest dimension of thyroid specimens are 7 cm and other dimensions are less of that .2- group B the longest dimension of thyroid specimens are more than cm .

Table 3 Size of simple multinodular goiter according to age.

AGE incidence	Group A	Group B
20-29 years	45	11
30-39 years	67	32
40-49 years	32	30
More than 50 years	27	36
Total	171	109

Most cases of multinodular are of small sizes 80%, the longest dimension less than 7 cm in age between 20 -30 while the number of large size 8 cm and more

form only 20% but increase gradually with age to be 40% in age group between 30-40 years while more than half of cases are of large size i.e. more than 8 cm in longest

dimension in age group 40-50 years while form 65% in age group 50-60 years.

Of 314 cases of multinodular goiter presented to surgery only 14 cases with toxic multinodular so around 5% of cases suffer from hyperthyroidism in contrast to other study which show one third of cases get this complication[7].

Twenty two cases are hashmotos thyroiditis presented with small goiter in most of cases and all cases are female with exception of one male case.

Age incidence in most of cases between 30-50 and it is very rare before 27 years.

So around 20% of small goiter in females of 27-50 years old are hashmotos disease.

Of 52 cases of thyroid neoplasm, 28 cases are follicular adenoma, 4 cases are hurthles adenoma, 2 of them males while the number of males adenoma cases are 7.

Seven cases of follicular adenoma are occur in multinodular goiter, while the other presented as solitary nodules.

Age of presentation is usually between 30 -50 years , and the minority that presented in late twenties are all of small sizes just detectable 1.5 -1.5 cm in diameter.

Table 4 Incidence of thyroid neoplasm according to type

Follicular adenoma	28 (4 of them hurthles)
Papillary carcinoma	20 cases
Follicular carcinoma	3 cases
Medullary carcinoma	1 case
lymphoma	1 case
Anaplastic carcinoma	0

Table 5 Incidence of tumor according to the sex.

	Males	Females
Papillary carcinoma	3	17
Follicular adenoma	7	21

Four cases of total 23 differentiated thyroid cancers occur in males, Two peaks in the age incidence of thyroid cancer, one before 30 years and other after 45 years and it is rare between these while adenoma is rarely presented clinically before 30 years and just palpable in this age and it mainly affect 30-50 years and can be of large size 4 cm or more.

Seven cases of papillary carcinoma occur in multinodular goiter, 4 of them are of occult type ,while 13 cases presented as solitary nodule. No case of papillary carcinoma reported in large sizes goiter. Also no case was diagnoses preoperatively.

Of total 314 cases presented to surgery only one cases with follicular

carcinoma so no evidence of increase incidence of this type of cancer in multinodular goiter in iodine deficient areas while the other two cases occurred as solitary nodule.

Discussion

Most of thyroid enlargement due to simple multinodular goiter due to iodide deficiency which form 75-80% of thyroid diseases. and it is a disease of females in the productive period ,most of the cases that presented to surgery between 25-50 years which form about 75% of cases.

The ratio of female to male is 6 to 1 in general while in other study may reach 13 to1[15] .the fourth decade show

the highest incidence in female while in males the incidence of disease not affected between fourth , fifth decades which are the peak but the ratio of male to female increased more in fifth and sixth decade.

The peak of incidence between 30-40 years in females explained by maximum number of pregnancy at this age .the effect of pregnancy decrease between 40-50 years while between 20-30 years still not reach maximum.

So increase supplement of iodine in diet or giving thyroxin to patient with simple multinodular goiter in pregnancy period may modify the rapid growth of disease in this period. WHO recommend minimum intake of iodine for pregnant 200 micro per day.

The size of goiter increased with age, between 20-30 years only 20% are of large size ,in age 30-40 years which show the highest incidence of goiter , 33% of large size, between 40-50 years half of cases are of large size while between 50-60, about 65% of large size.

So most of the goiter that is presented to surgery in our city are of small size that not enough to cause mechanical obstruction which reflect not sever iodine deficiency in our region ,also most of females cases are in productive period 20-40 years, in spite of that, surgery was done for them which are massive in some cases resulting in iatrogenic hypothyroidism, which even its subclinical form, lead to preterm labor and impaired cognitive development in the offspring.

Also there is risk of increase in size of goiter with age which made the goiter more liable for recurrence in operation done for this age group specially if leave large remnant[3,4].

We notice attitude for surgery in small goiter in young age in female group without specific indications of surgery result in unnecessary surgery and high rate of recurrence with possible bad effect on the offspring, 80% in age between 20-30 years and 70% in age between 30-40

years did unnecessary and even harmful surgery.

So the management of non toxic MNG in our city in young female which in majority of cases are of small size must be conservative in most of cases rather than surgery except small percentage with specific indications.

12% of cases of thyroid enlargement are caused by thyroid neoplasm ,more than 50% of them are adenoma and 40% are papillary carcinoma, because the surgeons omitted the FNCA in the management which is more informative if done under ultrasound guide, as some of nodules are 3 cm and less [8],result in under treatment of many of thyroid cancer so it is essential to look for this cause of thyroid enlargement either preoperatively by doing FNCA under ultrasound guide or to look for gross pathology of cancer in surgical specimens in theater.

The incidence of carcinoma in multinodular carcinoma is 2% and half of them are occult type and all of them develop in small size goiter so the size of goiter is not risk factor in development of carcinoma in multinodular goiter.

In contrast with other studies which show 4-17% of surgical specimens of MNG harbor a carcinoma ,typically of papillary variety[16]

In Japan, routine autopsies of persons not show thyroid disease or irradiation harbor carcinoma of thyroid in 17%[17]. So there is gross discrepancy between histological diagnosis of carcinoma and its mortality that mean most of cases are not invasive .

So if exclude occult carcinoma which are insignificant ,only 1% of MNG complicated by significant carcinoma which is presented with dominant nodule, according to above, the risk of carcinoma in MNG is not indication for surgery unless associated with dominant nodule Gross pathology of carcinoma in most of cases correlate with its histopathology which show whitish nodule, hard and

when bisect not bulging so every effort must be done by surgeon after remove the specimen to look for these gross pathology of differentiated carcinoma if the preoperative diagnosis is not available as seen in our study, yes it is not a definitive finding in diagnosis of carcinoma but it is highly suggestive.

Thyroid adenoma form about 50% of tumor, 4cases is hurthles cell adenoma.

Size of adenoma in 5 cases is 4 cm so size of nodule is not important in differentiation from follicular carcinoma and age incidence of adenoma is not reported before 25 years in this study.

80% of thyroid carcinoma is papillary and the age incidence is more common between 20-30 years and female to male ratio 6:1 ,so there are some variation regarding the age and the ratio of male to female in comparison with other studies[7].

Hashmoto s disease is a common cause of small goiter in female in age between 30-50 years which form about 20 % of cases presented to surgery. Diagnosis is done unfortunately post –operatively in which even lobectomy may push the patient into thyroid failure so it is essential to investigate by thyroid antibody or FNAC all small goiter in female between 30-50 years to avoid surgery on this group of patients .

14 cases of multinodular goiter show toxic goiter while other 14 cases show histopathology feature of toxic goiter but neither chemical nor clinical picture of toxicity which called parenchymatous goiter so only 5% of cases complicated by toxic goiter mainly in small size goiter and middle age and not operated on elderly with toxic goiter while other study show up to 30% of cases have transient episodes of thyrotoxicity .

In series collected many years ago at the mayo clinic 60% of the patients above 60 years show hyperthyroidism[18]. Hyperthyroidism may follow administration of high dose of iodine [19]

so the low incidence of thyrotoxic MNG in this study in comparison with other study[11] may explain by low iodine intake in old age with established MNG, in our region in compares with USA who add iodine to diet regularly .cold climate may have a role as the incidences are more frequent in cold area like Europe or USA, our study is done in different climate of course.

Conclusions

1-The commonest pathology affect the thyroid gland is simple multinodular goiter which form about 75% of thyroid diseases. 85% of cases are females and 80% of females are in productive period in which repeated pregnancy has aggravating effect. the ideal management is conservative rather than surgical in most of cases and more than two third of surgery done for this group are unnecessary or even harmful.

So the surgery is done for indicated cases but not for every case.

2-Toxic multinodular goiter complicate less than 5% ,this may partly explain by not add iodine to our diet in contrast to regions with high incidences which add iodine to diet regularly or to cold climate in areas of high incidences.

3- TPO and anti thyroid antibody are essential investigation in small size goiter in females between 30-50 years to exclude hashmos disease which form 20% of small size goiter in females and even lobectomy in such cases push the patient in thyroid failure.

4- 12% of cases presented to surgery is thyroid neoplasm, 45% are malignant ,80% of malignant is papillary carcinoma and no case of them diagnosis preoperatively due to omission of FNCA in management result in not choice the proper operation also the surgeon omitted to look for gross pathology of differentiated carcinoma result in high rate of under treatment.

5- No reported cases of large adenoma 3 cm and more in twenties so tumor of such

size in this age in favor of malignancy rather than adenoma.

6- Differentiated carcinoma is rare in multinodular goiter less than 2% ,half of them are occult type ,mainly in form of papillary type while only one case of follicular type discover in 300 cases operated for multinodular goiter so the risk of invasive carcinoma in MNG is slight and not indicated for surgical interference if not associated with dominant nodule. so the incidences of carcinoma are low in our city in comparison with other parts of world.

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