

The Role of Aspiration and Thyroxine Suppression Therapy in Management of Benign Thyroid Nodules

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Abstract

A prospective study on 142 patients presenting with (benign euthyroid nodule) , after diagnostic work-up included a clinical evaluation, thyroid function tests, ultrasonography, thyroid scintigraphy and fine needle aspiration cytology. Based on the investigations, patients were managed with aspiration and thyroxine suppression therapy for six months. Patients were divided into four groups according to their response of treatment ,group(1) complete shrinkage response ,group(2) reduction in size ,group(3) no response but same size and group (4) enlarge in size non responders. Of the 142 patients 17 (12 %) were male, and 125 (88 %) were female. The age range in 99 (69.7%) patients were between 21 and 50 years and forty three patients were above 50 years of age. We divided our result into four groups, group(1) complete shrinkage response 29 patients' (20.5%), group(2) reduction in size 45 patients' (31.8%), group (3) no response but same size 38 patients' (26.7%) and group (4) enlarge in size non responders 30 patients' (21%) Thyroxine suppressive treatment were effective in shrinking about one fifth of thyroid nodules. Similarly, there was reduction in size in about one third of nodule. From 17 male 6 patients (35 %) achieve complete response ,while only 23 female patients (18 %) achieve complete response, and from 17 male patients 5 (29 %) achieve reduction in size, while only 40 female patients (32 %) achieve reduction in size. Young age less than fifty achieve good response than older patients (63.6%). Single aspiration needed in 26 patients (18.3%) while multiple aspiration needed in 116 patients (81.7%).

Key words : Aspiration, Thyroid Nodules , thyroxine suppression treatment.

Introduction

Medical management of benign thyroid nodules may deter the requirement for medical procedure and morbidity related to it. Thyroxine inhibition treatment is being used in the medicinal management of euthyroid benign nodules ^{1 2}. Nodular thyroid infection still one of the common endocrine troubles. The majority thyroid nodules are benevolent hyperplastic injury however 5 to 20% of thyroid nodules are genuine neoplasm ³. The predominance of thyroid nodules differs impressively relying upon an assortment of elements that incorporate iodine consumption inside a given populace, age, sex, diet, drug and natural radiation presentation.

The age-related is increment the nodularity and thyroid volume. Little thyroid nodule are ordinarily found in patients with a simultaneous history of Hashimoto's Thyroiditis⁴. The significance of dealing with a thyroid nodule in the early separation among benign and harmful nodule, since the way to deal

with treatment in the two is thoroughly different. The viability of thyroxine concealment treatment in benign euthyroid nodule brings about the justification of medical procedure in such patients.

Most investigations have demonstrated that a little of thyroid nodule relapse in patients treatment with thyroid hormone. Nonetheless, the suppressive treatment appears to intervene with goitrogenesis in numerous patients, and recent hypothesis proposes that it could diminish the danger of thyroid oncogenesis⁵.

Inhibition of thyroid-stimulation hormone (TSH) discharge in ordinary subjects by the giving of thyroid hormone brings about thyroid decay ⁶, even though the pathogenesis of thyroid nodule and irregular nontoxic multinodular goiters is ineffectively comprehended, TSH is dared to be essential if not adequate and, along these lines, inhibition of TSH secretion may be relied upon to bring about a diminishing in nodule or goiter size or possibly avert further augmentation.

The significance of TSH in goiter production changes with the reason for the goiter. For instance, in patients with iodine inadequacy or autoimmune disease (Hashimoto's), an elevated TSH secretion is the dominating reason for goiter. Conversely, the majority of patients with thyroid nodule or irregular nontoxic multinodular goiters have typical serum TSH levels, especially persons with nontoxic multinodular goiters, the thyroid expansion is most likely caused by many factors (including TSH) that work after some time on thyroid follicular cells that have special manufacturing and growth possibilities. The effect is spread and presently multinodular thyroid augmentation; a few nodules inevitably become independent⁷ and others may experience cystic deterioration. Since the thyroid hormone is assumed to decrease goiter size by diminishing TSH emission, inhibition treatment would be relied upon to be ineffectual in patients in whom plasma TSH levels were previously subnormal because of autonomous thyroid hormone creation⁸.

Patients and Methods

The research was carried out in AL-Zahra teaching hospital from May 2011 until May 2015, on 142 patients presenting with (benign euthyroid nodule), after diagnostic work-up included a medical evaluation by history information, writing of present symptoms with their period, a systemic assessment and local assessment of the thyroid enlargement and the neck. The quantitative determination of plasma triiodothyronine (T3) and plasma thyroxine (T4) was carried out by radioimmunoassay (RIA), (normal values of T3: 0.72-2.2 ng/ml, T4: 5.6-13.6 µg/ml). Serum TSH was measured by the immunoradiometric assay (IRMA), (normal range 0.3–6.5 µIU/ml). Fine Needle Aspiration Cytology (FNAC) was performed as therapeutic and diagnostic, results were written as thyroid cyst. According to the early medical, biochemical assessment, FNAC and thyroid examination. The subsequent subjects were excluded from this study: Goiter hypothyroidism, hyperthyroidism, pre-pubertal and pubertal, distributed nodular goiter and suspicious FNAC result.

All included patients after aspiration given thyroxine suppression at a dose of 50–100 µg every day. TSH was

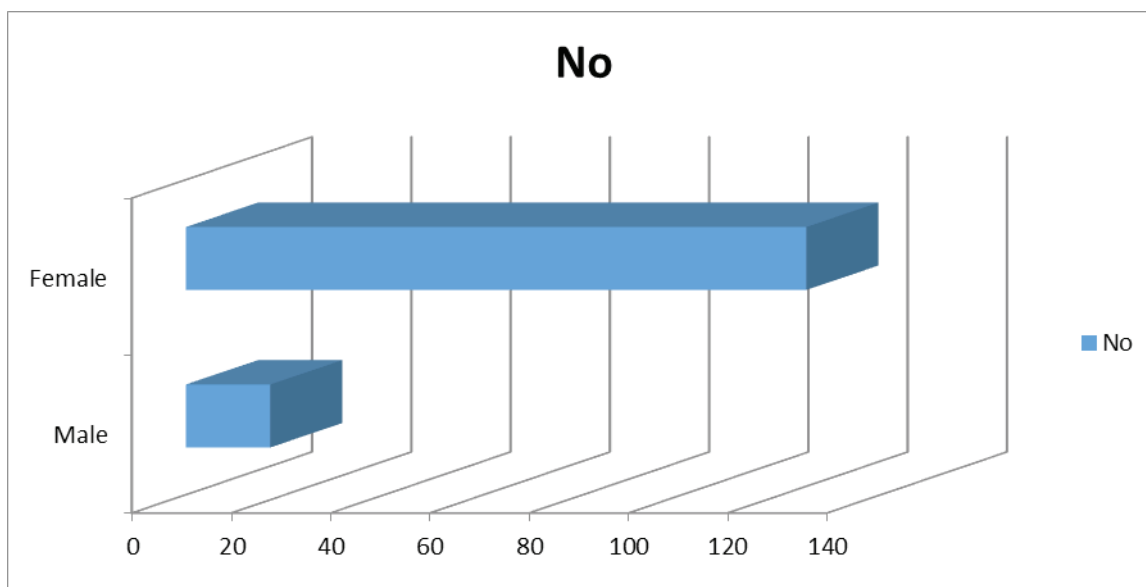
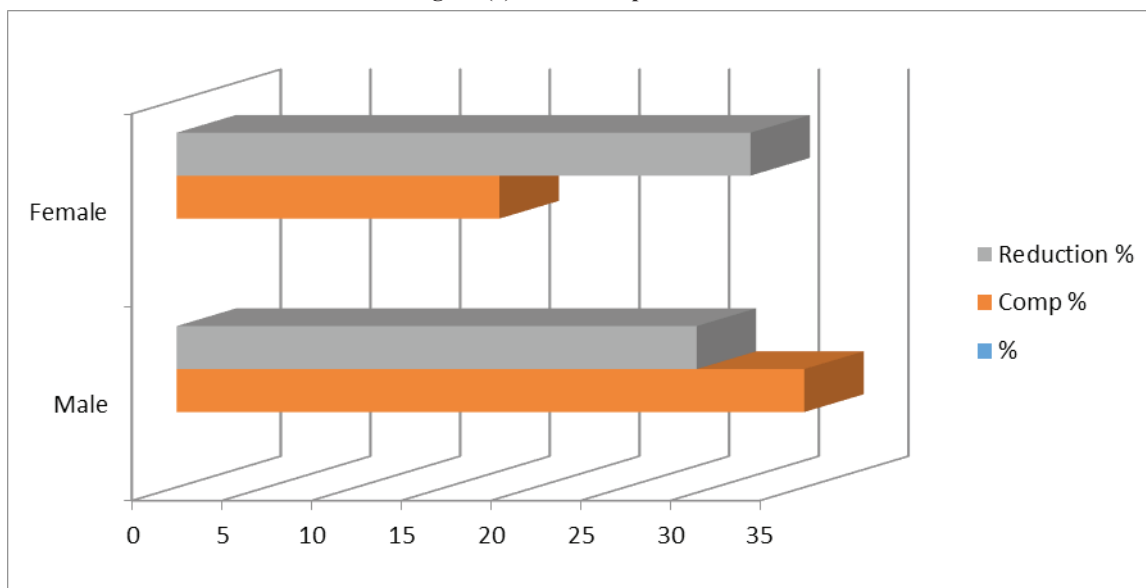
reserved in the little typical range for 6 months. Subjects were followed up every month to observe the size of the nodules by medical palpation and ultra-sonography. Also, repeated aspiration was performed for those with persistent nodule. Patients were divided into four groups according to their response of treatment: group (1) complete shrinkage response, group (2) reduction in size, group (3) no response but same size and group (4) enlarge in size non-responders'. Operation was performed in states where the nodule did not retreat following 6 months of thyroxine inhibition.

Findings

Of the 142 patients, 17 (12 %) were male, and 125 (88 %) were female. The median age was 37 years. Ninety-nine (69.7%) patients were between 21 and 50 years, and forty-three (30.3%) patients were above 50 years of age. We divided our result into four groups: group (1) complete shrinkage response 29 patients' (20.5%), group (2) reduction in size 45 patients' (31.8%), group (3) no response but same size 38 patients' (26.7%) and group (4) enlarge in size non-responders 30 patients' (21%). Thyroxine suppressive treatment was effective in shrinking about one fifth of thyroid nodules. Similarly, there was reduction in size in about one third of nodule. From 17 male, 6 patients (35 %) achieved complete response, while only 23 female patients (18 %) achieved complete response, and from 17 male patients, 5 (29 %) achieved reduction in size, while only 40 female patients (32 %) achieved reduction in size. From 99 young age patients (less than fifty years), 63 patients (63.6%) achieved good response either complete response 25 patients (25.2%) or reduction in size 38 patients (38.3%), while from 43 older patients, 11 patients (25.6%) achieved good response either complete response 4 patients (9.3%) or reduction in size 7 patients (16.2%). The common side effect was weight loss 7 patients (4.9%), insomnia 4 patients (2.8%) and palpitation 16 patients (11.2%) but all patients tolerated these side effects by reducing the dose. Single aspiration was needed in 6 patients (4.2%) while multiple aspiration was needed in 136 patients (95.8%). Group 3 and 4 (68 patients, 47.8%), there was no response in spite of aspiration and thyroxine suppression, and underwent subtotal thyroidectomy.

Table (1) Response groups and Sex.

Response	Male	Female
(1) Complete Shrinkage	6	23
(2) Reduction in Size	5	40
(3) Same Size	3	35
(4) Enlarge in Size	3	27

**Figure (1) number of patients sex.****Figure (2) patient sex and response to thyroxine suppression therapy.**

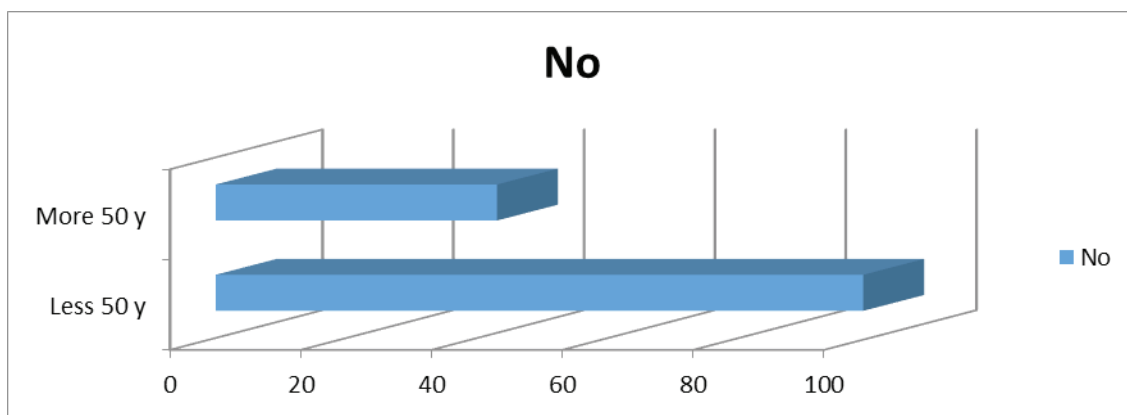


Figure (3) patients age distribution .

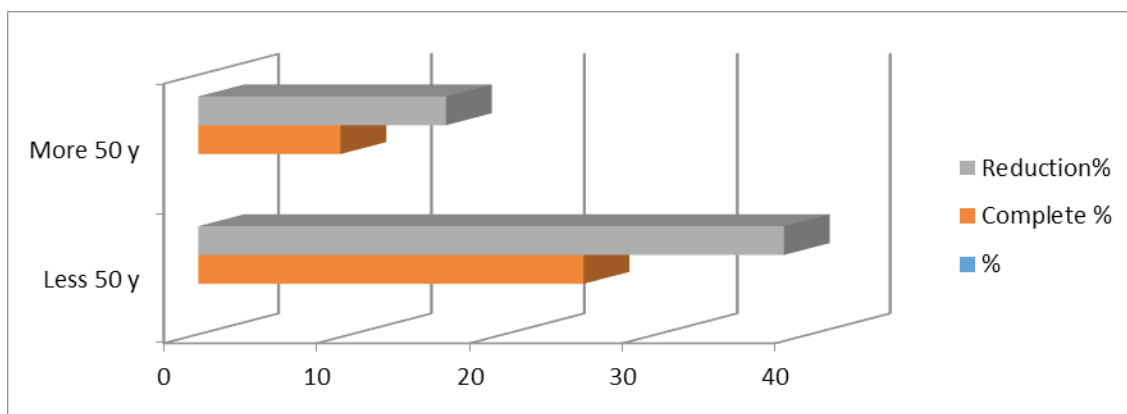


Figure (4) patients age and response to thyroxine suppression therapy.

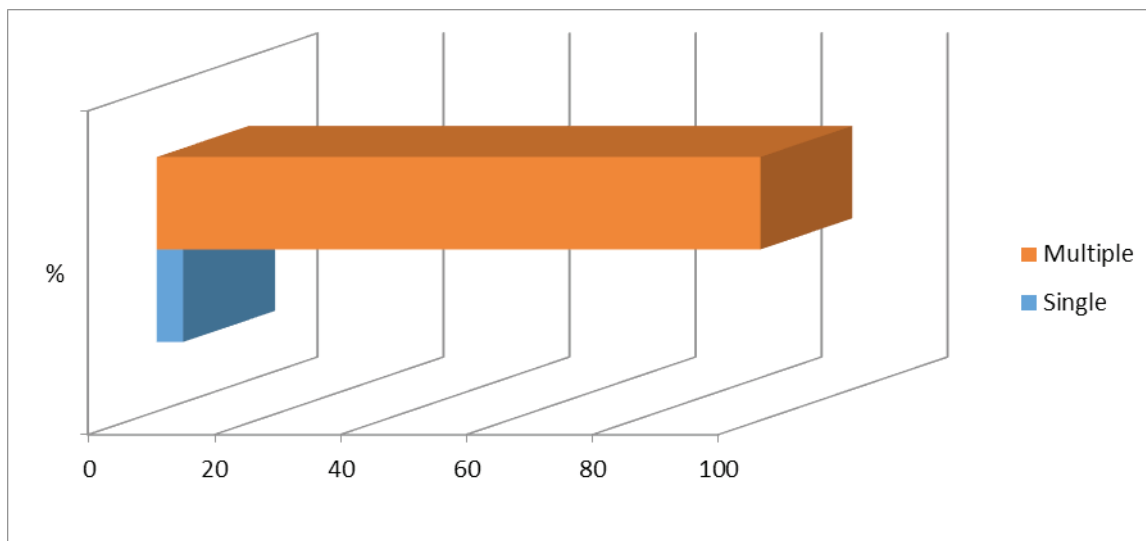


figure (5) the percentage of aspirationneeded

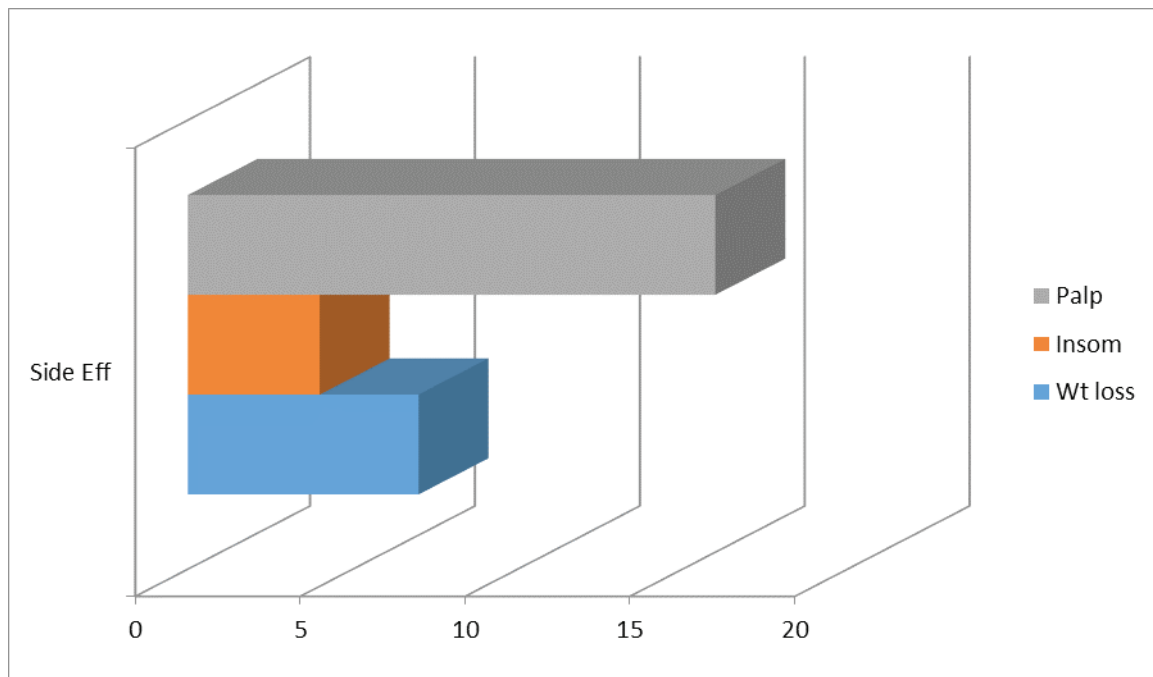


Figure (6) The common side effect

Discussion

The American Association of Clinical Endocrinologists (AACE) does not contain thyroxine inhibition in its advice for running of benign euthyroid nodule⁸ and restricts its use to patients with FNAC negative thyroid nodules not from iodine poor region, youthful persons with little goiter and nodules with no confirmation of practical autonomy. It adds additional conditions that thyroxine inhibition must be avoided in big goiter, clinically doubtful injury or those with insufficient cytologic example, in postmenopausal females or persons with osteoporosis and cardiovascular disease. However, thyroid hormone treatment for nodular goiter, for superficial reasons or to avoid investigative and healing operation surgery, results in reasonable to total weakening of the nodule⁹. Zygmunt, reports that in the early stage hyperplastic goiter may regress if thyroxine is given at a dose of 0.15- 0.2mg daily for a few months¹⁰.

Thyroxine inhibition treatment with aspiration is a suitable substitute as long as the person is followed-up cautiously at 3-month period because fluid may be re accumulated¹¹. It is set in dosage enough to inhibit the TSH value to 0.1–0.5 $\mu\text{U/ml}$ for 6 months; additional extended treatment is kept for persons in whom a reduce in nodule size is recognized on USG.

following 12 months, the dosage of thyroxine is reduced to preserve the plasma level of TSH in the little normal value. Information also proposes that thyroxine inhibition for benign nodules does not decisively result in decline of nodules, while a little examination of inhibition may be sensible in special patients¹². A study by La Rosa¹³ has shown a 35% reduction in the size of the colloid and regenerative nodules. In our study, we achieve shrinkage in about one-fifth of thyroid nodules (20.5%). Similarly, there was a reduction in size in about one-third of nodule (31.8%) at a response rate of 52.3%. In our study 17 patients (12 %) were male, and 125 (88 %) were female, Figure (1). These because that every kind of simple goiter are extrafrequent in women than men as a result of the found of estrogen receptors in thyroid tissues¹⁰.

The age range in 99 patients (69.7%) were between 21 and 50 years and 43 patients (30.3%) were more than 50 years of age Figure (3). In a review article, Mazzaferri¹⁴ reports an elevated in the occurrence of thyroid nodules with age and a occurrence of 5% in persons at 50 years present by physical palpation. The ultrasonography (USG) notice occurrence is far elevated, approximately 55%¹⁵. Among the response groups, From 17 male 6 patients (35 %) achieve complete response, while only 23 female patients (18 %) achieve complete response,

and from 17 male patients 5 (29 %) achieve reduction in size, while only 40 female patients (32 %) achieve reduction in size Figure (2). From 99 Young age patients (less than fifty years) 63 patients (63.6%) achieve good response either complete response 25 patients (25.2%) or reduction in size 38 patients (38.3%), while from 43 older patients 11 patients (25.6%) achieve good response either complete response 4 patients (9.3%) or reduction in size 7 patients (16.2%) Figure (4). We conclude that the younger age group of our patients due to the iodine deficiency which endemic in our country and most of our patients were fertile women.

We achieve good responses in the male group because of the absence of the estrogen receptor in thyroid tissue that not competent with thyroxine therapy¹⁰. Aspiration and FNAC have good sensitivity and a specificity in the exclusion of suspicious nodules¹⁶, but single aspiration was needed in 6 patients (4.2%) while multiple aspirations needed in 136 patients (95.8%) Figure (5) these mean that aspiration was not significant than thyroxine and fluid may re-accumulate without thyroxine and benefit only in FNAC stay the basis of helping to identify suspicious nodule. In our study, no response but the same size in 38 patients' (26.7%) and enlarge in size in 30 persons (21%), despite recurring aspiration and thyroxine inhibition. The response speed of 52.3% to aspiration and thyroxine inhibition in the current study was more than that in other studies, wherever it is write to level from 17% [15] to 35% [13]. The cause could be a larger number of younger persons (63.6%) presented less than 50 years of age). The common side effect is weight loss 7 patients (4.9%), insomnia 4 patients (2.8%) and palpitation 16 patients (11.2%) Figure (6) but all patients tolerate these side effects by reducing the dose.

Conclusion

Aspiration and thyroxine suppressive treatment were effective in shrinking thyroid nodule. Male patients achieve good response than female patients. The response is better in younger patients.

Conflict of Interest : none

Source of Funding : self

Ethical Clearance : From patients and my college .

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