

Thyroid Vigilance

INTRODUCTION

“Vigilance is the price of health.”

Modern science has made rapid strides in the disciplines of public health and laboratory medicine as well as clinical medicine. Advances in these fields have worked in tandem to improve the health of humankind. One domain in which this improvement is clearly visible is thyroidology.

Earlier diagnosed clinically and with the help of bioassays, thyroid disorders are now detected by sensitive radioimmunoassay (RIA) and chemiluminescence methods. The credit for this goes to Rosalyn Yalow, who invented RIA and revolutionized endocrine diagnostics.^[1] A similar revolution took place when L-thyroxine was isolated and manufactured successfully. Instead of having to use desiccated thyroid extracts and triiodothyronine tablets, physicians can now prescribe safe and effective levothyroxine,^[2] manufactured according to the Indian Pharmacopeia and United States Pharmacopeia standards. Yet, another paradigm shift took place in public health, when results of the Kangra Valley study, published by Sooch and Ramalingaswami,^[3] motivated the Government of India to establish a national iodine deficiency control program.^[4] This was able to eradicate iodine deficiency and markedly improve thyroid health in the country.

With these and other advances in diagnostics, therapeutics, and public health, the optimist may be excused for assuming that optimal thyroid health is secured for all. The reality, however, is different. We still face major challenges to thyroid health in these three domains.^[5] In this communication, we highlight some important issues, both clinical and community-related, which merit our attention.

DIAGNOSTICS

It was in 1979 that Rosalyn Yalow won the Nobel Prize for her work on RIA.^[1] Since then, the quality of assays for screening and diagnosis of endocrine dysfunction, including thyroid health, has improved manifold. The availability, accessibility, and affordability of these tests have also improved. It is unfortunate, therefore, that many laboratories continue to perform thyroid function tests using outdated technology such as enzyme-linked immunosorbent assay and enzyme-linked fluorescent assay. Clinical thyroidologists should take a proactive stance and refuse to screen, diagnose, or monitor persons for thyroid disease with inefficient biochemical methods.

Direct access testing (DAT) is another contentious issue which has been debated in India and abroad.^[6,7] On one hand, DAT is a patient-centered step as it empowers the individual to seek

medical advice and may reduce financial burden (if utilized rationally). On the other hand, DAT may be associated with inappropriate interpretation of results and may lead to what we term “thyro-stress.” DAT, therefore, should be allowed only with a clear disclaimer about its limitations and shortcomings.

MANAGEMENT

Pharmaceutics

Ever since thyroxine was first manufactured in 1927 by the British chemists Charles Robert Harington and George Barger,^[8] the drug has helped improve the lives of millions of people worldwide. In India, levothyroxine manufacturing began in 1952 at Worli, Mumbai. All international guidelines support the use of levothyroxine as a supplementation and replacement therapy. However, thyroid extract and triiodothyronine tablets continue to be available in the country. Although their usage may be indicated in certain specific indications (such as tissue hypothyroidism or deiodinase deficiency), their routine use cannot be condoned. More often than not, these drugs are misused as weight loss supplements by unqualified “experts.” Drug regulatory authorities and professional organizations should act in concert to curb the misuse of irrational thyrotrophic medication.

Chronic therapeutics

Another situation where thyroid vigilance is necessary is in the context of long-term therapy with drugs such as lithium or amiodarone.^[9,10] Both of these are known to induce thyroid dysfunction, even after their use has ceased. Patients on these drugs must be monitored regularly for the same. We must work in collaboration with colleagues from psychiatry and cardiology, to ensure prevention, early diagnosis, and early control of thyroid dysfunction in such patients.

Dermatological disorders such as diffuse nonscarring alopecia and autoimmune diseases such as vitiligo, urticaria, and alopecia areata are conditions where screening for thyroid dysfunction is important. Dermatologists need to be cognizant of the manifold cutaneous manifestations of thyroid disease and to practice thyroid vigilance when indicated.

Other indications for thyroid vigilance [Table 1] include patients presenting with obesity, galactorrhea, hyperprolactinemia, infertility, pericardial effusion, and carpal tunnel syndrome. Screening for hypothyroidism is recommended in patients suffering from autoimmune disorders such as celiac disease and Type 1 diabetes as well as metabolic diseases including diabetes and dyslipidemia.^[2] At the other end of the spectrum, screening for hyperthyroidism is mandated in patients of atrial fibrillation, hypokalemic paralysis, and osteoporosis.

Patients with a history of irradiation to neck, or exposure to other sources of radiation, are also at risk of developing thyroid dysfunction. Apt vigilance should be maintained to ensure timely identification and intervention in them.

While thyroid vigilance is necessary in the outdoor clinic, it is equally important in the indoor or hospital setting. Interpretation of thyroid function tests in ill patients is a complex exercise. This must be performed carefully by the astute physician, who understands the concept of sick euthyroid syndrome. Misdiagnosis and unnecessary treatment may cause more harm than benefit and should be avoided.^[11]

PUBLIC HEALTH

Independent India has made tremendous gains in public health, and we are justifiably proud of this. The National Family Health Survey-4, however, reveals disturbing trends. There are many districts, located predominantly in Andhra Pradesh, Karnataka, and Tamil Nadu, where the consumption of iodized salt is <80%. Mewat district of Haryana also joins this unhealthy list.^[12,13] Even though the impact of iodine deficiency on India's health is just a generation old, collective public (and physician) memory seems to have forgotten this. We must work to ensure public awareness about the benefits of iodization and propagate social marketing of iodized salt. We will ensure that we do not lose the gains which pioneer endocrinologists and community health specialists have worked so hard to achieve.

OUR CHILDREN, OUR FUTURE

As compared to the huge burden of adult thyroid disease,^[14] the number of infants born with congenital hypothyroidism may seem miniscule.^[15] Yet, children with congenital hypothyroidism represent an important asset to the nation. If screened, diagnosed, and treated in time, they can grow up into healthy and productive individuals. If not, the intellectual and physical disability is irreparable. Adult medicine and endocrine professional organizations must therefore advocate for nationwide a universal screening program for congenital hypothyroidism, using validated and effective technology. Congenital hypothyroidism may be missed if only thyroid-stimulating hormone (TSH)-based assays are used for screening the condition.

Vigilance for thyroid dysfunction is also necessary in children presenting with short stature or delayed puberty, symptoms or signs of early puberty, and Down's syndrome. The Rashtriya Bal Swasthya Karyakram can be utilized to create nationwide thyroid vigilance, using primary health-care staff.^[16]

PRECONCEPTION AND PREGNANCY

Preconception and pregnancy represent a window of opportunity,^[17] in which "transgenerational thyroid karma" (destiny) can be modified. Early detection and control of thyroid dysfunction during these crucial periods has been

Table 1: Selected clinical situations requiring thyroid vigilance

Symptoms
Short stature in children
Pubertal disorders in children
Goiter
Menstrual irregularity in females
Ataxia
Galactorrhea
Sexual dysfunction
History of use of amiodarone/lithium/weight loss drugs of unknown nature
History of exposure to neck irradiation
History of pituitary surgery/thyroid surgery
Family history of thyroid illness
History of residence in iodine deficient area/exclusive consumption of noniodized salt
Laboratory/imaging abnormalities
Pituitary hyperplasia/pituitary mass
Multiple ovarian cysts simulating malignancy
Pericardial effusion
Epiphyseal dysgenesis in children

shown to improve both maternal and neonatal outcomes. International guidelines on the management of thyroid disease during pregnancy are clear in their recommendations.^[18] Although they do call for trimester-specific TSH cutoffs to be used, they suggest threshold TSH values to begin intervention and to target. Till we do not achieve unanimity within the country, we should follow these internationally accepted guidelines. Physicians must work proactively with obstetrics and gynecology to ensure optimal fetomaternal thyroid health and thus achieve a healthy transgenerational thyroid karma.

SUMMARY

If vigilance is the price of freedom, then thyroid vigilance is the cost of ensuring a euthyroid, and healthy, India. We have previously called for a patient-centered approach to the management of hypothyroidism. This is the patient's right and our responsibility.

Thyroid vigilance, too, is our responsibility. As physicians, we are entrusted with the health of our countrymen and women. We must work with all stakeholders, including patients, diagnostic facilities, drug regulatory authorities, manufacturers, and other clinical disciplines, to ensure appropriate diagnosis and treatment of thyroid disease. We must also lend our voice to public health campaigns for the use of iodized salt and screening of congenital hypothyroidism. All these activities must be carried out in a concerted, sustained manner, to ensure that our society remains thyro-vigilant, and thyro-healthy, in the future.

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There are no conflicts of interest.

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REFERENCES

- Unnikrishnan AG, Kalra S, Baruah M. The other insulin story of 1921. *Indian J Endocrinol Metab* 2011;15:147-8.
- Khandelwal D, Tandon N. Overt and subclinical hypothyroidism: Who to treat and how. *Drugs* 2012;72:17-33.
- Sooch SS, Ramalingaswami V. Preliminary report of an experiment in the Kangra Valley for the prevention of Himalayan endemic goitre with iodized salt. *Bull World Health Organ* 1965;32:299-315.
- Tiwari BK, Kundu AK, Bansal RD. National iodine deficiency disorders control programme in India. *Indian J Public Health* 1995;39:148-51.
- Kalra S, Unnikrishnan AG, Sahay R. Thyroidology and public health: The challenges ahead. *Indian J Endocrinol Metab* 2011;15 Suppl 2:S73-5.
- Kalra S, Kalra B, Sawhney K. Direct access testing in thyroidology: Perils aplenty. *Thyroid Res Pract* 2013;10:35.
- American Thyroid Association (ATA) Position Statement on Direct Access Testing (DAT) for Thyroid Function. Available from: <http://www.thyroid.org/professionals/publications/statements/u8-11-28-dat.html>. [Last accessed on 2017 Mar 05].
- Medvei VC. *A History of Endocrinology*. Lancaster, England: MTP Press; 1982. p. 850.
- Lazarus JH. Lithium and thyroid. *Best Pract Res Clin Endocrinol Metab* 2009;23:723-33.
- Eskes SA, Wiersinga WM. Amiodarone and thyroid. *Best Pract Res Clin Endocrinol Metab* 2009;23:735-51.
- Kalra S, Baruah MP, Sahay R. Quaternary prevention in thyroidology. *Thyroid Res Pract* 2014;11:43.
- District Fact Sheets. Available from: http://www.rchiips.org/NFHS/districtfactsheet_NFHS-4.shtml. [Last accessed on 2017 Mar 08].
- Kumar A, Kalra S, Unnikrishnan AG. Iodized salt in India: Insights from National Family Health Survey-4. *Thyroid Res Pract* 2016;13:49-51.
- Unnikrishnan AG, Kalra S, Sahay RK, Bantwal G, John M, Tewari N. Prevalence of hypothyroidism in adults: An epidemiological study in eight cities of India. *Indian J Endocrinol Metab* 2013;17:647-52.
- Desai MP. Congenital hypothyroidism: Screening dilemma. *Indian J Endocrinol Metab* 2012;16 Suppl 2:S153-5.
- Kardwal N, Dhingra M, Kalra S. Rashtriya Bal Swasthya Karyakram: Bringing thyroid to center-stage. *Thyroid Res Pract* 2017;14:1-2.
- Sahay R, Kalra S, Magon N. Ensuring an intelligent India: Managing hypothyroidism in pregnancy. *Indian J Endocrinol Metab* 2011;15 Suppl 2:S76-7.
- Alexander EK, Pearce EN, Brent GA, Brown RS, Chen H, Dosiou C, *et al.* 2016 Guidelines of the American Thyroid Association for the diagnosis and management of thyroid disease during pregnancy and the postpartum. *Thyroid* 2017;27:315-89.

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