

# South Asian Guidelines for Management of Endocrine Disorders in Ramadan

## Thyroid diseases and Ramadan

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### ABSTRACT

In the month of Ramadan, patients with thyroid diseases, most of the time, do not need treatment adjustments and can fast safely without any health hazards. Patients with hypothyroidism taking thyroxine can take their tablets on an empty stomach at bedtime instead of half an hour before Seher. Patients with hyperthyroidism, on methimazole/carbimazole can continue their dose in once or twice daily regimes, while those on propylthiouracil need to be switched. Hyperthyroid patients with severe symptoms should start treatment immediately and can avoid fast for few days after a consultation with their religious scholar.

**Key words:** Hyperthyroidism, hypothyroidism, Ramadan, thyroid disease

### INTRODUCTION

During the month of Ramadan, Muslims from all over the world abstain from food and fluid intake from dawn (Seher) to sunset (Iftar) for 1 month. This prolonged fasting causes several minor metabolic and hormonal changes in the body,<sup>[1]</sup> which rarely cause any problem to a healthy individual. However, problems do arise in certain chronic diseases like diabetes mellitus, and thus, patients are advised to consult their physicians before planning to fast. In patients with thyroid diseases, so far there are minimal data suggesting any adjustment in the treatment during Ramadan. We have explored the available evidence and provide some guidelines in this regard.

### HYPOTHYROIDISM

In Ramadan, minimal changes are observed in the levels of T3, T4, and TSH in a normal person.<sup>[2]</sup> Few studies have shown that T4 decreases significantly during fasting in Ramadan in both genders, while TSH increases significantly in male subjects, although TSH and T4 levels stay within the normal ranges. There is a positive correlation between T4 changes and number of days of fasting in women. Most of these changes revert back to pre-Ramadan levels once fasting is over.<sup>[3,4]</sup>

#### Options for thyroid hormone replacement and factors effecting absorption

Whether primary or secondary, thyroxine and its levo-isomer (levothyroxine) are the most widely available option for thyroid replacement. Thyroxine is taken usually orally (empty stomach) as recommended, as food/medications (cholestyramine resin, sucralphate, iron sulphate, calcium preparations, aluminum antacids, raloxifene, activated charcoal, various soya products, and food and herbal remedies) affect its absorption.<sup>[5-8]</sup> Also a fiber-enriched diet, the traditional South Asian diet, and coffee in early morning may also interfere with the absorption of levothyroxine.<sup>[9,10]</sup> The amount absorbed decreases from 80% in the fasting

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state to 60% in the fed state.<sup>[11]</sup> So, when taken with food, the absorption of levothyroxine is incomplete, resulting in variable and higher TSH levels. Standard drug information resources recommend that levothyroxine should be taken half an hour before breakfast on an empty stomach, to prevent interference of its intestinal uptake by food or medication.<sup>[12]</sup> While taking thyroxine in between/with food might not be best, due to variable reasons,<sup>[13]</sup> taking it at bedtime is another option, as it has shown to have almost the same effect as when taken on an empty stomach.<sup>[14,15]</sup>

## OPTIMAL TIMING FOR THE INGESTION OF THYROID MEDICATION DURING RAMADAN

During the month of Ramadan, changes in gastric motility (due to prolonged fasting), interference with heavy meals, possible alteration in the circadian rhythm and the effect of the deiodinase activity might alter the metabolism of the drug in the body. Based on the above information, it can be postulated that during Ramadan, the proper administration of thyroxine/levothyroxine is achieved if it is taken half an hour before *Sehr*. But most of the patients find it difficult to wake up that early and either miss the dose or take it with the meal. This problem can be easily managed, if levothyroxine is taken at bedtime, which too has an almost identical lowering effect (if not better) on TSH. The effect may be due to the better effect of factors such as gastric motility, heavy meals, circadian rhythms, and effect of deiodinase activity.<sup>[16-19]</sup>

## OPTIMAL TIMING FOR INGESTION OF THYROID MEDICATION AFTER RAMADAN

As people revert back to their usual routine/habits after Ramadan, it seems more logical to go back to their routine (as before Ramadan) after the Ramadan comes to an end. Based on our current knowledge of thyroid replacement regimens, it should not have any impact on the metabolic state of the individual.

### Hyperthyroidism

There are essentially no data on the outcome of hyperthyroid patients during Ramadan. Warning signs in a newly diagnosed or untreated thyrotoxic patient include the development of polydipsia, dehydration, diarrhea, and tachycardia, which would further worsen in the case of prolonged fasting. Patients with mild symptoms of thyrotoxicosis usually have no trouble in fasting but, those with severe symptoms can land into troublesome dehydration and diarrhea. These patients can skip fasting for few days till their symptoms improve. Quran (the holy book of Muslims) has given clear exemption to the

sick people from the fast during illness but they need to compensate for the missed days of Ramadan later. Patients can also be advised to discuss with a local religious scholar for such issues.

Early diagnosis and treatment of thyrotoxicosis is deemed an emergency. The use of thionamides like methimazole, carbimazole, and propylthiouracil (PTU) is effective in patients with hyperthyroidism. They are actively transported into the thyroid gland where they inhibit both the organification of iodine to tyrosine residues in thyroglobulin and the coupling of iodotyrosines.

## INVESTIGATIONS AND TREATMENT OF THYROTOXICOSIS DURING THE RAMADAN

Thyrotoxicosis includes hyperthyroidism (excessive hormone production by thyroid) as well as thyroiditis (inflammation of the thyroid gland). These two can be easily differentiated by a thyroid uptake study/thyroid scan. Approximately 5%–10% cases of thyrotoxicosis are due to thyroiditis. Differentiation is important as the treatment of these conditions could be entirely different. The mainstay of treatment for patients suffering from thyroiditis remains NSAIDs, steroids, or beta-blockers, and it remains a self-limiting condition. The management of this disorder during Ramadan depends on the severity of symptoms.

In the treatment of hyperthyroidism, thionamides are the used. Among thionamides, propylthiouracil has a limitation during Ramadan due to its required dosing of every 4–6 h. The other most commonly used antithyroid drug “methimazole” has a fairly long duration of action, and can be taken at any time of the day in a single or divided doses.<sup>[20]</sup> For that reason, in Ramadan, no treatment adjustment is needed in these patients and they can be monitored on the standard protocols. The carbimazole dose required to yield an equivalent dose of methimazole is approximately 40% higher. For example, a 10 or 20 mg dose of carbimazole yields roughly 6 and 15 mg of methimazole, respectively. This drug takes a week to show its maximum effect and thus it is added with beta-blockers for quick symptomatic control. Patients prefer to stay home and avoid frequent treatment adjustments. They can be followed easily after Ramadan. If the treating physician is considering alternate treatment options like radio-active iodine or surgery, these can be delayed till the completion of Ramadan for the said reasons.

## CONCLUSION

Although there are essentially no data on the adjustment of treatment protocols of patients with thyroid diseases,

we have proposed that hypothyroid patients can take their thyroxine at bedtime easily instead of half an hour before *Sehr*. For hyperthyroid patients, the preferred oral antithyroid treatment is methimazole, which can be taken once or twice daily in Ramadan easily. Patients with mild to moderate symptoms of hyperthyroidism can fast safely.

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