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(CASE REPORT)

Proton pump inhibitor-induced suboptimal response to levothyroxine: A primary care case report

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Abstract

Levothyroxine is commonly prescribed in primary care for hypothyroidism patients. Its absorption may be reduced significantly by concurrent medications, especially proton pump inhibitors (PPIs).[1,2] This case report represents a practical example of reduced levothyroxine efficacy due to omeprazole use and highlights key learning points for primary care clinicians.

Keywords: Levothyroxine; Proton pump inhibitor; Drug interaction; Hypothyroidism

1. Introduction

Hypothyroidism is a very common disorder which necessitates Levothyroxine replacement. Patients on this medication need regular monitoring of thyroid function to assess and adjust medication dose and evaluate if other concurrent medications such as Omeprazole in this case reduce effectiveness of treatment.

2. Case presentation

A 55-year-old female with a history of long-term primary hypothyroidism, stable for several years on levothyroxine 100 mcg daily, presented with new symptoms of fatigue and gradual weight gain. Blood results of thyroid function tests showed raised TSH (7.3 mIU/L). She had recently begun omeprazole 20 mg daily for new gastroesophageal reflux disease.

Although the first impression was a compliance issue but on detailed review, she revealed taking levothyroxine and omeprazole together with breakfast. The patient was counselled to take levothyroxine 30 minutes before breakfast and to switch from omeprazole to ranitidine. At 8-week follow-up, her bloods showed TSH normalized to 2.5 mIU/L with improved symptoms.

3. Discussion

This case implies a clinically relevant and probably under-recognized interaction between PPIs (omeprazole in this case) and levothyroxine. PPIs increase gastric pH lowering acidity, impairing dissolution and reducing levothyroxine absorption and subsequently its effect[3,4]

A detailed medication review and advice on administration timing (mainly empty stomach, separate from other drugs are crucial, specially that thyroxine levels increase after 1hour and peaks within 3 hours.[4]

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Clinicians in primary care are ideally placed to identify such interactions, adjust therapy, and prevent unnecessary dose adjustments or specialist referrals and provide further advice.[5]

Table 1 Examples of medications Known to Interfere with Levothyroxine Absorption [5,6]

Drug Class	**Example(s)**	**Mechanism of Interaction**
Antacids	Calcium carbonate	Bind to levothyroxine, reducing absorption
Proton Pump Inhibitors	Omeprazole	Increase gastric pH, impair dissolution
Iron Supplements	Ferrous sulfate	Chelation in gut
Bile Acid Sequestrants	Cholestyramine	Bind thyroid hormone in gut
Sucralfate	sucralfate	Adsorption, delays absorption
Ritonavir-containing drugs	Ritonavir	Induce metabolism, lowering T4 levels
lipase inhibitors	Orlistat	nonspecific adsorption

4. Conclusion

This case emphasizes the importance of medication timing and drugs interaction awareness in managing hypothyroidism.

Learning Points

- Always review new medications in patients with stable chronic conditions.
- PPIs can reduce levothyroxine absorption, leading to either subclinical or overt hypothyroidism.
- Medication timing and spacing strategies can reduce interaction.
- Monitoring thyroid function after initiating a PPI is advisable in patients on levothyroxine

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no conflicts of interest.

Statement of informed consent

The patient provided verbal consent for publication of this anonymized case.

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