International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622
Indexing: Embase
Impact Factor (RJIF): 6.71

www.gynaecologyjournal.com
2025;9(5): 40-42
Received: 23-06-2025
Accepted: 25-07-2025

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Carbimazole-induced acute kidney injury in late pregnancy: A case report

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DOI: https://www.doi.org/10.33545/gynae.2025.v9.i5a.1683

Abstract
We report the case of a 29-year-old pregnant woman who developed acute kidney injury (AKI) during her third trimester while receiving carbimazole for hyperthyroidism, with TI-RADS 3 colloid nodules in the left thyroid lobe. The patient exhibited symptoms consistent with hyperthyroidism, and carbimazole therapy was initiated at 3 months of gestation. Over the course of her pregnancy, a gradual elevation in serum creatinine was observed, from a baseline of 0.8 mg/dL to a peak of 2.59 mg/dL, accompanied by bilateral grade 2 medical renal disease by the 37th week. Carbimazole was discontinued at 37 weeks gestation, followed by delivery twelve days later. Postpartum follow-up revealed progressive improvement in renal function, with complete resolution of renal complication by two weeks. This case highlights the possible mechanisms of carbimazole-induced nephrotoxicity and emphasizes the need for close renal monitoring in pregnant patients receiving antithyroid therapy and to better manage subclinical hyperthyroidism.

Keywords: Carbimazole, acute kidney injury, pregnancy, hyperthyroidism, carbimazole nephrotoxicity

Introduction
Hyperthyroidism in pregnancy requires careful management [1] due to risks to both mother and fetus. Antithyroid drugs such as Carbimazole are commonly used, although their safety profile in pregnancy remains under close scrutiny. Nephrotoxicity is an extremely rare but potentially serious side effect [2, 3] as well as teratogenicity. We report a case of suspected Carbimazole-induced AKI diagnosed in the third trimester.

Case Presentation
A 29-year-old pregnant female G2P1L1 at 9 months gestation presented for evaluation of elevated serum creatinine. She was diagnosed with hyperthyroidism in early pregnancy. During her first trimester she was evaluated for symptoms unexplained by pregnancy having palpitation, anxiety, increased sweating and heat sensitivity, feeling of fatigue. She was diagnosed with hyperthyroidism and was started on Carbimazole 10 mg daily at 13 weeks gestation. Her symptoms resolved with time and herroutine antenatal labs were monitored.
During her third trimester, rising serum creatinine levels were noted, reaching a peak of 2.59 mg/dL. Urine protein loss was also intermittently positive. Despite no signs of preeclampsia or other renal disorders, nephrotoxicity was suspected. Carbimazole was stopped at 37 weeks gestation, and her labs were monitered.
The patient delivered vaginally at 38 weeks without any feto-maternal intrapartum and postpartum complication. During her labour she was observed for anticipated thyrotoxicosis and expectant management was done. A gradual improvement in renal parameters was noted postpartum, her weekly, 2 weekly and 6 weekly labs were obtained.

Data Analysis
Labporatory values over time were analyzed for thyroid and renal function. TSH levels remained suppressed during Carbimazole therapy. Serum creatinine showed a progressive rise during the third trimester. Urine protein showed transient positivity, ruling out preeclampsia as a primary cause and Serum markers for autoimmune or pregnancy specific cause of nephritis were negative ruling out lupus nephritis, HUS, sepsis, HELLP, AFLP or obstructive uropathy.

	6 WEEKS POSTPARTUM↓	2 WEEKS POSTPARTUM	1 WEEKS POSTPARTUM	DELIVERY ↓			CARBIMAZOLE STOPPED ↓			CARBIMAZOLE STARTED ↓
	15-Jul-25	17-Jun-25	10-Jun-25	3-Jun-25	26-May-25	24-may-2(	23-May-25	25-Apr-25	27-Nov-24	19-Nov-24	9-Nov-24
S TSH	0.76		0.6463	1.36	1.2691		1.15	1.4025	0.042	0.03	0.094
FREE T3	1.78		1.99					1.06	3.13	1.49	
FREE T4	0.78		0.98						1.09	10.04	
Urine Protein Loss	negative	negative	negative	negative	negative	30 mg/dl	100 mg/dl				
S CREATININE	1.25	2.8	2.59	2.31	1.66	2.42	2.37			0.08	
ANTI TPO					**40 U/ml**						
C3					**129 mg/dl**						
C4					**41.1 mg/dl**						
THROGLOBULIN ANTIBODY					**<1.3 IU/dl**						
ANTI Ds DNA ANTIBODY					**20.25 IU/dl**						
HISTONE ANTIBODY					**0.15 units**						

Fig 1: Laboratory parameters

Table 1: Ultrasound parametres

Date	Modality	Findings
04/06/2025	Usg whole abdomen	Moderate hepatomegaly with moderate splenomegaly with B/L echogenic renal parenchyma
24/5/2025	Renal artery doppler	B/L grade 2 medical renal disease
27/05/2025	Usg HRS thyroid	Tirads 3 wider than taller colloid nodule of 10*9 mm in left lobe
17/06/2025 (2 Weeks postpartum)	Renal artery doppler	Echogenic echotexture with maintained CMD

Table 2: Causality and severity Assessment Scales for drugs

Suspected drug	Naranjo scale [4]	Hartwig scale [5]	Outcome
CARBIMAZOLE	7 (Probable)	Level 5 (Severe)	Recovered

Discussion

Drug-induced toxicity remains an important yet often under-recognized cause of systemic illness, necessitating a high index of suspicion, especially when patients present with multi-organ involvement. The present case provides a compelling intersection between drug-induced toxicity and systemic organ involvement, assessed through radiological surveillance and causality grading tools. The simultaneous involvement of multiple organ systems in this case potentially atrributed to severity of drug-induced injury and the need for early recognition. Radiological surveillance provided objective evidence of organ dysfunction, while causality assessment tools supported the attribution of these findings to carbimazole.

Ultrasonography in this case demonstrated progressive bilateral renal parenchymal changes, initially presenting as grade 2 medical renal disease and subsequently evolving into diffuse parenchymal echogenicity, while corticomedullary differentiation (CMD) remained preserved following withdrawal of the drug. This evolution is consistent with drug-induced tubulointerstitial nephropathy, a rare but recognized adverse effect of antithyroid therapy [6]. Notably, serial renal Doppler evaluations performed before and after delivery confirmed the persistence of these abnormalities without evidence of acute hemodynamic compromise, favoring a subacute or chronic injury pattern rather than an acute nephrotoxic insult. These observations emphasize the insidious course of carbimazole-associated renal involvement and underscore the value of longitudinal imaging surveillance in defining the natural history of drug-related renal injury.

In parallel, abdominal ultrasonography demonstrated moderate hepatosplenomegaly which, in the absence of infectious or hematologic causes, is consistent with drug-induced liver injury (DILI)-a recognized yet underreported complication of carbimazole [7]. Such hepatosplenic enlargement may represent early hepatocellular stress or immune-mediated inflammation, mechanisms that have both been implicated in thionamide-related toxicity.

The detection of a TIRADS 3 colloid nodule on thyroid ultrasound, though incidental and not directly related to the adverse drug reaction (ADR), provides relevant context regarding the underlying thyroid architecture, which may influence drug metabolism and therapeutic responsiveness. The postpartum timing of imaging (17/06/2025) further adds clinical significance, as both pregnancy and the puerperium are known to alter drug pharmacokinetics and immune tolerance, thereby increasing susceptibility to idiosyncratic drug reactions.

Causality assessment with the Naranjo Algorithm [4] yielded a score of 7, classifying the ADR as “probable.” Complementary evaluation with the Hartwig Severity Scale [5] assigned a Level 5 (severe) rating, reflecting the requirement for therapeutic intervention and hospitalization. Despite this severity, the patient achieved complete recovery following prompt drug withdrawal and supportive management, underscoring the importance of early recognition and timely intervention in mitigating adverse outcomes.

This case highlights several important clinical considerations:

- Systematic imaging plays a pivotal role in the evaluation of suspected ADRs, particularly when clinical manifestations are non-specific or delayed.
- Postpartum pharmacovigilance remains under-recognized, despite substantial physiological changes during this period that may modify drug metabolism, sensitivity, and immune tolerance.
- Carbimazole, although widely prescribed and generally regarded as safe, can exert unpredictable renal and hepatic effects, even in the absence of classical early warning symptoms.

Conclusion

This case highlights a probable association between carbimazole therapy and acute kidney injury during late pregnancy, an underrecognized but clinically significant adverse drug reaction. The patient’s recovery following drug withdrawal, along with imaging and laboratory correlations, reinforces the importance of early detection and prompt management. Given the physiologic changes of pregnancy that may mask or modify drug-related toxicities, clinicians should maintain a high index of suspicion when monitoring renal and hepatic parameters in patients receiving antithyroid therapy. Comprehensive pharmacovigilance, including serial imaging and causality

assessment tools, should be integrated into the management of such cases. Further studies are warranted to elucidate the pathophysiological mechanisms underlying carbimazole-induced organ injury, to assess the utility of serial Doppler and ultrasound for early detection of subclinical changes in at-risk patients, and to explore the role of pregnancy-associated physiological shifts and postpartum immune reconstitution in modulating drug reactions.

Conflict of Interest
Not available.

Financial Support
Not available.

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How to Cite This Article
Chaudhary V, Bharti M, Rawat S. Carbimazole-induced acute kidney injury in late pregnancy: A case report. International Journal of Clinical Obstetrics and Gynaecology. Received: 21-06-2025
Accepted: 23-07-2025.