



# Labetalol Causing Possible False Positive Amphetamine Toxicology Screen Results in a Pregnant Woman with Hypertensive Crisis: Case Study and Report

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## Background

Labetalol is widely used for treatment of hypertension in pregnant women. Labetalol can cause false positive toxicology screens for amphetamines when tested by immunoassay due to a metabolite of labetalol, 3-amino-1-phenylbutane, structurally resembling amphetamine<sup>1,2</sup>.

## Objectives

We present a case of a woman presenting with acute severe hypertension with amphetamine detected on urine toxicology, resulting in uncertain diagnosis of pre-eclampsia or amphetamine use as a cause of hypertension.

## Case report

A 36 year old woman, gravida 5 para 4, at 34+3 weeks' gestation presented to the emergency department with central chest pain. Medical and obstetric history included essential hypertension ordinarily well controlled on nifedipine 30mg once daily, and pre-eclampsia in three previous pregnancies. Antenatal history was limited as the patient was not booked at our hospital and was unable to recall her estimated due date or antenatal progress. Serial blood pressures were 209/131, 186/135, and 190/140. Examination revealed bilateral lower limb pitting oedema, brisk reflexes and one beat of clonus bilaterally. A presumptive diagnosis of pre-eclampsia was made. Treatment was commenced with a single dose of labetalol 200mg orally. Following administration of labetalol, she became presyncopal and hypotensive with blood pressure 80/60, requiring intravenous fluid resuscitation. She then remained normotensive throughout the remainder of her admission and did not receive any additional doses of labetalol. Investigations demonstrated urate 0.35mmol/L with normal serum creatinine, liver function and platelets ( $167 \times 10^9/L$ ). Repeat investigations four hours later revealed dropping platelets of  $117 \times 10^9/L$  and were otherwise unremarkable. Urine protein/creatinine ratio was 14mg/mmol/Cr however the result was not available at the time. Urine toxicology screen was positive for amphetamine however the patient denied amphetamine use. It was unclear at the time whether this was a false positive result due to labetalol or a true positive result. The patient was transferred to her booking hospital where she discharged herself against medical advice the same day. Urine toxicology screen was sent for further analysis and confirmed the presence of methamphetamine.

## Discussion and conclusions

Amphetamine use can cause severe hypertension and as such, urine toxicology screening is commonly completed as part of the workup for new-onset severe hypertension. Clinicians should be aware of the possibility of labetalol causing false positive toxicology studies which may result in delayed or incorrect diagnosis and treatment, and stigmatisation of patients.<sup>3</sup> This case demonstrates the potential diagnostic dilemma in establishing the cause of a hypertensive crisis where a pregnant woman is treated with labetalol and there is clinical suspicion of amphetamine use which is denied by the patient, and whilst awaiting confirmatory toxicology results which take some time to process.

### References:

- <sup>1</sup> Gilbert RB, Peng PI, Wong D. A Labetalol Metabolite with Analytical Characteristics Resembling Amphetamines. *Journal of Analytical Toxicology*. 1995;19(2):84-6.
- <sup>2</sup> Battini V, Cirnigliaro G, Giacovelli L, Boscacci M, Massara Manzo S, Mosini G, et al. Psychiatric and non-psychiatric drugs causing false-positive amphetamines urine test in psychiatric patients: a pharmacovigilance analysis using FAERS. *Expert Rev Clin Pharmacol*. 2023;16(5):453-65.
- <sup>3</sup> Yee LM, Wu D. False-positive amphetamine toxicology screen results in three pregnant women using labetalol. *Obstet Gynecol*. 2011;117(2 Pt 2):503-6.