

Trust but Verify: A Case of Unintended Medication Omission

Andrew Bryant¹, Stuart Pitman², and Juan Lessing³

¹The University of Iowa Hospitals and Clinics

²University of Iowa Hospitals and Clinics

³University of Colorado Denver School of Medicine

August 24, 2022

Abstract

An accurate medication history prevents medication errors during transitions of care, whereas an inaccurate medication history may lead to unnecessary tests or prolonged hospitalization. We describe the case of a patient with chronic hypothyroidism who presented to the hospital with severe hypothyroidism and reported strict adherence to her home levothyroxine.

Introduction

An omitted, incorrectly dosed, or interacting medication may be the cause of patient symptoms at hospital presentation. An accurate and complete admission medication history facilitates identification of medication-related problems on admission; however, if the list of medications obtained during the medication history is not reliable, then linking a patient's symptoms to a medication-related problem becomes a more difficult task. Despite efforts by hospitals to compile reliable medication histories, errors may occur, and the clinician should consider a medication history error when the clinical picture and the medication history do not align. In these cases, applying the simple proverb "trust but verify" may provide the elusive piece needed to solve a diagnostic puzzle. Here we describe an application of "trust but verify" leading to the diagnosis of a patient's mystery illness.

Case Report

A 78-year-old woman with multiple medical comorbidities presented to the emergency department (ED) at an academic medical center with one week of progressive confusion and sleepiness. Her vital signs on admission were normal. Examination revealed a somnolent elderly female, oriented only to person. Additionally, a low-pitched coarse voice and delayed relaxation of reflexes were present on examination.

When conducting the admission medication history, the medical intern and senior resident accessed the list of the patient's outpatient medications from the health system's electronic medical record (the patient received most of her care at this hospital and its clinics) and then interviewed the patient's daughter, who managed her mother's home medications. Each of the patient's fourteen medication was verified with the patient's daughter including the dose, timing, and indication. The patient's daughter was quite familiar with detailed information regarding the patient's medications even specific nuances such as the importance of giving levothyroxine before breakfast.

Workup of the patient's encephalopathy revealed a markedly elevated thyroid stimulating hormone concentration (189 mU/L, normal: 0.4-4.2 mU/L). This finding was perplexing given a normal value one month prior with no missed levothyroxine doses in the past month according to the patient's daughter. A free T4 of 0.4 mg/dL (normal 4.5-11.2 mg/dL) confirmed severe, symptomatic hypothyroidism. The patient was promptly treated with intravenous (IV) levothyroxine due to concerns of possible compromised oral levothyroxine absorption. Further testing involving a levothyroxine absorption test, requiring up to nine

blood draws, as well as brain imaging to evaluate for an intracranial etiology, was considered to determine the underlying cause of the hypothyroidism in the face of reported levothyroxine compliance. After several days of IV levothyroxine and before initiating this intensive and costly workup, a resident physician on the team asked the patient’s daughter to bring in all her mother’s medications from home, including pill bottles and pill organizers. To everyone’s surprise—none more so than the daughter’s—levothyroxine was absent. A telephone call to the patient’s outpatient pharmacy confirmed no levothyroxine had been dispensed for the preceding month. The daughter, involved in the care of both her medically complex mother and father, had not realized the levothyroxine was missing from her mother’s medications. The patient’s home oral levothyroxine was then reinitiated by the medical team, and she made a complete recovery without relapse of symptoms.

Discussion

Potentially preventable medication-related ED visits and hospital admissions are unfortunately common [1-4]. From prospective observational studies, the median prevalence rate of hospital admissions associated with medication nonadherence is around 4% with almost all considered preventable [5].

In a prospective multicenter study involving twenty-one Dutch hospitals, 12,793 unplanned hospital admissions were screened with 714 (5.6%) determined to be medication-related (either from harm due to adverse effects or due to any error in the “process of [medication] prescribing, dispensing, or administering”). For those admissions categorized as preventable (332/714, 46.1%), a case-control design was used to determine potential risk factors; and in the multivariate analysis, nonadherence to medication regimen (odds ratio 2.3; 95% confidence interval 1.4-3.8), dependent living situation (3.0; 1.4-6.5), impaired cognition (11.9; 3.9-36.3), and polypharmacy (2.7; 1.6-4.4) defined as greater than or equal the use of five chronic medications, were among the statistically significant determinants of medication-related preventable admissions [3].

Returning to our case, how might the omission of levothyroxine have been prevented *prior to admission* ? It is possible that by decreasing the number of home medications this patient was taking (and the daughter was subsequently responsible for) and/or having a different reminder packaging systems (e.g., pre-filled blister packs from a pharmacy), may have prevented this episode of nonadherence leading to hospital admission. However, due to a scarcity of high-quality evidence and the need for more well-designed randomized controlled trials, optimal interventions to improve medication adherence in older adults prescribed multiple medications remains largely unknown [6].

How might the preadmission omission of levothyroxine have been detected *earlier in this patient’s hospital encounter* ? To decrease errors in the admission medication history due to nonadherence (i.e., recording that a patient is taking a particular medication preadmission, when in fact, they are not) a review of medication fill data may be helpful. This data can be obtained by directly contacting a patient’s pharmacy or pharmacies, or by having one’s institution purchase medication insurance claims data that can be viewed electronically. In our case, obtaining the fill history in addition to the caregiver interview and review of institutional medication records could have revealed this patient’s lack of a recent levothyroxine refill. However, even when armed with fill information, caution must still be exercised as even though a medication has been filled, a patient may not be taking it or may be taking it differently than prescribed.

Recently, a similar case of medication nonadherence masquerading as treatment failure was reported. Jethwa et al describe a 58-year-old male admitted to the hospital for deep vein thrombosis. Three weeks prior, the patient had been hospitalized for pulmonary emboli and started on apixaban, and although he described a 2-day period of nonadherence immediately after discharge, he reported strict compliance since that time. With his new deep vein thrombosis, treatment failure was the leading diagnosis on the differential. However, the medical team later consulted pharmacy to review the patient’s outpatient medication fill history and only at that time did the patient’s persistent nonadherence become clear. Adherence verification prevented mislabeling the patient as failing apixaban and avoided warfarin therapy and bridging with a parenteral anticoagulant [7].

Conclusion

Despite the best intentions by both a thoughtful and knowledgeable caretaker and the patient’s medical team in our case, a medication error occurred and then persisted, contributing to a longer-than-needed hospitalization while the patient received IV levothyroxine due to a concern of poor oral absorption. If the proposed laboratory test and imaging-based workup had been initiated, her inpatient stay would have been further extended. It was only when the concept of “trust but verify” was applied—in this instance, asking the daughter to bring in the patient’s home medications—that the unintentional home medication omission was discovered.

The mature clinician will often employ the paradigm of “trust but verify” in other high-stakes situations, such as personally viewing critical imaging and speaking directly with the radiologist. Questioning an admission medication history is an inexpensive and potentially valuable diagnostic modality. While understanding the efficiency demands of the busy clinical climate, we propose adopting this principle in clinical conundrums. Re-verifying a component of the admission medication history in our case was well worth the time investment; when in doubt “trust but verify” – it may just reveal the answer.

References

1. Zed PJ, Abu-Laban RB, Balen RM, et al. Incidence, severity, and preventability of medication-related visits to the emergency department: a prospective study. *CMAJ*. 2008 Jun 3;178(12):1563-9.
2. Marcum ZA, Pugh MJ, Amuan ME, et al. Prevalence of potentially preventable unplanned hospitalizations caused by therapeutic failures and adverse drug withdrawal events among older veterans. *J Gerontol A Biol Sci Med Sci*. 2012 Aug;67(8):867-74.
3. Leendertse AJ, Egberts AC, Stoker LJ, et al. Frequency of and risk factors for preventable medication-related hospital admissions in the Netherlands. *Arch Intern Med*. 2008 Sep 22;168(17):1890-6.
4. Chan M, Nicklason F, Vial JH. Adverse drug events as a cause of hospital admission in the elderly. *Intern Med J*. 2001 May-Jun;31(4):199-205.
5. Mongkhon P, Ashcroft DM, Scholfield CN, et al. Hospital admissions associated with medication non-adherence: a systematic review of prospective observational studies. *BMJ Qual Saf*. 2018 Nov;27(11):902-14.
6. Cross AJ, Elliott RA, Petrie K, et al. Interventions for improving medication-taking ability and adherence in older adults prescribed multiple medications. *Cochrane Database Syst Rev*. 2020 May 8;5(5):CD012419.
7. Jethwa TE, Moran KM, Maniaci MJ. Medication non-adherence as a cause of apixaban failure in venous thromboembolism: The importance of pharmacist medication reconciliation. *Clin Case Rep*. 2022 Feb 2;10(2):e05338.