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Aspirin Allergy Labeling after Desensitization: Education, Communication and Patient Safety

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Hypersensitivity reactions to aspirin and nonsteroidal anti-inflammatory drugs (NSAIDs) are among the most common causes of drug-induced hypersensitivity and constitute a spectrum of diverse immunologic and inflammatory processes¹. For many patients with NSAID hypersensitivity, aspirin desensitization can allow for administration of aspirin for therapeutic purposes, such as in aspirin-exacerbated respiratory disease (AERD)² or coronary artery disease (CAD)³. However, desensitization only induces a transient tolerance, contingent on daily and regular ingestion of a fixed aspirin dose; desensitization does not resolve the underlying hypersensitivity process. If a patient who is desensitized to aspirin receives a dose of aspirin that is higher than their tolerance threshold, or abruptly resumes aspirin after discontinuation of daily therapy, they are at risk for serious and potentially fatal hypersensitivity reactions⁴. Thus, even after desensitization, patients with aspirin hypersensitivity should continue to have aspirin/NSAIDs documented as a drug allergy in their medical records.

We describe three cases of patients with a history of aspirin hypersensitivity seen at our institution between 2019–2020, who underwent desensitization and subsequently had aspirin inappropriately removed from their allergy list in the electronic medical record (EMR).

Case 1 was a 69-year-old woman with a history of coronary artery disease and multiple drug allergies, including a history of hives after ingestion of aspirin. She also noted that naproxen caused an asthma exacerbation, and reported an unknown, remote reaction to ibuprofen. She underwent desensitization to aspirin 325 mg PO in 2007 prior to cardiac catheterization for suspected CAD. The aspirin dose was subsequently reduced to 81 mg PO daily. The patient was documented to have taken aspirin inconsistently. Aspirin was removed from the EMR allergy list in 2016 by a nurse during an inpatient hospitalization, with the reason listed as “Resolution of Allergy—per patient, desensitized to aspirin in 2009.” She was admitted to the hospital in 2020 for chest pain concerning for acute coronary syndrome. She was given a dose of aspirin 243 mg PO in the emergency department, to which she did not have any

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reaction. The primary inpatient team planned to administer a repeat dose of 243 mg PO on the second day of her admission, prior to cardiac catheterization. An inpatient pharmacist noted that her aspirin allergy had been deleted in the EMR. The Allergy and Immunology service was consulted for further guidance. The patient stated she believed she was no longer allergic to aspirin due to desensitization, but was not aware that aspirin allergy was removed from her medical record.

Case 2 was a 76-year-old man with a history of coronary artery disease and multiple drug allergies. His reported reaction to aspirin included angioedema of the face on two occasions in adulthood. He was desensitized to aspirin 325 mg PO prior to cardiac catheterization for CAD during an inpatient hospitalization in 2018. The aspirin dose was subsequently reduced to 81 mg PO daily. After this dose reduction, a repeat desensitization was done during that hospitalization, as he required aspirin 325 mg PO again prior to another cardiac catheterization. During that admission, after his second desensitization, the aspirin allergy was removed by an inpatient nurse, with the reason listed as “Resolution of Allergy—pt has been desensitized to ASA.” The patient continued aspirin 81 mg PO thereafter. He was admitted to the hospital in 2020 for chest pain concerning for acute coronary syndrome. He was given aspirin 243 mg PO once in the emergency department and underwent cardiac catheterization the next day. The Allergy and Immunology service was consulted later during this admission for evaluation of listed antibiotic allergies. The removal of the aspirin allergy was then noted by the inpatient allergy pharmacist. The patient was not aware that aspirin allergy had been removed from his medical record.

Case 3 was a 39-year-old woman with a history of AERD. She had a history of nasal congestion, breathing difficulty, and facial swelling with ibuprofen and naproxen. She underwent desensitization to aspirin 650 mg PO BID in 2019, for therapeutic management of her AERD. Her daily aspirin dose was later reduced due to heavy menstrual bleeding. The aspirin allergy was removed by a medical assistant during a primary care visit in 2019, with the reason listed as “Resolution of Allergy: desensitized.” The removal of aspirin allergy was noticed by her primary allergist during a follow-up visit several months later. The patient was not aware that the allergy had been removed from her chart.

In this case series, we present three patients with varied histories of aspirin hypersensitivity, who had their aspirin allergies delabeled in the post-desensitization setting. These events occurred in both inpatient and outpatient encounters. In two instances, the patients were given higher doses of aspirin without desensitization or consultation by an allergist, though fortunately neither patient experienced a reaction. In all cases, patients were unaware that the allergy had been removed from their medical record. These episodes illustrate a concerning possibility that inappropriate delabeling may lead to potential adverse events in the future.

We suspect the chain of events that lead to the delabeling episodes were multifactorial. As all allergies were removed with the reasoning of “Resolution,” a fundamental misunderstanding of desensitization among healthcare workers seems to be a contributing element. Similar misinterpretations, as well as uncertainty regarding ongoing allergy status and disclosure among aspirin-desensitized patients may also be involved. The electronic medical record (EMR) prompts users to reconcile an allergy with an ongoing medication,

and in the absence of immediately available documentation of desensitization, healthcare staff may be triggered to erroneously remove allergy listings for desensitized patients. Because aspirin therapy is often long-term, aspirin desensitized patients likely have many more interactions with the healthcare system during which an allergy reconciliation prompt may place them at risk for a delabeling event. We postulate that the three vignettes presented here are likely representative of many more similar cases that remain undetected or unnoticed.

Allergists should be aware of the risks of inappropriate delabeling of aspirin and NSAID allergy and consider practices and procedures to promote patient safety.

Patients undergoing aspirin desensitization must be counseled on the purpose and limitations of the procedure. Aspirin desensitized patients should be specifically reminded to continue to disclose aspirin as an allergy and contact the allergist if there is a need to dose-adjust or interrupt aspirin therapy. Allergists could consider providing cards or letters for patients to carry with them, especially given that other medical professionals may not be aware of or have misconceptions regarding desensitization. A template letter is suggested in Figure E1 in the Online Repository.

Allergists should also communicate a patient's desensitization status to primary care physicians (PCPs) and other specialists involved in the patient's care. This is particularly relevant in the non-AERD setting, when aspirin dosing and therapy are managed primarily by a PCP or cardiologist.

It is important for allergists to ensure that EMR documentation of medications and allergies is updated and accurate. Medication reconciliation is essential, and should occur at each visit. This is especially important for aspirin, as it is available over-the-counter, and thus may not always be included in EMR medication lists automatically populated with prescribed medications. Similarly, the EMR allergy list should also be reviewed at each visit. Aspirin desensitization can be briefly described in a free-text domain to be easily visible to providers reviewing an allergy list. Our institution uses the following standardized phrase:

Patient desensitized to aspirin *** mg PO daily on <<date>>. Aspirin/NSAIDs should NOT be removed from the allergy list. Desensitization induces tolerance only to the daily dose of aspirin. If there is a need to dose adjust or discontinue aspirin, please contact Dr. *** or the Allergy fellow on-call.

A functionality built into allergy modules within an EMR to specifically indicate desensitization would be useful to accurately reflect a patient's allergy and enable more precise decision support features to guide non-allergist clinicians.

To our knowledge, this is the first case series to describe delabeling of aspirin allergy after desensitization. These episodes highlight a previously unrecognized, yet crucial vulnerability for aspirin desensitized patients – one which has the potential to lead to serious adverse events and harm. We believe allergists should be cognizant of this phenomenon, and consider implementing strategies to educate patients, communicate with the medical team, and promote descriptive, accurate documentation of allergies.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Clinical Implications:

Aspirin desensitized patients may be at risk for inaccurate removal of the aspirin allergy listing from their electronic medical record. Allergists should be aware of this risk, and promote patient safety by educating patients, communicating with providers, and ensuring accurate medication reconciliation and allergy documentation.

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