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Ingrid B. Böhm, MD, Aart J. van der Molen, MD

INTRODUCTION

Although it seems easy and unspectacular, currently the documentation of contrast medium (CM)–related hypersensitivity reactions is incomplete or missing. While high standards are established for both imaging and its documentation, there is no such progress detectable for the documentation of hypersensitivity reactions induced by CM. As reported previously [1], in most electronic or conventional patient records, the documentation of CM hypersensitivity lacks standardization and is sparse, incorrect, incomplete, or missing. Two reasons underlie the problem: first, physicians with little experience in working with CM document CM-hypersensitivity reactions and second, best practices are not "sexy." The good news in this scenario is that radiologists and physicians increasingly miss a clear and exact documentation. Moreover, in the era of developing support from artificial intelligence, it is mandatory to use standardized documentations. Therefore, the goal of this article is to present the documentation of CM-induced hypersensitivity reactions in a standardized manner, which is essential for safe CM applications in follow-up CM-enhanced procedures.

The following three major facts are essential for safe CM applications in follow-up CM-enhanced procedures, and the documentation of one additional minor fact is optional.

MAJOR FACT: CULPRIT CM (OBLIGATORY)

"Patient reacted to the applied contrast agent" is a sentence we regularly find in patients' records. This information is not enough for safe follow-up CM applications. At the moment when a patient reacts, the involved personnel know exactly the name and dose of the culprit CM. Several months or years later, nobody possesses this information any longer. Therefore, it is obligatory to note the name and dose (volume and concentration) of the injected or applied CM. The exact name of the culprit CM is mandatory to avoid it and to apply a nonculprit substance, which usually the patient will tolerate very well [2]. In selected cases, the decision-making process for choosing an individually well-tolerated CM should be based on skin testing by a drug allergy specialist.

One additional remark: In the context of an adverse reaction following the application of a CM, the CM will in most cases be the culprit substance. One should be aware that other non-CM compounds (eg, latex, heparin) could be also responsible for the observed adverse event [3].

MAJOR FACT: CLINICAL SYMPTOMS (OBLIGATORY)

Unfortunately, patients' records rarely mention symptoms. Often one can read "The patient reacted" or "The patient experienced a mild/moderate/severe reaction." Such information is not helpful. Even noting the degree of severity says everything and nothing because of the lack of standardization of the grading system. For example, even patients who experienced only harmless skin redness have been documented as exhibiting "severe adverse CM reactions." Consequently, it is more useful to mention a patient's individual symptoms (eg, urticaria, bronchospasm, decreased blood pressure).

Exactly documented symptoms clearly show the severity of a reaction and the need for prophylaxis in the future. For example, patients with skin redness only, need no special prevention program. The more severe a reaction, the greater the challenge for its management.

The great challenge in this scenario is that most radiologists are not familiar with the correct nomenclature of special symptoms. In particular, cutaneous symptoms as well as delayed adverse events are difficult to designate correctly. In this regard, a review article that provides an overview of such reactions is helpful [4].

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The term "iodine allergy" should always be avoided because this kind of allergy does not exist. The term is incorrect and may lead to unnecessary or insufficient prophylactic actions in future [5]. Other classifications, such as "allergy-like" and "physiological" reactions, are also no longer accepted because they are incorrect, and therefore they should be replaced by correct classifications, such as type A and type B reactions.

MAJOR FACT: DATE AND TIME (OBLIGATORY)

CM hypersensitivity reactions are dynamic reactions that arise, persist for a certain period, and finally disappear. Therefore, the date of a reaction clearly shows the clinical relevance of a previous adverse event. Reactions that occurred a few months ago are of great clinical impact. CM hypersensitivity reaction histories with events of more than 20, 30, or 40 years ago are rarely of clinical relevance anymore. As a rule, if patients remember neither the clinical symptoms nor the total event, this could suggest a reaction without relevance. The more severe a reaction, the longer it will last and vice versa. Mild reactions, such as erythema, some single wheals, and itching, usually disappear within several months. Moderate reactions (eg, minimal dyspnea or bronchospasm, generalized urticaria, angioedema, slight decrease in blood pressure) can persist for few years. Severe reactions (anaphylaxis) will last for several years, sometimes for more than a decade.

MINOR FACT: TREATMENT AND EFFECTS ON SYMPTOMS (OPTIONAL)

It is important to know which specific treatment was given. The reaction of the symptoms to the specific treatment and their time course are also of importance. In addition, information on longer clinical follow-up may be useful.

STANDARDIZATION IN THE FUTURE: GUIDELINES AND ELECTRONIC PATIENT DOSSIER SYSTEMS

Taken together, to improve the safety of CM applications in patients with histories of hypersensitivity reactions, and with respect to upcoming support from artificial intelligence, it is important to improve the documentation of CM-induced hypersensitivities. On the basis of three major facts (culprit CM, clinical symptoms, and date of the adverse CM reaction) and one minor fact (treatment and effects on symptoms), prophylactic individual management programs for safe CM applications are possible in patients at risk.

In recent guidelines on CM safety, recommendations for standardization have already been provided [6]. We believe that it is important to strive for an international effort in standardization in the documentation, to introduce similar recommendations in other guidelines that are widely used in clinical radiological practice [7,8].

In addition, we would like to call on the manufacturers of electronic patient dossier systems to join forces with clinical practice guideline makers to establish uniform CM hypersensitivity registration modules in their software.

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