

Anaphylaxis in a Central University Hospital: A 2-Decade Comparison Study

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To the Editor:

Anaphylaxis is the most severe clinical presentation of acute systemic allergic reactions [1]. Recent publications show an increasing temporal trend for hospitalizations due to anaphylaxis, especially in the pediatric population, accounting for up to 0.26% of overall admissions [2]. Lack of awareness among health care workers can lead to underdiagnosis and undertreatment or delayed treatment of this medical emergency. The first definition and criteria were proposed in 2004 [3]. Since then, a number of papers have been published regarding the diagnosis, acute management, and prevention of anaphylaxis [1,4,5].

We reviewed the clinical records of patients admitted to a Portuguese university hospital with a diagnosis of anaphylaxis/anaphylactic shock between January 2007 and 2017 (second decade). The results were compared with those of a previous study that ran from January 1996 to 2006 (first decade) [6].

A total of 69 clinical charts were reviewed in the second decade compared with 72 in the first. Sixteen cases (23%) were excluded in the second decade compared with 19 (26%) in the first, resulting in a total of 53 patients for each decade. Considering hospital admissions for all causes, the rate of anaphylaxis was approximately 0.01% in both decades. Most patients were female (57% vs 53%, second vs first decade), with a mean (SD) age of 52 (27.3) years (vs 45 [31.4]), and 21% of the patients had self-reported allergic diseases (vs 26%) (Table). Of the total number of admissions, 17% of patients were aged ≤ 18 years (vs 15%).

In contrast to the first decade, where 35 patients (66%) were admitted for anaphylaxis/anaphylactic shock, these diagnoses were less prevalent as a primary diagnosis in the second

decade, with 40 patients (75%) admitted for nonanaphylactic causes. Drugs were the largest group of suspected triggers in both decades. When comparing culprit agent frequencies between the second and the first decades, we found that drugs were involved in 81% vs 85% of cases, respectively (food in 13% of cases in both decades, dyes and blood products in 2% vs 0%, and hymenoptera venom in 2% of the cases in the first decade). One case (2%) in a patient with mastocytosis in the second decade was considered idiopathic.

Regarding drugs, β -lactam antibiotics were most frequently implicated in the second but not in the first decade, where contrast media were responsible for most drug-related reactions. As for food, the main route of contact was ingestion, except for 1 reaction (first decade), which occurred after a child entered a room where nuts were being cracked, with inhalation reported as the only point of contact. All the implicated agents are listed in the Table.

Reactions mostly occurred within the first hour (75% vs 85%, second vs first decade). At least 3 organ systems were involved in 45% of cases compared with 32% (second vs first decade, $P < .01$). Cardiovascular symptoms were the most frequent (81%), followed by respiratory symptoms (75%) in the second decade, in contrast to the first decade (43% respiratory and 39% cardiovascular symptoms, $P < .01$ for both). Cutaneous symptoms were the third most frequent symptoms in both decades (72% vs 38%, second vs first decade, respectively, $P < .01$), followed by gastrointestinal involvement (17% vs 6%). Biphasic reaction occurred once (vs 0), with cardiac arrest in 4% (vs 15%). The mortality rate decreased between both decades (4% vs 6%, $P > .05$).

Among the patients who died from the anaphylactic reaction, the suspected agents were drugs in 4 cases (β -lactams, rifampicin, methylprednisolone/acetylsalicylic acid/paracetamol, and contrast medium) and blood products in 1 (platelets). Of the deceased patients, 40% had a prior history of drug hypersensitivity (with the suspected agent, rifampicin, in 1 case), and 40% were hospitalized for reasons other than anaphylaxis/anaphylactic shock.

Adrenaline was administered in 64% of patients (vs 55%), and the patient was referred to the allergy and clinical immunology outpatient clinic in 43% vs 23% of cases ($P = .03$ and $P = .02$ respectively).

Considering that adrenaline autoinjectors are not usually recommended in drug reactions, we analyzed prescription of these devices only in anaphylaxis to food, hymenoptera venom allergy, and idiopathic reactions. Five out of 8 patients were prescribed an adrenaline autoinjector in the second decade compared with 1 out of 8 in the first.

We analyzed the epidemiology, etiology, and management of anaphylaxis in 2 consecutive decades in the same hospital. We observed that the frequency of anaphylaxis as primary diagnosis decreased considerably from 0.008% in the first decade to 0.003% in the second. This change could be because

Table. Suspected Trigger Agents

	Second decade, No.	First decade, No.
Drugs	44	49
β-Lactam antibiotics	15	8
Contrast media	9	10
Non-β-lactam antibiotics	4	6
NSAIDs	4	7
Other analgesics	1	4
Chemotherapy	3	0
Other	8	14
Foods	7	7
Nuts	2	3
Cow's milk	2	0
Seafood	2	1
Fresh fruits	1	2
Legumes	0	1
Blood products	1	0
Hymenoptera venom	0	1

Abbreviation: NSAID, nonsteroidal anti-inflammatory drug.

the study population was predominantly adult or because emergency department patients can remain under surveillance for up to 24 hours, if required, without hospitalization. Only about 11% of these emergency episodes result in hospitalization.

Comparison of our findings with those of studies performed in clinical settings again revealed a predominance of drug-triggered reactions [7,8]. Interestingly, a new group of drugs became apparent in the second decade, namely, chemotherapeutic agents. In fact, in a Korean study, chemotherapeutic agents were the main cause of in-hospital anaphylaxis (42% of cases) [9]. In our hospital, most reactions to chemotherapy occur in the day care hospital, where patients are evaluated by allergists and hospitalization is rarely necessary. We also found an unexpectedly low frequency of mucocutaneous symptoms (less than 80%) in both decades, possibly owing to undervaluation/underreporting of said manifestations by health professionals or to resolution of these symptoms at admission (spontaneously or related to prior treatment).

Management of anaphylaxis improved, with an increase in emergency administration of adrenaline and referral to the allergy and clinical immunology outpatient clinic, although both remained below expectations. This was particularly true of the referral rate, as more than half of the patients were not referred. Prescription of adrenaline autoinjectors increased almost 5-fold between decades for anaphylaxis caused by food and hymenoptera venom, as well as for idiopathic anaphylaxis, although it is difficult to assess the significance of this finding owing to the limited number of episodes.

Although progress was evident, allergy and clinical immunology still play an important role in filling the gaps both in the recognition and management of anaphylaxis and in the evaluation and long-term follow-up of affected patients.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

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