

Anaphylactic Shock in General Internal Medicine Practice: Current Diagnostic Challenges and Emergency Management Strategies

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Abstract: Anaphylactic shock remains a rapidly progressive and potentially fatal emergency, with increasing incidence worldwide. Despite the availability of international guidelines, mortality persists due to delayed recognition and underuse of epinephrine. Importantly, a significant proportion of first medical contacts occur in outpatient and internal medicine settings rather than emergency departments. This review aims to analyze current evidence regarding epidemiology, pathophysiology, clinical heterogeneity, diagnostic pitfalls, and emergency management strategies of anaphylactic shock, with a specific focus on challenges faced by general internists. The gap between guideline recommendations and real-world clinical behavior is critically discussed.

Keywords: anaphylaxis, anaphylactic shock, internal medicine, epinephrine, emergency algorithm, biphasic reaction.

Relevance of the Topic

Degenerative diseases of heart valves (especially aortic stenosis and mitral valve degeneration) are one of the most common structural pathologies in cardiology today. The frequency of these diseases is increasing with the aging of the population. The degenerative process can be subclinical for a long time, but progressive fibrosis and calcification lead to severe hemodynamic disturbances, heart failure, and the need for surgical intervention.

Background:

Anaphylaxis is defined as a severe, life-threatening systemic hypersensitivity reaction characterized by rapid onset and potentially fatal airway, breathing, or circulatory compromise [1]. Global epidemiological data demonstrate a steady rise in incidence over the last two decades, particularly in adult populations exposed to polypharmacy and biologic therapies [2,3].

Lifetime prevalence is estimated up to 5%, while hospitalization rates continue to increase in developed healthcare systems [4]. Fatal outcomes, although relatively rare, are largely preventable and most often associated with delayed epinephrine administration [5].

Traditionally, anaphylactic shock has been considered a domain of emergency and critical care medicine. However, clinical data indicate that a substantial number of episodes develop in outpatient clinics, diagnostic departments, and general wards [6]. Therefore, the role of the general internist in early recognition and immediate intervention is increasingly critical.

Aim: The aim of this review is to critically evaluate current evidence on early diagnostic criteria and emergency management of anaphylactic shock in general internal medicine practice, and to identify gaps between established guidelines and real-world clinical implementation.

Materials and Methods:

This narrative review is based on analysis of international clinical guidelines, epidemiological studies, and peer-reviewed publications addressing pathophysiology, risk factors, clinical presentation, and emergency management of anaphylaxis. Publications indexed in major medical databases were analyzed,

with emphasis on adult populations and non-emergency clinical settings.

Results and Discussion

1. Pathophysiological mechanisms and hemodynamic consequences

Anaphylaxis is mediated by activation of mast cells and basophils with subsequent release of histamine, tryptase, leukotrienes, prostaglandins, and platelet-activating factor [7]. Although IgE-mediated pathways remain classical, non-IgE mechanisms are increasingly recognized, especially in drug-induced reactions [8].

Systemic vasodilation and increased vascular permeability result in rapid intravascular volume depletion, sometimes exceeding 30% within minutes [9]. This profound distributive shock may be accompanied by myocardial depression, forming a mixed hemodynamic pattern [10]. Recognition of this mechanism explains why aggressive fluid resuscitation is often required in addition to vasopressor therapy.

2. Etiological profile in internal medicine

In adult populations, medications represent the leading trigger of anaphylaxis [3]. Antibiotics, nonsteroidal anti-inflammatory drugs, radiocontrast media, and monoclonal antibodies account for the majority of hospital-based reactions [2,11].

Patients commonly managed by internists frequently have comorbid cardiovascular disease and are treated with beta-blockers or ACE inhibitors, which increase severity and complicate treatment response [5,12].

3. Clinical heterogeneity and diagnostic uncertainty One of the most critical challenges in internal medicine practice is clinical variability. While cutaneous manifestations are common, up to 20% of fatal cases may present without urticaria or angioedema [5].

In elderly patients, cardiovascular collapse may be the initial manifestation [13]. Gastrointestinal or isolated respiratory symptoms may dominate early presentation [4]. Such variability contributes to diagnostic hesitation, especially when symptoms mimic vasovagal syncope, myocardial infarction, panic disorder, or asthma exacerbation [9].

Anaphylaxis remains a clinical diagnosis. Laboratory markers such as serum tryptase may support retrospective confirmation but must never delay treatment initiation [1].

4. The epinephrine implementation gap

Despite universal guideline agreement, epinephrine remains underused in real-world settings [6]. Studies demonstrate that it is administered in less than half of confirmed anaphylaxis cases [6,14].

Contributing factors include fear of cardiovascular complications, diagnostic uncertainty, and overreliance on antihistamines and corticosteroids. However, delayed epinephrine administration is the strongest predictor of fatal outcome [5].

Intramuscular injection into the anterolateral thigh provides rapid absorption and remains the recommended first-line intervention [1,4]. There are no absolute contraindications in suspected anaphylactic shock.

5. Emergency management algorithm for internists

Immediate management includes:

- Prompt recognition of clinical criteria [4];
- Immediate intramuscular epinephrine (0.3–0.5 mg in adults);
- Supine positioning with lower limb elevation;
- High-flow oxygen administration;
- Rapid intravenous crystalloid infusion in hypotensive patients [9];
- Repeated epinephrine administration if required.

Antihistamines and corticosteroids are considered adjunctive therapies and must not delay epinephrine use [1].

6. Biphasic reactions and observation strategy

Biphasic anaphylaxis, defined as recurrence of symptoms after initial resolution, occurs in 5–20% of cases [15]. Risk factors include severe initial presentation and delayed epinephrine administration. Observation periods should be individualized based on clinical severity, generally ranging from 4 to 24 hours [4].

7. Prevention and secondary management

Post-event strategies include allergist referral, trigger identification, patient education, and prescription

of epinephrine auto-injectors [1,2]. However, data indicate that a significant proportion of patients are discharged without adequate counseling, highlighting systemic deficiencies in continuity of care [14].

Conclusions

Anaphylactic shock in internal medicine practice is not a rare complication but a foreseeable emergency in patients exposed to medications and diagnostic procedures. The principal determinant of survival is early recognition followed by immediate epinephrine administration.

The most significant barrier to improved outcomes is not lack of guidelines but insufficient implementation in real-world clinical practice. Educational interventions, standardized institutional protocols, and increased physician awareness are essential to reduce preventable mortality.

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