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What do you think about the best time for surgical intervention in patients with massive pulmonary embolism?

To the Editor,

We read with great interest the article by Close and Cherkas [1] "Successful treatment of presumed massive pulmonary embolism during cardiac arrest," which describes about the first documented case of successful use of reteplase for presumed massive pulmonary embolism during cardiac arrest in the United States. It is very interesting that the patient had such a dramatic response to reteplase. However, the fact that made us write this article is that we have performed and published a large study from 2004 until 2010 on 30 patients with massive and submassive pulmonary embolism in which retrograde pulmonary embolectomy was used as a main treatment modality [2]. In this method, the patients with lack of response to thrombolytic therapy and those who are critically ill or have contraindications for thrombolytic therapy are given a surgical option.

In our surgical technique, the chest is entered through a median sternotomy. Total cardiopulmonary bypass (bicaval cannulation) is initiated. First, the right atrium and the right ventricle are inspected for evidence of clot. Then, the main pulmonary artery is opened distal to the pulmonary valve, and the incision is extended up to the bifurcation of the artery. The clots are removed by means of atraumatic forceps, bolus saline flush, and suction. After performing conventional embolectomy, the interatrial septum is opened through an incision made on the area corresponding to fossa ovalis, and atrial septostomy is done. The pulmonary vein orifices in the left atrium are identified, and an endotracheal tube of size 5F to 5.5F catheter (with its cuff inflated) is inserted in each one by one. Afterward, oxygenated blood is infused from the pump with a mean pressure of 30 to 45 mm Hg for 60 to 120 seconds to each pulmonary vein. The pulmonary veins fill with blood in a retrograde fashion, and blood and small thrombi fragments begin to appear in the pulmonary artery and are washed out. For each vein, 750 to 1000 mL of oxygenated blood is infused by the pump in 1 to 2 minutes; hence, a total of 4000 mL of oxygenated blood is infused through the pulmonary veins in 8 minutes. Then, the atrial septal defect is closed [2].

Our results show that the combined amount of the removed clot by our technique is much more than that removed with the antegrade technique, and postoperative

echocardiography shows a significant decrease in systolic pulmonary artery pressure and right to left ventricle dimensions [3].

Although the results should not be excessively interpreted, indeed, we want to emphasize that surgical pulmonary embolectomy, especially if complemented by the retrograde technique, is a safe method and should not be used as a last resort for patients with massive pulmonary embolism. The immediate- and long-term results of retrograde embolectomy should be further assessed in prospective studies and compared with optimal medical therapy to establish this method as a routine surgical technique and a possible safe alternative to medical therapy.

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Color-coding triage and allergic reactions in an Italian ED[☆]

To the Editor,

Emergency department (ED) crowding is an international public health problem. The mismatch in ED and hospital resources may cause long waiting times and delays in

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treatments [1] and exposes to preventable medical errors [2]. Moreover, ED crowding is associated with prolonged stay and increased risk of adverse drug events (ADEs), estimated in 3% increased odds for every hour in the ED [3]. Adverse drug reactions (ADRs) account for 3% to 6% of all hospital admissions and occur in 10% to 15% of hospitalized patients [4]. An ADE should be differentiated from ADR, the latter including harm related to medication errors and drug/food medications. Adverse drug events are responsible for approximately 4.5 million ambulatory visits each year in the United States, especially in outpatient office practices [5], whereas only few studies have focused on prevalence and incidence of drug allergy in hospital-based populations.

We were interested with *drug allergy*, defined as an immunologically mediated drug hypersensitivity reaction, characterized by either IgE or non-IgE-mediated mechanism [6]. In particular, we aimed to focus on drug allergies referring to the ED and requiring hospitalization, to evaluate type and prevalence and relationships between initial triage assessment and hospital length of stay (LOS). This study was conducted between January and December

2009, at the ED of St Anna Hospital of Ferrara, an 863-bed tertiary care teaching hospital, with a yearly patient flow in the ED of approximately 75 966. Allergic reactions were defined as erythema, exanthema, urticaria, and angioedema. Age, sex, triage assessment color code, history, body temperature, drugs involved, LOS, and therapy were evaluated. In Italy, triage assessment is made on a color-code scale basis, with highest priority given to a red code, followed by yellow, green, and white. Descriptive analysis and χ^2 test were performed, and triage assessment represented the grouping variable. Multivariate analysis was not performed because of the limited sample size. Of 75 966 patients who arrived to the ED in the year 2009, 2842 (3.7%) were admitted to the ED ward. Of these, 58 (2%) presented a drug-related allergic reaction. Mean age was 58 ± 5 years (range, 18-88 years), 62% were female. Comorbidities included metabolic, heart, bone, infectious, gastric, vascular, neurologic, renal, and bowel diseases; 14% had a history of cancer (Fig. 1). One third of cases presented with fever (37°C - 40°C). Allergic reactions were caused by several kinds of medications: antiinfective (21 cases), antiinflammatory (14), endocrine

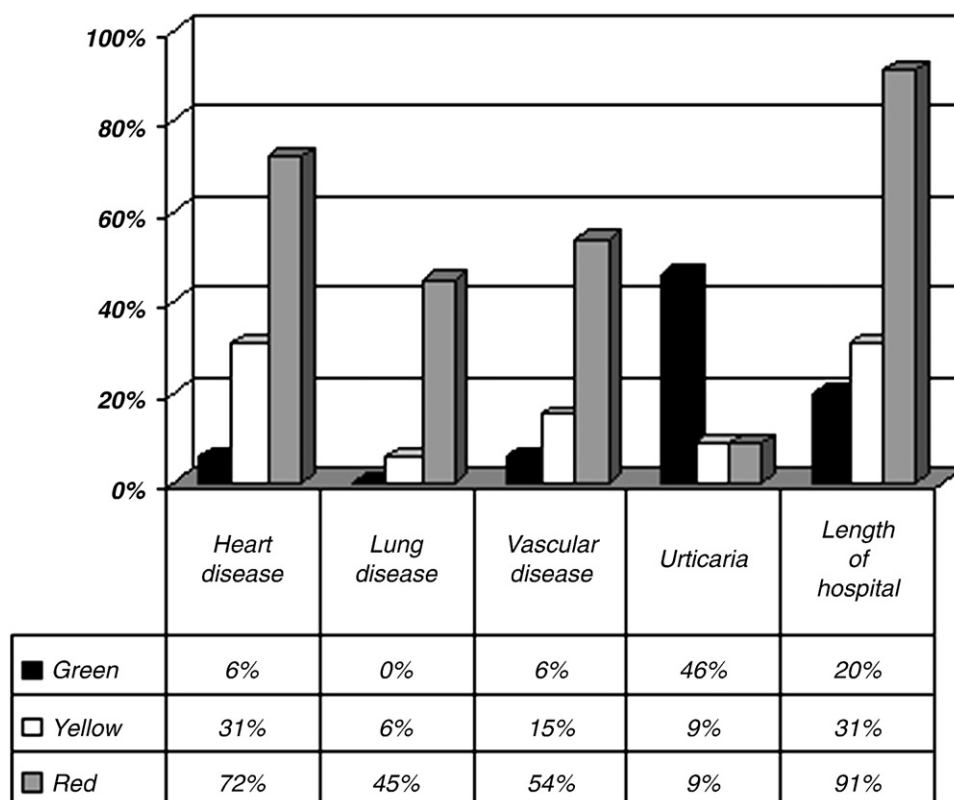


Fig. 1 Relationship between comorbidities, allergic reactions, hospital LOS and color coding in the 58 patients ($p < 0.01$).

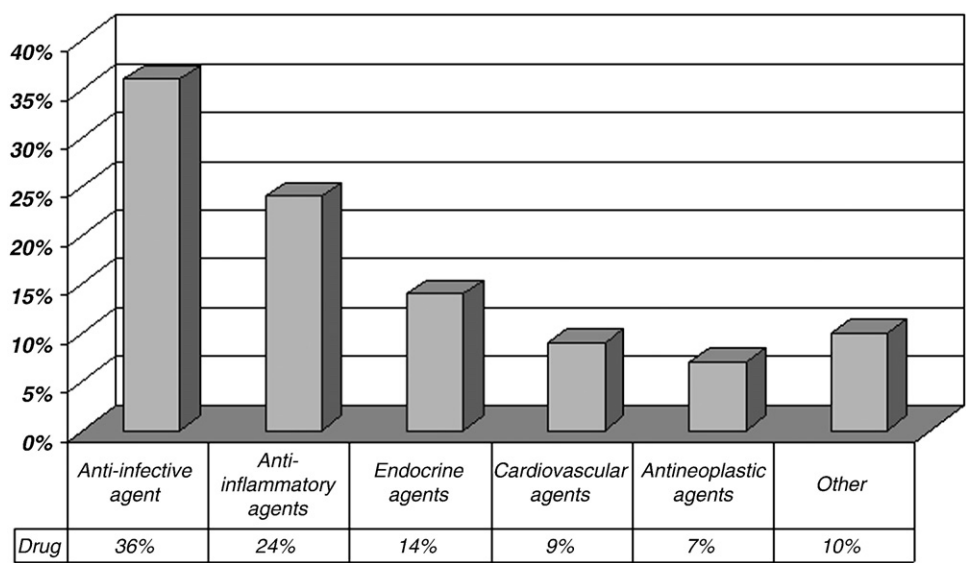


Fig. 2 Drugs related to allergic reactions in the 58 patients.

(8), cardiovascular (5), antineoplastic (4), and other (6) (Fig. 2). Triage assessment showed color code green in 26% of cases, yellow in 55%, and red in 19%. Length of stay was 6 to 12 hours in 19% of cases, between 12 hours and 3 days in 41%, and more than 3 days in 40%. Therapy at first evaluation included antihistaminics (50% of cases), steroids (50%), nonsteroidal antiinflammatory drugs (5%), plasma expanders (15%), and oxygen (17%). Triage assessment color code red was associated with history of heart disease, lung disease, and vascular disease, whereas only allergic reactions defined as urticaria were related to the green code. The red code was significantly associated with longer LOS of more than 3 days (Fig. 1).

Drug allergy exhibits different mechanisms and presentations and may lead to worst quality of life, delayed treatment, unnecessary investigations, and even mortality [7]. Allergic reactions are very frequent among ED attenders: national data in the United States estimated incidence of ADRs as 2.4 visits × 1000 population [8]. Of these, 33.5% were drug allergies, and 11.3% required hospitalization [8]. More recent data from the same source estimated in near 100 000 emergency hospitalizations for ADEs in adults 65 years or older [9]. Finally, severe cutaneous reactions, such as erythema multiform, Stevens-Johnson syndrome or, toxic epidermal necrolysis (one third of which ascribed to drugs) account for approximately 5,000 hospitalizations per year in the United States [10]. Although triage represents a highly useful tool to

prioritize patient care in EDs [11], very limited data relating triage assessment color code for allergic reactions are available. A retrospective 6-year Italian study found that drug allergy was the cause of ED referral in 7.5% of adult patients, with a triage assessment yellow code in 5.9% and red in 1.16% of cases [12]. The importance of a correct triage is important because it has been shown that ED patients presenting with ADEs incurred great health services utilization (risk of spending additional days in the hospital per month: 6.3% vs 3.4%; odds ratio, 1.52) and costs of hospital care (1.90× higher), compared with patients presenting for other reasons [13]. To the best of our knowledge, this is the first study evaluating the relationship between triage color code, clinical features, and LOS in subjects with allergic reactions presenting to the ED. Patients' age was younger compared with previous reports, and LOS exceeded 3 days in more than 40% of cases, with a good correspondence with the triage color code assigned upon ED arrival. Although allergic reactions represent emerging burden for EDs, because of the increase of patients' age and consume of medications [14], our knowledge is limited. Current epidemiologic data cannot differentiate immunologically and nonimmunologically mediated drug hypersensitivity, and the impact of different features (age, ethnicity, in- or outpatients, acute/subacute manifestations) and classes of medications are unknown. Emergency departments could represent optimal settings for research and support important translational knowledge.

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The use of i-gel extraglottic airway in a trauma patient

To the Editor,

Endotracheal intubation (ETI) is currently the “gold standard” for airway management in a prehospital setting, but this is a complex technique requiring practice and experience. Alternative procedures are essential for emergency physicians, to reduce unfavorable effects of multiple failed intubation attempts [1]. The i-gel disposable airway (Intersurgical Ltd, Workingham, UK) is proposed as a new supraglottic airway device made of a medical grade thermoplastic elastomer (Fig. 1). Its unique design does not



Fig. 1 The i-gel size 4.