Anthony J Frew

Dept. of Respiratory Medicine, Royal Sussex County Hospital, Brighton, United Kingdom

Optimising adrenaline administration

Strategies for optimising adrenaline administration in the treatment of anaphylaxis

Anaphylaxis is a systemic allergic reaction that often involves respiratory symptoms and cardiovascular collapse, which are potentially life-threatening if not treated promptly with intramuscular adrenaline. Owing to the unpredictable nature of anaphylaxis and accidental exposure to allergens (such as peanuts and shellfish), patients should be prescribed intramuscular adrenaline auto-injectors and carry these with them at all times. Patients also need to be able to use their auto-injectors correctly while under high stress, when an anaphylactic attack occurs. Despite this, an alarming number of patients fail to carry their auto-injectors and many patients, carers of children with known anaphylaxis and healthcare professionals do not know how to use their devices correctly, despite having had training.

There are five criteria that a life-saving adrenaline auto-injector should fulfill[1]:

1. It must deliver adrenaline to the correct tissue compartment
2. It must deliver adrenaline within the correct timeframe
3. It must deliver the correct dose of adrenaline
4. It must be robust and reliable enough to withstand real life use
5. It must be easy, convenient and safe for patients or carers to use

The robustness and performance characteristics of three AAIs available in Europe (Jext® [JX], EpiPen® [EP], Anapen® [AP]) were compared in a recently published study[2].

Cartridge-based devices (JX and EP) appeared to be significantly more robust and capable of rapidly and consistently delivering the correct dose of adrenaline to the correct tissue compartment than AP, a syringe-based device. Overall, JX performed better than EP or AP following robustness tests designed to mimic real-world use.

Further research is needed to assess adrenaline auto-injectors in terms of ease-of-use and convenience however promising advances have recently been made in terms of convenience (i.e. shelf-life, storage conditions, voice instructions) and size which may encourage regular carriage and correct use.

Regulatory requirements for new devices remain an important gap and could have been useful to harmonise the mode of administration thereby reducing confusion during emergency treatment and concern about re-training when patients are switched from one device to another[3, 4].

References

1. Frew AJ. What are the 'ideal' features of an adrenaline (epinephrine) auto-injector in the treatment of anaphylaxis? *Allergy* 2011;66:15-24
2. Schwirtz A, Seeger H. Comparison of the robustness and functionality of three adrenaline auto-injectors. *J Asthma Allergy* 2012;5:39-49
3. Seeger H. Comparison of 'place and press' and 'swing and jab' activation of a novel cartridge-based adrenaline auto-injector. European Academy of Allergy and Clinical Immunology 31st Annual Meeting, Geneva, 2012: Abstract 1684
4. Muraro A. Adrenaline auto-injectors are not all the same: important differences. European Academy of Allergy and Clinical Immunology 31st Annual Meeting, Geneva, 2012: Abstract 1691