

Accuracy in use of adrenalin auto-injectors in a simulated emergency situation: a comparison of JEXT, EpiPen and Emerade

Rebecca C Knibb, Kirsty Morton,
Aston University, Birmingham, U.K.

Introduction

- Being able to use an adrenaline auto-injector (AAI) properly in an emergency situation is vital when treating someone suffering from anaphylactic shock.
- Research has shown that nearly half of untrained participants are unable to correctly use an AAI training device after instruction.
- AAIs should therefore have an easy to use design and instructions should be very clear.

Aim

- This study aimed to assess intuitiveness and accuracy of use of JEXT, EpiPen and Emerade in untrained, non-allergic participants, in a simulated emergency situation.

Methods

Participants (n=90 adults) were randomly assigned to JEXT, EpiPen or Emerade. A simulated scenario involved a live patient acting unconscious after eating something they were allergic to; a loud ambulance siren played throughout.

Participants were asked to give the person an injection of adrenalin in the leg, using a trainer pen with no instructions available. They were then asked to give a second shot with a pen of the same design with instructions. The simulation was scored by the researcher and video recorded; participants were interviewed about their experience.

Results

- Overall only **27.8%** of participants could successfully administer adrenalin with no instructions visible; **58.9%** could successfully administer adrenalin after reading the instructions.
- Significantly more participants successfully gave their patient adrenalin using Emerade (100%) compared to JEXT (56.7%) or EpiPen (23.3%) (all p<0.001).
- Participants also took significantly less time to administer adrenalin with Emerade, compared to JEXT, or EpiPen (p<0.001).

Discussion

- In this simulated emergency situation participants found it difficult to read and act on written instructions.

Discussion

- This is likely to be more pronounced in a real emergency where an AAI might be used by someone with little or no training.
- Instructions on JEXT and EpiPen were confusing and skim read by participants, thus they missed important information.
- Emerade was reported to be easy to use both with and without instructions and pictures were easy to follow.
- Instructions on AAIs need to be simplified with less complicated designs.

	EpiPen (n=30)	JEXT (n=30)	Emerade (n=30)
	n (%)	n (%)	n (%)
Successful administration			
Without instructions	0	2 (6.7)	23 (76.7)***
With instructions	7 (23.3)	17 (56.7)	30 (100)***
Time taken to give AAI – all attempts (seconds)	Mean (SD)	Mean (SD)	Mean (SD)
Without instructions	14.08 (12.67)	12.02 (7.48)	10.05 (4.25)***
With instructions	33.73 (19.41)	29.21 (12.03)	14.73 (3.73)***
Score out of 5 for use of the AAI	Mean (SD)	Mean (SD)	Mean (SD)
Without instructions	.47 (.63)	.80 (1.01)	3.43 (1.33)***
With instructions	2.37 (1.43)	3.45 (1.68)	4.83 (.38)***



Acknowledgement

We would like to thank iMed Systems for part funding this project.

Contact

Dr Rebecca Knibb Email: r.knibb@aston.ac.uk Tel: 0121 204 3402

Preference for Adrenalin Auto-Injector for Use in an Emergency Situation by Non-allergic Adults:

A Comparison of JEXT, EpiPen, Emerade and Auvi-Q

Rebecca C Knibb, Kirsty Morton,
Aston University, Birmingham, U.K.

Introduction

- Being able to use an adrenalin auto-injector (AAI) properly in an emergency situation is vital when treating someone suffering from anaphylactic shock.
- Research has shown that nearly half of untrained participants are unable to correctly use an AAI training device after instruction.
- AAIs should therefore have an easy to use design and instructions should be very clear.

Aim

This study aimed to assess preference for AAIs in non-allergic adults with no training in their use.

Methods

Participants (90 adults) were shown JEXT, EpiPen, Emerade and Auvi-Q trainer pens and how to use them.

Participants were interviewed about their thoughts on each pen and they then rated their preferences for each for: ease of use, clarity of instructions, size and shape, preference for carrying them and preference overall.

Results

- Significantly more participants preferred Emerade overall (74.4%), compared to Auvi-Q (15.6%), JEXT (5.6%) and EpiPen (4.4%), $p < 0.001$.
- Emerade was rated as having the best method of instruction, clearest instructions to follow, easiest to use and the one most people would like to carry (all $p < 0.001$).
- Auvi-Q had the best size, but not the best shape, due to concerns people would not recognise it as an adrenalin pen in an emergency.
- In rating each pen out of 30 for preference Emerade was rated higher (mean 23.46) than Auvi-Q (17.76), JEXT (15.0) or EpiPen (14.38), $p < 0.001$.

Discussion

- In this sample of untrained adults, AAI preference was for a simple design which is intuitive to use with clear easy to see pictorial instructions, such as provided by Emerade.
- It is likely that someone with no or little training in use of an AAI would be required to use it in an emergency and this type of design may facilitate the administration of adrenalin to a patient in such a situation.

Preferences (%)	EpiPen	JEXT	Auvi-Q	Emerade
Method of instruction	6.7	4.4	23.3	65.5***
Clearest instructions	6.7	7.8	17.8	67.8***
Most like to carry	6.7	8.9	18.9	65.9***
Best size	2.2	22.2	63.3***	12.2
Best shape	8.9	17.8	33.3	40.0***
Easiest to use	1.1	5.6	17.8	75.6***
Easiest to carry	1.1	10.0	68.9***	20.0
Device prefer overall	4.4	5.6	15.6	74.4***



*** $p < 0.001$

Acknowledgement

We would like to thank iMed Systems for part funding this project.

Contact

Dr Rebecca Knibb Email: r.knibb@aston.ac.uk Tel: 0121 204 3402