SHORT REPORT

Adrenaline autoinjectors and schoolchildren: a community based study

T P Blyth, R Sundrum

Arch Dis Child 2002;86:26-27

Sixty schoolchildren prescribed adrenaline autoinjectors were identified by surveying schools in Hounslow, London; the 25 families who consented were interviewed. There was inconsistency in prescription and use of autoinjectors with poor training, absence of written instructions, and lack of follow up. It is recommended that national guidelines should be developed.

Use of adrenaline autoinjectors is emphasised in the management of anaphylaxis. There is debate about whether too many autoinjectors are being prescribed,¹ and whether they are used correctly.²⁻⁴

Previous studies have focused on children attending tertiary allergy clinics. Our aim was to obtain information about all schoolchildren using adrenaline autoinjectors.

METHODS

Questionnaires were sent to all schools in the London Borough of Hounslow. A representative of each school was asked to indicate the number of children with an adrenaline autoinjector and to give these children an information sheet requesting consent for interview.

We interviewed parents regarding the reasons for adrenaline prescription, indications for use, number and location of adrenaline autoinjectors, follow up arrangements, and the effect the prescription had had on the family. We also observed a demonstration of administration technique.

Approval for the study was obtained from the Hounslow Research Ethics Committee.

RESULTS

Fifty six of the 86 schools in Hounslow returned the questionnaire. The other 30 were contacted by telephone. We identified 60 pupils with adrenaline autoinjectors in the school population of 36 000. Individual schools reported between zero and

four pupils. Consent for interview was obtained from 25 families. No information was available about non-responders.

Of the 25 children interviewed, 13 were boys. Median age was 9 years (range 4-17). The median age at which the adrenaline autoinjector had been prescribed was 6 years (range 1-12). The median duration of prescription was 3 years (range 1 month to 5 years).

Sixteen children had been prescribed adrenaline for allergy to peanut (64%) and five children (20%) for allergy to tree nut. Of the children with nut allergy, 10 reported that their most severe reaction had been facial swelling, eight reported respiratory difficulty, two reported vomiting, and one had no symptoms but a positive radioallergosorbent test (RAST). Eleven of these children had coexisting asthma.

Half the children were under the care of a paediatrician at a district general hospital, a quarter were under the care of their general practitioner, and a quarter attended a tertiary allergy clinic. As table 1 shows, allergy testing and follow up were more frequent in children attending hospital clinics. Children seen in allergy clinics were prescribed more autoinjectors. Although the majority of families received allergy training, very few had a written management plan.

Three children had been prescribed an incorrect dose, in all cases because they had remained on a low dose autoinjector rather than changing to full strength when they reached 30 kg, as recommended by the manufacturer.

Table 2 summarises the knowledge of children and carers about when and how to use their adrenaline autoinjectors. Only 18 mentioned respiratory difficulty as an indication, and only six were able to demonstrate correctly on a dummy how to use their autoinjector (similar to previous studies⁵). The main areas of difficulty were not removing the cap (n = 8) and pressing on the tip to inject while holding the autoinjector against the thigh (n = 10).

Ten children had experienced further allergic reactions, of which two children received adrenaline. The first had facial swelling at a party but did not have his autoinjector. His mother brought it from home and gave it to him 30 minutes after the onset of symptoms. The second had facial swelling

Table 1 Management of children with adrenaline autoinjectors

	Place of follow up (number of children)		
	Tertiary allergy clinic (n=7)	District general hospital (n=12)	General practitioner (n=6)
Training given on use of autoinjector	6 (86%)	8 (67%)	4 (67%)
Written advice provided	2 (33%)	2 (17%)	0
Allergy tests done	7 (100%)	11 (92%)	2 (33%)
Follow up arrangements in place	5 (72%)	8 (67%)	0
Number of autoinjector prescriptions held at date of interview; median (range)*	4 (2-4)	2.5 (2-7)	2 (2-4)
Autoinjector within expiry date	6 (86%)	12 (100%)	6 (100%)
Correct dose (as per manufacturer's instructions)	7 (100%)	10 (83%)	5 (83%)

* One child had seven Epipens prescribed (3 at school, 2 at home and 2 at his grandmother's house).

Table 2 Knowledge regarding anaphylaxis

	Number (%)
Indications for administration of adrenaline autoinjector	
Face swelling	13 (52)
Breathing difficulty	18 (72)
Collapse	4 (16)
Other*	7 (28)
Child or main carer able to administer autoinjector correctly	6 (24)
Number who would call ambulance after administration	16 (64)

*Ill, 3; any reaction, 1; severe reaction, 1; pain in throat, 1; vomiting, 1.

and faintness while on holiday. The family had not brought his autoinjector, so took him to the local hospital where he was given adrenaline. The three children with wheeze used inhaled bronchodilators rather than adrenaline. The other reactions (facial swelling or rash) were controlled using oral antihistamines.

Only two schools requested further training for teachers. This may be a result of the presence of a programme of training for schoolteachers developed by the school nursing team in Hounslow.

DISCUSSION

This study was designed to identify whether there are areas of difficulty in the use of adrenaline autoinjectors prescribed to schoolchildren. For ethical reasons we did not contact families directly, but relied on them agreeing to participate on the basis of information passed to them by schools. The characteristics of the families who agreed to take part in the study are likely to be different from those who did not. Therefore we can make no conclusions about non-respondents. It is possible that they are less motivated than respondents, and therefore even less well informed. Alternatively, families who felt confident about using autoinjectors may not have responded.

The inconsistency we found in advice given to parents means that schools may have different instructions for different pupils. Widespread use of written instructions would help to decrease confusion. Ewan and Clark claim that it also prevents severe or life threatening reactions.³

The lack of follow up noted has two main consequences. Firstly, children who may have outgrown their allergies (recent studies have shown that peanut allergy may resolve with time⁶), or who were prescribed adrenaline autoinjectors for reasons that no longer warrant one are not being identified. Secondly, families are not able to have refresher training.

In summary, our study has shown that there are several areas of difficulty surrounding the use of adrenaline autoinjectors in the community. The main problems are a lack of consistency in management, problems with training, and poor follow up. We recommend development of evidence based national guidelines.

Authors' affiliations

T P Blyth, R Sundrum, Hounslow & Spelthorne Community and Mental Health NHS Trust, The Thelma Golding Centre, 92 Bath Road, Hounslow, Middlesex TW3 3EL, UK

Correspondence to: Dr R Sundrum, Hounslow & Spelthorne Community and Mental Health NHS Trust, The Thelma Golding Centre, 92 Bath Road, Hounslow, Middlesex TW3 3EL, UK; ratna.sundrum@hscmh-tr.nthames.nhs.uk

Accepted for publication 4 October 2001

REFERENCES

- 1 Unsworth DJ. Adrenaline syringes are vastly overprescribed. *Arch Dis Child* 2001;**84**:410–11.
- 2 Sicherer SH, Forman JA, Noone SA. Use assessment of self-administered epinephrine among food-allergic children. *Pediatrics* 2000;**105**:359–62.
- 3 Gold MS, Sainsbury R. First aid anaphylaxis management in children who were prescribed an epinephrine autoinjector device (Epipen). *J Allergy Clin Immunol* 2000;**106**(1 pt 1):171–6.
- 4 Pumphrey RSH. Lessons for management of anaphylaxis from a study of fatal reactions. *Clin Exp Allergy* 2000;**30**:1144–50.
- 5 Ewan PW, Clark AT. Long-term prospective observational study of patients with peanut and nut allergy after participation in a management plan. *Lancet* 2001;**357**:111–15.
- 6 Hourihane JO, Roberts SA, Warner JO. Resolution of peanut allergy: case control study. *BMJ* 1998;**316**:1271–5.