



Letter to the Editor

Accidental usage of an adrenaline auto-injector in Japanese children with a food allergy



Dear Editor,

Although the use of adrenaline auto-injectors (AAI) is indispensable for the first aid treatment of anaphylaxis, accidental injections from an AAI might injure the users.¹ We herein report the accidental usage of AAI in Japanese children.

We prescribed an AAI to a total of 466 children (male:female = 296:170) between August 2005 and April 2014. They were first prescribed at the median age of 6.0 years (25th percentile, 4.0; 75th percentile, 8.0). We held a training session once a month to prescribe the AAI, and it was mandatory for the parents with affected children to attend such a session, at least for the first prescription. The session focused on the symptoms and management of anaphylaxis, decision-making regarding AAI usage, and the safe handling and safe-keeping of the AAI. We also advised the parents to practice using an AAI repeatedly at home using a training device. We instructed the parents to contact us in cases of the accidental usage of an AAI.

During the above period, a total of 25 rescue usages of an AAI (5.36% of the prescribed children) were reported.² Six unintentional usages were also reported (1.29%, Table 1). The ethics committee of our institute approved the reporting of these cases.

The median age of the patients was 6.3 years, which was same as those of all children prescribed AAI (Mann–Whitney's U test, $P = 0.873$). The interval between the prescription and the accident ranged from 0 to 154 days (median, 100 days). The incidence of accident in the first prescribed children was 0.64% (3 of 466 children). The incidence in the repeatedly prescribed children was 3.06% (3 of 98 children), which was comparable to the former cases (odds ratio,

4.87 [95% confidential interval, 0.97–24.5]). These results showed the necessity of attention-seeking for parents at not only for the first prescription.

In the three cases (Cases 1–3), the AAI and a trainer device placed together in a bag. The child intended to simulate an injection with the actual AAI by mistake, instead of the trainer device. Two cases (Case 1 and 2) injured themselves and contacted us immediately, but the physicians judged that further treatment was unnecessary.¹ In case 3, a boy tried to apply it, but immediately let go of the device with astonishment upon hearing the sound of its operation, which fortunately resulted in no injury. In each case, the caregiver was in the same room (Case 2) or left the child alone only transiently.

A girl in case 4 shot the actual AAI by mistake on the desk, beside her parents at home. The parents had kept the AAI and the trainer device together in a bag.

The mother of Case 5 was deep in talking with a childcare worker at a nursery school, and the child handled the AAI kept in the bag behind her.

Case 6 occurred in April, soon after a boy entered an elementary school. He brought an AAI to the classroom in his bag. While the teacher was absent, he and his friends took the AAI out of the bag. One of his friends dropped it on the floor by mistake, and the device went off as a result of the impact.

These six cases suggest some common factors that can cause accidents. Firstly, in all cases, the children handled the devices when their parents were not present, or when adults were not watching. Secondly, the actual device was kept together with the trainer device, which led to the devices being mixed up (Case 1–4). Thirdly, five patients were six years of age.

Table 1

A list of six cases of the accidental usage of an adrenaline auto-injector.

No.	Age	Sex	First prescription	Hit spot	Local symptoms [†]	Location	Process	Existing person [‡]
1	4.0	Male	Yes	Thigh	Hemorrhagic macule	Home	Training	None
2	6.0	Male	No	Digit	Bleeding, hemorrhagic macule	Home	Playing	Father
3	6.7	Male	No	Thigh	None	Home	Playing	None
4	6.6	Female	Yes	Desk	N/A	Home	Training	Mother, father
5	6.0	Male	Yes	Floor	N/A	Nursery school	Playing	Mother, childcare worker
6	6.6	Male	No	Floor	N/A	Elementary school	Playing	Friends

[†] No systemic symptoms were observed. N/A, not applicable because no injection was applied to the body.

[‡] In the same room together with patient.

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In Japan, the design of the packaging of the trainer was modified in 2013 in order to distinguish it from the actual AAI device. However, in two cases (Case 2 and 3), the accidents happened even after this modification. The children might have been unable to differentiate the devices using their design or labeling. To avoid accidents caused by children, instructions about the need to keep the trainer separate from the actual AAI device should be included. Although previous studies^{3–5} have shown male children are prone to injury-risk behaviors than female children, in our cases, there was no significant sexual gap in the accident prevalence (odds ratio [male vs. female], 2.90 [95% confidential interval, 0.34–25.1]).

No accidental injections occurred in the treatment of anaphylaxis or in the usage of the device on individuals other than the patients, but a fatal case that occurred due to treatment failure from the loss of an AAI via a precursory unintentional usage was reported.¹ Recently, we have mentioned these cases in the training sessions, and specifically reminded the parents to keep the trainer away from the actual device. Owing to this revision to the lectures, no similar accidents have since been reported.

Conflict of interest

The authors have no conflict of interest to declare.

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