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Availability of epinephrine auto-injectors and knowledge of community pharmacists about their use

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To the Editor

Epinephrine (adrenaline) is the medication of choice for anaphylaxis. Epinephrine auto-injectors (EAI) are prescribed to children and adults who have experienced an anaphylactic episode (1). Patients' training by an allergy specialist is extremely important in order to help them use EAI properly and with confidence, in a future episode of anaphylaxis. Structured educational programs improve the management of anaphylaxis by patients, parents, caregivers, and health-care professionals (2). Filling an EAI prescription promptly after a medical visit is strongly advised. However, a study on filled prescriptions for EAI based on electronic medical records, showed unsatisfactory adherence (3). It seems that when a patient experiences anaphylaxis and has never acquired the prescribed EAI, or has neglected to carry it, or medication has expired, he/she could visit a community pharmacy, which is often easier and faster than driving to a Hospital Emergency Department.

Community pharmacists can play an important role by supplying EAI, offering instructions on its correct use and storage, and assisting patients who are experiencing anaphylaxis (4,5). However, it has been reported that there are gaps in pharmacists' knowledge on anaphylaxis and on EAI use (6-9). Therefore, it has been proposed that they should be appropriately trained and become able to intervene in an anaphylactic incident (10). The aim of the present study was to assess the stock of epinephrine in community pharmacies of Cyprus and to evaluate community pharmacists' knowledge on epinephrine use. Half of the community pharmacies registered in the "Nicosia-Kerynia district" of the Cyprus Pharmaceutical Association were randomly selected. The research team visited each pharmacy and invited the pharmacist on duty to participate in the study. Following a written informed consent, the research team proceeded with an interview. They were ensured about anonymity and researchers interviewed them in privacy, in order to avoid hesitation in front of pharmacies' clients. Due to our pro-

protocol and in order to preserve anonymity, no socio-demographic characteristics of the participants were kept.

The questionnaire was short in order to achieve a high response rate, and included questions that had been used in previous research in the Netherlands (6). Given that the only EAI device in Cyprus is Anapen, the brand name was used instead of EAI.

The following four questions were asked:

1. Do you have any of the following devices of epinephrine available now?
 - a. Anapen 150 µg
 - b. Anapen 300 µg
 - c. Epinephrine ampoules for medical use
2. Which is the site of application for Anapen?
3. Which Anapen dose is recommended for a child of 27 kg?
4. Are there any contraindications for the use of epinephrine in the case of anaphylaxis, or is it indicated irrespective of patient's anamnesis?

The study was submitted for approval to Cyprus National Bioethics Committee and was exempted from full Board review (decision; EEBK 2017.01.47). All analyses were conducted in Stata 14.

The research team visited 57 pharmacies. Of these, 49 accepted to participate in the study (response rate 86%). Anapen (300 µg) was available in only one pharmacy while 3 pharmacies had epinephrine ampoules. The rest of the pharmacies had no stock either of EAI or of epinephrine ampoules.

Twelve pharmacists (24.4%) correctly indicated thigh as the application site for Anapen, while two (4%) replied both thigh and deltoid muscles. Twelve pharmacists (24.4%) answered that Anapen should be used intramuscularly without indicating the application site and 15 (30.6%) did not know the answer or refused to respond. Other answers included deltoid administration (n = 2, 4%) and other / non intramuscular application (n = 6, 12.2%).

Of 34 pharmacists who answered the question about the right device for a 27 kg child, 3 indicated correctly the 300 µg device (8.8%), while the rest (91.1%) said the 150 µg one. In terms of contraindications, 18 of 30 who replied to this question (60%) answered correctly that no contraindications apply.

Eleven community pharmacists, justifying themselves for their unwillingness to reply, mentioned that knowledge on anaphylaxis and education of patients on epinephrine's use is the responsibility of the prescribing physician.

It seems that there is significant lack of knowledge on the use of epinephrine among community pharmacists in the large district of Nicosia. In addition, there was unwillingness of some community pharmacists to be interviewed or to reply to certain questions, perhaps because they thought that they were tested for their knowledge, and less that they were participating in a

scientific study with the aim of informing future policies that will benefit the population.

Deficiencies in the correct administration technique of EAI by patients, parents / caregivers, and health-care professionals (including physicians) have been recorded in many studies in the past (2,6-8,11,12). Factors that increase the correct use of EAI included patients' age over 18 years, training offered by an allergologist, prescription of an EAI for more than 30 months, anamnesis of severe anaphylaxis, and membership in a support group (11).

In an Australian study with mock patients, most of the pharmacists (who were unaware of the fact that they were assessed) demonstrated accurately the steps of safety cap's removal, the placement of the EpiPen and Anapen devices, and the injection. However, only 20% gave correct advices on what people should do after injection (7). In an online study in the Netherlands (6), the percentage of correct answers to three questions that were also used in our study (Q 2, 3 and 4) was 66.6%. The relative percentage in our study was 33.6%. A large questionnaire-based survey has also been conducted in Germany (8). A standardized written questionnaire containing items about anaphylaxis and its pharmacological treatment were handed out in person or sent by fax. The response rate was 28.5%, with pharmacists showing higher level of knowledge on anaphylaxis than on using and handling EAI (8). Pharmacists (n = 213) in that survey were also asked whether they were interested in receiving training, but only 35 replied positively (8).

In 2011, the Australasian Society of Clinical Immunology and Allergy launched the "ASCIA Anaphylaxis e-training for pharmacists". Anaphylaxis knowledge of the community pharmacists increased after the education program and remained high seven months later (4). However, teaching health-care professionals is feasible only if they are willing to be taught, which is not always true (8).

Concluding, besides patients, training on anaphylaxis and the use of EAI is very important for health-care professionals, including community pharmacists. Pharmacists should help in urgent situations like anaphylaxis and should be competent to do so. Educational programs and proper legislation adjustments that will remove barriers and encourage community pharmacists' help in certain emergencies are necessary.

Conflict of interest

Authors have no economic or other type of conflict of interest to declare, regarding the presented article.

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