The effect of an anaphylaxis guideline presentation on the knowledge level of residents

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Abstract

Objective: To determine the effects of an anaphylaxis guideline presentation in residency training, which is an important period for having skilled and knowledgable doctors in the future and see how the residents' level of knowledge changes after presentation. The study is the first in Turkey to identify ways to integrate clinical practice guidelines (CPGs) in residency training.

Methods: In this interventional study to evaluate a continuous medical education (CME) intervention without a comparison group, a clinical practice guidelines on diagnosis and management of anaphylaxis was presented to the Family Medicine and paediatrics residents at the Ankara Training and Research Hospital, by a specialist in paediatric allergy. The presentation was done within routine training sessions. A test was applied before and 10 weeks after the presentation. Electronic sources and hard copies were used for dissemination. The results were analysed with SPSS 15.0. The categorical data was analysed with Fisher's Exact test and the Mann-Whitney U test was used to compare the groups. The threshold for statistical significance was set at $P < 0.05$.

Results: The post-test scores were 58.2/100 for family physicians and 71.7/100 for paediatricians. For both pre- and post-test, paediatricians had significantly higher scores than the family physicians ($p<0.05$). On the other hand, the family physicians had significantly higher post-test scores than their own pre-test scores ($p<0.05$), while there was no significant increase in the scores of the paediatricians ($p>0.05$).

Conclusion: The study adds to limited information on the effects of clinical practice guidelines in Turkey. It shows us that the awareness of CPGs is low among physicians, and further research is needed to determine the potential role of clinical practice guidelines in continuous medical education. Physicians need a better training about how to manage anaphylaxis, and the best methods to identify their training needs must be determined.

Keywords: Anaphylaxis, Evidence based medicine, Guidelines, Primary care, Paediatrics, Turkey (JPMA 62: 102; 2012).

Introduction

Residency training is an important period for having skilled and knowledgable doctors in the future. Continuous Medical Education (CME) is very important for healthcare professionals for learning and updating their knowledge. CME must provide evidence-based knowledge that may be applied in practice. Starting in the late 20th century, there has been several studies of the practice of Evidence-based Medicine (EBM) in different countries and in different areas of healthcare.[1-4] However, the number of such studies is quite limited in Turkey and the role of EBM in healthcare practice is not widely discussed.[5-7]

Anaphylactic reactions are often life-threatening and almost always unanticipated. Any delay in the recognition of the initial signs and symptoms of anaphylaxis can result in a fatal outcome.[8] It is important for the practicing physician to have an evidence-based approach to the diagnosis and management of anaphylactic reactions in order to improve the care of patients.[9]

The study focused on the potential contribution of clinical practice guidelines (CPGs) to residency training in order to have a systematic approach of giving evidence-based clinical management of cases. The study tried to determine the effects of CPG presentation in residency training and to see how the residents' level of knowledge would change afterwards The study was the first in Turkey to identify ways to integrate CPGs in residency training.

Methods

The study was an interventional one to evaluate a CME intervention without a comparison group. Pre- and post-tests were applied to residents before and after a CPG

presentation, and results were compared.

The study was run at the Ankara Training and Research Hospital, which, is an in-service facility with 680-bed capacity and where ambulatory care is given in 225 rooms. It has over 2000 permanent staff, almost half of them being physicians. Residency trainings are given in over 15 specialties and researches, including thesis of residents, are ongoing in various fields.

This was a joint study between Family Medicine and Paediatrics departments, and was approved by the ethical committee of the hospital. The CPG was selected by organising a meeting between trainers in the paediatrics department in order to identify priority topics for residency training that had not been given during routine training sessions. A published CPG related to diagnosis and management of anaphylaxis was selected as a case.[8] Training was planned to be given by a specialist in paediatric allergy, and the presentation was to focus on the management of paediatric anaphylactic patients. Residents in Family Medicine and paediatrics are the only two groups of residents in the hospital who are expected to be in charge of paediatric care and expected to manage a paediatric anaphylactic case when it comes. All physicians under training in the two specialties were invited to participate in the study regardless of their years of training. Residents from other specialties were not included in the study.

The selected CPG was presented to 46 residents in the hospital, who agreed to join the study and signed an informed consent. Of these, 32 were Family Medicine residents (who were during their mandatory paediatrics training of 9 months), whereas 14 were paediatrics residents. The presentation included only the information in the guideline and no additional source was used or added to the content.

The pre-test was run just before the presentation and had 15 multiple-choice questions to assess the related level of knowledge of the participants. An additional questionnaire with 10 questions was also given to understand their level of use for the CPGs. Following the actual presentation, the original text, Turkish translation and PowerPoint presentation were shared on the hospital website that is commonly used by all these physicians and they were notified through email. The key points were also shared on the boards of departments in the form of brief tables or notes. No additional reminder was sent or given to the group for 10 weeks after which the group was asked to answer the same questions. Of the 46 physicians who had taken the pre-test, 38 (83%) took the post-test.

The results were analysed with SPSS 15.0. The comparisons were done in order to see the effect of training on knowledge levels of both paediatrics and Family Medicine residents. The categorical data was analysed with Fisher's Exact test and the Mann-Whitney U test was used to compare the groups. The threshold for statistical significance was set at $P < 0.05$.

Results

The first training session was attended by 46 residents who were given a pre-test before the session started. Ten weeks later, 38 (83%) of them returned for the post-test. Of these, 26 (68.4%) were family physicians, and 12 (31.6%) were paediatricians. Half of the family physicians (13) and 83.3% of the paediatricians (10) were women.

Table-1: Comparison of family physicians and pediatricians for various items.

		Family Physicians		Paediatricians		Total		P value
		n	%	n	%	n	%	
Has previously read an anapylaxis guideline	Yes	5	19.2	6	50.0	11	28.9	0.068
	No	21	80.8	6	50.0	27	71.1	
	Total	26	100.0	12	100.0	38	100.0	
Has previously read a guideline	Yes	8	30.8	4	33.3	12	31.6	>0.99
	No	18	69.2	8	66.7	26	68.4	
	Total	26	100.0	12	100.0	38	100.0	
Has previously intervened an anaphylactic reaction	Yes	10	38.5	5	41.7	15	39.5	>0.99
	No	16	61.5	7	58.3	23	60.5	
	Total	26	100.0	12	100.0	38	100.0	
Has previously recommended an auto injection	Yes	0	0.0	3	25.0	3	7.9	0.026*
	No	26	100.0	9	75.0	35	92.1	
	Total	26	100.0	12	100.0	38	100.0	
Owns a computer at home	Yes	20	76.9	10	83.3	30	78.9	>0.99
	No	6	23.1	2	16.7	8	21.1	
	Total	26	100.0	12	100.0	38	100.0	
Has internet connection at home	Yes	18	69.2	10	83.3	28	73.7	0.453
	No	8	30.8	2	16.7	10	26.3	
	Total	26	100.0	12	100.0	38	100.0	

Table-2: Comparison of pre- and post-test scores for family physicians and paediatricians.

	Groups	n	Mean	p-value
Pretest scores	Family Physicians	26	34.4 ± 13.2	0.0001
	Paediatricians	12	63.9 ± 15.2	
	Total	38	43.7 ± 19.5	
Posttest scores	Family Physicians	26	58.2 ± 15.4	0.032
	Paediatricians	12	71.7 ± 13.1	
	Total	38	62.5 ± 15.8	

Five (19.2%) of the family physicians and six (50%) of the paediatricians said that they had read an anaphylaxis CPG before. However, none of what they called a CPG was actually a defined CPG.

Ten (38.5%) of the family physicians and 5 (41.7%) of the paediatricians said that they had managed an anaphylactic reaction at least once before. None of the family physicians had prescribed an auto injection before, while 3 (25%) of the paediatricians had done so.

All participating physicians had internet connection at work. Of the family physicians, 20 (76.9%) owned a

Table-3: The comparison of true answers of family physicians and paediatricians to each question in Pre-test and Post-test.

		Family physicians		Pediatricians		Total	
		n	%	n	%	n	%
What would you expect least to happen in anaphylaxis?	Pre-test	11	42.3	9	75	20	52.6
	Post-test	16	61.5	8	66.7	24	63.2
	Change	5	19.2	-1	-8.3	4	10.6
What is the order of intervention in anaphylactic reaction?	Pre-test	7	26.9	10	83.3	17	44.7
	Post-test	21	80.8	9	75	30	78.9
	Change	14	53.9	-1	-8.3	13	34.2
What should be further investigated in history in a patient with a history of anaphylactic reaction?	Pre-test	6	23.1	7	58.3	13	34.2
	Post-test	12	46.2	10	83.3	22	57.9
	Change	6	23.1	3	25	9	23.7
If there is insufficient clinical response to intervention in anaphylactic reaction. which treatment approach would you choose as the next step?	Pre-test	9	34.6	10	83.3	19	50
	Post-test	16	61.5	10	83.3	26	68.4
	Change	7	26.9	0	0	7	18.4
In which of the following cases would you prefer to refer the patient with a history of anaphylactic reaction to an allergist-immunologist?	Pre-test	20	76.9	10	83.3	30	78.9
	Post-test	20	76.9	9	75	29	76.3
	Change	0	0	-1	-8.3	-1	-2.6
Which of the following is a sign of vasovagal reactions and not of anaphylaxis?	Pre-test	8	30.8	6	50	14	36.8
	Post-test	11	42.3	7	58.3	18	47.4
	Change	3	11.5	1	8.3	4	10.6
Which tests would you think of asking for differential diagnosis of anapylaxis?	Pre-test	8	30.8	1	8.3	9	23.7
	Post-test	5	19.2	3	25	8	21.1
	Change	-3	-11.6	2	16.7	-1	-2.6
Which is false regarding hypotension values of an anaphylactic paediatric patient?	Pre-test	9	34.6	6	50	15	39.5
	Post-test	16	61.5	8	66.7	24	63.2
	Change	7	26.9	2	16.7	9	23.7
In case the anaphylactic patient experiences cardiac arrest. what would be the rate of epinephrine infusion?	Pre-test	5	19.2	10	83.3	15	39.5
	Post-test	12	46.2	6	50	18	47.4
	Change	7	27	-4	-33.3	3	7.9
In case of hypotension during anaphylactic reaction what would be the rate of dopamine infusion?	Pre-test	8	30.8	9	75	17	44.7
	Post-test	13	50	11	91.7	24	63.2
	Change	5	19.2	2	16.7	7	18.5
In which of the following cases your diagnosis would definitely be anaphylaxis?	Pre-test	9	34.6	5	41.7	14	36.8
	Post-test	16	61.5	9	75	25	65.8
	Change	7	26.9	4	33.3	11	29
Which of the following would not be recommended in training of the patient with a history of anaphylaxis?	Pre-test	14	53.8	11	91.7	25	65.8
	Post-test	21	80.8	12	100	33	86.8
	Change	7	27	1	8.3	8	21
What would be the primarily recommended route for adrenaline in anaphylactic reaction?	Pre-test	4	15.4	8	66.7	12	31.6
	Post-test	18	69.2	12	100	30	78.9
	Change	14	53.8	4	33.3	18	47.3
What would be the rate of epinephrine infusion in an anaphylactic patient?	Pre-test	7	26.9	8	66.7	15	39.5
	Post-test	14	53.8	7	58.3	21	55.3
	Change	7	26.9	-1	-8.4	6	15.8
In which cases further tests (in vitro. skin tests etc) are not indicated in patients with history of anaphylaxis?	Pre-test	9	34.6	5	41.7	14	36.8
	Post-test	16	61.5	8	66.7	24	63.2
	Change	7	26.9	3	25	10	26.4

computer at home, while 18 (69.2%) also had internet connection. Ten (83.3%) of the paediatricians owned a computer at home and had internet connection (Table-1).

The average pre-test score for family physicians was 34.4 ± 13,2/100 while it was 63.9 ± 15.2/100 for paediatricians. The post-test scores were 58.2 ± 15.4/100 and 71.7 ± 13.1/100 respectively. For both pre- and post-test, paediatricians had significantly higher scores than the family physicians ($p<0.05$) (Table-2). On the other hand, the family physicians had significantly higher post-test scores than their own pre-test scores (p=0,0001), while there was no significant increase in paediatrician test scores (p=0,121) (Table-3).

Three (11.5%) of the family physicians and 1 (8.3%) paediatrician said that they had read the documents on the website after the presentation and 15 (57.7%) and 9 (75%) respectively had read the notes on the boards. For both web and board use, the differences between physician groups were not significant (p=1 and p=0,472 respectively).

During the 10 weeks between the two tests, 1 (3.8%) family physician and 1 (12.5%) paediatrician (at the same emergency shift) came across a case of anaphylactic reaction.

Discussion

This was the first study about the integration of CPGs into residency training in Turkey, and identified the role of CPGs in improving evidence-based practice by the residents in Family Medicine and paediatrics. Literature search did not reveal any Turkish study on evidence-based practice of residents. However, studies related to knowledge levels of residents are available, though limited, in subjects such as basic life support or disaster preparedness.[10,11] The studies on the quality of residency training is limited as well; the one encountered during literature search was related to urology.[12]

The effective introduction of CPGs could be considered an assurance of quality improvement. However, it is also emphasised that even well-constructed guidelines have little effect unless supported by dissemination and implementation strategies.[13] A review of such strategies by Grimshaw reports that changes in practitioner behaviour in the desired direction were reported in 86% of the comparisons made. The median effect size overall was approximately 10% improvement in absolute terms. The review suggests that interventions that were previously thought to be ineffective (e.g., dissemination of educational material) may have modest but worthwhile benefits. Also, multifaceted interventions, previously thought to be more effective than single interventions, were found to be no more effective than the former.[14,15] Also reported by the same author is the ineffectiveness of the dissemination of printed educational material and didactic (as opposed to interactive) educational sessions.[16]

A survey to estimate the feasibility and likely resource requirements of guideline dissemination and implementation strategies in UK settings was carried out with key informants from primary and secondary care.[14] The respondents thought that only dissemination of educational material and short (lunchtime) educational meetings were generally feasible within their actual resources. The current residency training in our setting was already being organised as a short lunchtime meeting. Additionally, the material was disseminated, which was not routine in other trainings. At this stage we preferred to use visual and hard-copy dissemination plus electronic sources. This also gave us some idea about the use of sources. In our study, 3 (11.5%) of the family physicians and 1 (8.3%) paediatrician said that they read the documents on the website after the presentation, and 15 (57.7%) and 9 (75%), respectively, read the notes on the boards. Kahveci reports that only 4,9% of family medicine residents in Turkey spend more than 7 hours per week on internet for medical use, whereas 7,4% spend no time at all.[17] On the other hand, our study showed that reading the notes on the boards was the preferred way.

Kahveci reports that 56,7% of family physicians say that they often used CPGs as a resource to support their clinical decisions.[17] However, it is well noticed in this study that the awareness about CPGs is very low among residents.

Ten (38.5%) of the family physicians and 5 (41.7%) of the paediatricians said that they had to intervene an anaphylactic reaction at least once before. So we could consider that anaphylaxis is an equally encountered problem for both groups of physicians and equally important. But the study showed that the knowledge of the physicians before guideline presentations were rather disappointing (34.4/100 for family physicians and 63.9/100 for paediatricians). The reasons for such a low level of knowledge for an important, life-threatening situation must also be investigated separately. This also raised a question about the quality of Family Medicine residency period, and the coverage of necessary topics during their training.

There are a number of possible limitations in the study. First, the questions asked to the residents only assessed their theoretical knowledge and the actual effect on the behaviour changes could not be assessed. The literature review did not reveal any Turkish study on behavioural changes after CPG dissemination. Second, the study only assessed the effect of an intermediate intensity dissemination route on knowledge level of the residents and did not allow comparison with different dissemination

routes and their effects. Third, the study also did not allow comparison between a CPG presentation and the traditional way of didactic presentation of narrative reviews. Fourth, the study was limited to a research hospital in Ankara and cannot be generalised. However, the strength of the study is that it reached almost all residents in the target clinics and, hence, had a good representation of the target group. The study is also a good basis for organising future research on the role of CPGs in CME, which was an unexplored area in Turkey. The health services research finding of the failure of research findings getting translated into daily practice[1] should encourage people to further investigate ways to increase the uptake of research findings by physicians and end up with actual behaviour change in our settings, which has been weakly studied in Turkey.

Anaphylaxis is the maximal variant of an acute life-threatening immediate-type allergy. Due to its often dramatic onset and clinical course, practical knowledge in the management of these reactions is mandatory both for physicians and patients.[18]

Conclusions

The value of the study, despite its limitations, is that it adds to limited information on the effects of CPGs in Turkey. It shows that the awareness of CPGs is low among physicians, and further research is needed to determine the potential role of CPGs in CME which would help integrate CPGs into residency training in order to have a better translation of research findings into actual practice. The physicians need a better training about how to manage anaphylaxis, and the best methods to identify their training needs must be determined.

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