

Evaluation of animated cartoon-aided teaching of intranasal corticosteroid administration technique among Thai children with allergic rhinitis

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Summary

Background: Correct use of intranasal corticosteroid (INCS) and compliance with treatment is very important for the treatment of allergic rhinitis (AR). An animated cartoon-aided teaching method for INCS administration was created to decrease the workload of health care professionals. The aim of this study was to compare the performance of children with AR in using INCS between a group who were instructed using animated cartoon-aided teaching and those receiving only an oral presentation without demonstration.

Methods: The study was a prospective randomized controlled trial in children aged 5 – 16 years with moderate to severe intermittent or persistent AR who had never used INCS. The patients were randomly divided into 2 groups; 1) those receiving teaching about how to use INCS by an oral presentation without demonstration and 2) by animated cartoon-aided teaching. The performance of the children was recorded after the initial training using a five-point checklist. If they were unable to use the INCS correctly after the first teaching session, the same instructions were repeated and a second assessment was performed.

Results: A total of 80 patients, 40 each group, underwent randomization. The rate of achieving competency for the patients after the first instruction using the animated cartoon-aided teaching group was significantly higher than that

for the oral presentation group (57.5% VS 27.5%; $P = 0.007$). The cumulative success rate for the second assessment of the animated cartoon-aided group was also significantly higher than for those receiving only an oral presentation (95% VS 60%, $P = 0.004$).

Conclusion: With regard to mastering the correct method for INCS usage, instruction using animated cartoon-aided teaching is better than oral presentation without demonstration. However, the best method for teaching patients how to use INCS is a combination of oral explanation and demonstration by cartoon-aided teaching. The teaching should be repeated periodically to remind patients of the correct method for INCS usage. (*Asian Pac J Allergy Immunol 2013;32:166-70*)

Key words: cartoon-aided teaching, allergic rhinitis, intranasal corticosteroid, spray technique

Abbreviations

AR = allergic rhinitis
INCS = Intranasal corticosteroid
HCPs = health care professionals

Introduction

The incidence of allergic rhinitis (AR) is increasing all over the world. The incidence of AR in Thailand was 23% in 1975.¹ In 1998, the incidence of AR in Bangkok was 42.2% in children aged 6-7 years and 38.7% in children aged 13-14 years.² In the Northeastern part of Thailand, the incidence was 42.6% in children aged 6-7 years and 33.3% in children aged 13-14 years.³ The complications that can lead to significant problems both physically and mentally in the child who suffers from AR include otitis media, sinusitis, snoring, poor school performance, sleep disturbance and hyperactivity.^{3,4} Children with AR show

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significantly lower preference to participate in skill-based, social and leisure activities compared to their healthy peers.⁵ Intranasal corticosteroid (INCS) is the main medication in the treatment of mild to severe persistent and moderate to severe intermittent AR.⁶⁻⁸

The efficacy of INCS depends on compliance and correct INCS usage. In most of the out-patient units and allergy clinics in Thailand, health care professionals (HCPs) are the ones who inform patients how to use INCS. These teaching processes take time and the approach used differs among HCPs. For these reasons, the animated cartoon aided teaching of INCS administration has been created to decrease the workload of HCPs in teaching the correct method of INCS administration to AR children. It should also help, to standardize methods of INCS usage between different presentation times and HCPs. The advantages of the animated cartoon-aided teaching are repeatability, consistency and that it is more interesting for children.

The aim of this study was to compare the performance of the children with AR in using INCS between a group which was instructed by animated cartoon-aided teaching and another who received an oral presentation without demonstration.

Methods

The study was approved by Institutional Ethics Committee and the written informed consent obtained from the parents before enrollment of the study. This study was a prospective, randomized controlled trial in children aged 5-12 years who were diagnosed as having AR by an allergist and had never used INCS. Patients who had other systemic diseases, such as systemic *lupus erythematosus* (SLE) and chronic lung disease, were excluded. The authors created an animated cartoon video that included the definition, clinical features and the treatment of AR, allergen avoidance and the method of INCS usage. To evaluate the correct method of INCS usage, a 5-step-checklist was created and validated. These 5 steps of INCS usage were: first, shake the bottle and then open the cap; second, if this usage was the first time or the usage was stopped for more than two weeks, a priming spray should be carried out before use; third, insert the tip of bottle into each nostril and slightly bend the face forward; fourth, spray the medication into each nostril with the tip of the bottle pointing to the

medial corner of each eye on the same side; fifth, avoid blowing the nose and brush teeth or wash mouth a few minutes after (to get rid of residual corticosteroid in the mouth and throat). This animated cartoon took 6 minutes which was the same time as conventional oral teaching by HCPs. The same information, including the 5 steps of how to use INCS, were taught to the patients in both groups. The patients in animated cartoon-aided teaching group were taught with only animated cartoon-aided teaching (without oral presentation or demonstration). There were two validated HCPs who taught the patients by oral presentation, without video demonstration. However, they were allowed to use body language. Patients that fulfilled the inclusion criteria were recruited and randomized (based on research randomizer, www.randomizer.org) into 2 groups. The general characteristics of the subjects, such as age, sex, onset of AR, other atopic diseases and severity of AR, were recorded.

Competency was considered to have been achieved when the patients could correctly perform all five-points on the checklists after the presentations. The five-point checklists were evaluated by only one investigator who did not know which method of teaching the subjects had received. If they were unable to use INCS correctly, the same instructions were repeated and a reassessment was performed. The primary outcome was to compare the achievement of competency in using INCS for all 5-steps on the checklist between the group of AR children who were instructed by animated cartoon-aided teaching and those who received an oral presentation without video demonstration. The studying schedule is shown in Figure 1. If any patients still were unable to use INCS correctly at the reassessment, HCPs would demonstrate to them how to use INCS until they could perform all the five-point checklists correctly.

Statistical analysis

An independent t-test was used to evaluate the difference between the general characteristics of the two groups. These results were presented as mean \pm standard deviation (SD). A *p* value of less than 0.05 was considered statistically significant. The χ^2 test was used to compare the achievement of all five-point checklists between the oral presentation and animated cartoon-aided teaching groups. These results were presented as *p*-value, odd ratio (OR) and 95% confidence interval.



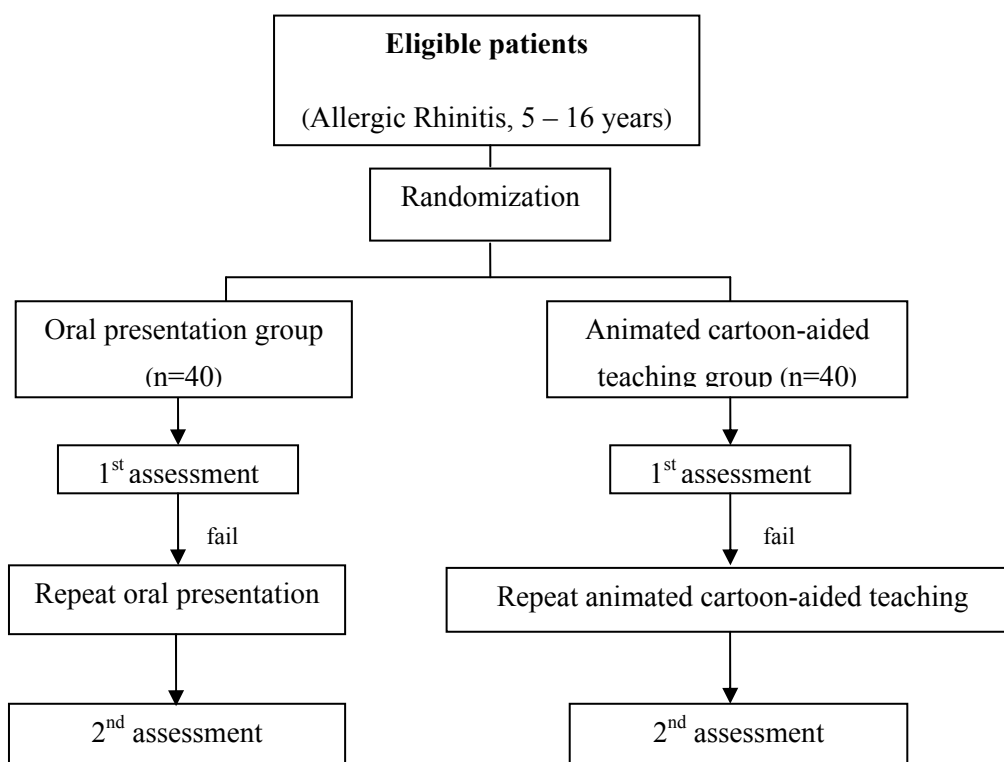


Figure 1. Steps in randomization and assessment of the administration methods of intranasal corticosteroid.

Results

A total of 80 patients participated in this study, 40 patients in each group. There were no statistically significance differences in general characteristics between the two groups, except a significantly higher number of males in animated cartoon-aided teaching group as compared with the oral presentation without demonstration group ($p = 0.01$), as shown in Table 1. The percentage of individuals achieving competency after the first instruction using the animated cartoon-aided teaching was significantly higher than that for the oral presentation group (57.5% vs 27.5%, $p = 0.007$; OR=3.6, 95%CI=1.4-9.1). The cumulative percentage of achieving competency following the second presentation of the animated cartoon-aided teaching group was also significantly higher than that for the oral presentation group (95% vs 60%, $p = 0.004$; OR=12.7, 95% CI=2.7-60.1). (Figure 2) The increased percentage of achieving competency between the 1st and 2nd assessment of both groups was not significantly different (32.5 % in the oral presentation group and 37.5 % in the animated cartoon-aided teaching group).

The most common error following the 1st assessment was in step 2 in both groups (40% in the oral presentation group and 30% in the animated

Table 1. Compare general characteristics between the subjects in oral presentation and in animated cartoon-aided teaching groups.

Characteristics	Oral presentation (n=40)	Animated cartoon-aided teaching (n=40)	p value
Age (years)	8.7±3.1	8.6±2.6	0.85
Male gender	20 (50%)	31 (77.5%)	0.01
Age of onset (years)	4.7±3.2	4.7±2.8	0.97
Severity of AR			
- Moderate to severe	3 (7.5%)	7 (17.5%)	0.17
- Mild persistent	9 (22.5%)	4 (10%)	
- Moderate persistent	19 (47.5%)	15 (37.5%)	
- Severe persistent	9 (22.5%)	14 (35%)	
Other atopic diseases	29 (72.5%)	33 (82.5%)	0.29
Family history of atopy	25 (62.5%)	25 (62.5%)	1

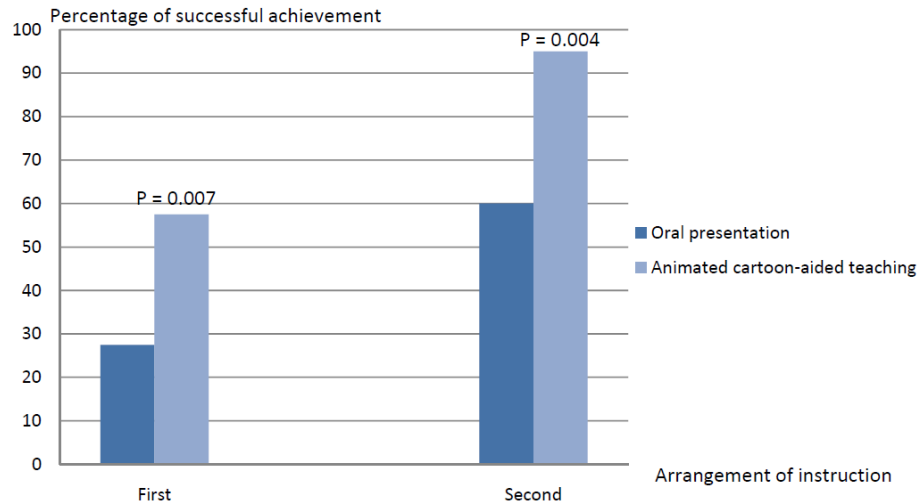


Figure 2. Compare percentage of successful achievement of the patients after the first and the second instruction (cumulative) between oral presentation and animated cartoon-aided teaching groups.

cartoon-aided teaching group, Figure 3). The percentage of errors in steps 1 to 5 in the 1st assessment of the oral presentation group were 25, 40, 35, 37 and 22%, respectively, while those of the animated cartoon-aided teaching group were 12, 30, 7, 12 and 12%, respectively. The most common error in the 2nd assessment was found in step 4 in both groups (25% in the oral presentation group and 5% in the animated cartoon-aided teaching group, Figure 4). The errors in steps 1 to 5 in the 2nd assessment of the oral presentation group were 12, 17, 10, 25 and 2%, respectively, while those of the animated cartoon-aided teaching group were 0, 2, 0, 5 and 0%, respectively. There was no significant difference in age or sex between the cases that had successfully achieved competency in the first and the second assessment and those who did not.

Discussion

The characteristics of the patients were not different between the study groups, except for the higher number of males in the animated cartoon-aided teaching group. In general, girls perform better than boys. In our study, there were more boys than girls in the animated cartoon-aided teaching group but, despite this, the achievement of competency in this group was better than in the oral presentation group. Age, which is the most important characteristic that could affect the learning ability, was not different between the groups. Our study showed that children in the animated cartoon-aided teaching group achieved competency in the correct method of INCS usage more frequently than those in the oral

presentation group. This finding is similar to that reported by Leiner et al.⁹, who conducted a randomized controlled trial about informing the carers of children about receiving polio vaccine in pediatric clinic, comparing animated cartoon-aided teaching and reading a printed vaccine information sheet. The carers were assessed using five questions related to the understanding of the polio vaccine and the post-test changes in knowledge scores were significantly greater in the animated cartoon group compared to the data sheet only group. Delp and Jones¹⁰ performed a prospective, blinded, randomized, controlled study to compare wound care instructions with cartoon and without cartoons. The results showed that cartoon illustrations were an effective strategy for conveying information and may improve patient compliance.

The achievement of competency at the 2nd assessment after repeated animated cartoon-aided teaching was 95 %. This means that competency can increase after repeating animated cartoon-aided teaching. It is useful to show the animated cartoon-aided teaching to allergic rhinitis patients while they are waiting for the doctor and for medicines. This animated cartoon-aided teaching method is also useful in community hospitals where there are too many patients and limited number of HCPs. The advantages of this method are that it is repeatable, consistent, interesting and also useful for patients who cannot read. Patients also can study the cartoon-aided package by themselves.

The most common error in the first assessment in both groups was in step 2: “if this usage was the first



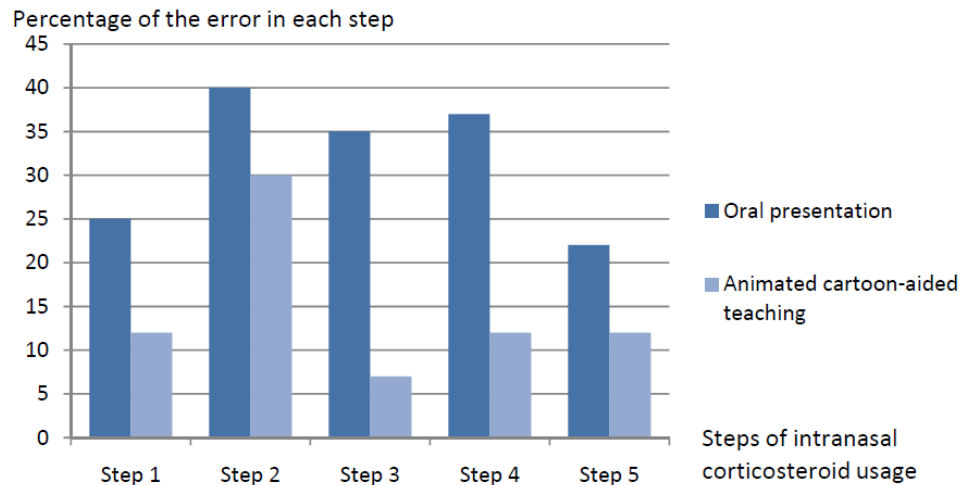


Figure 3. Percentage of the error in each step in the 1st assessment between oral presentation and animated cartoon-aided teaching groups.

time or the usage was stopped for more than two weeks, spray it before usage". This was because step 2 was not a step that patients did in every occasion that they used the spray. In the second assessment, step 4 "spray it into each nostril with the tip of bottle point to medial corner of each eye on the same side" was the most common error in both groups and was the step that the patients found confusing. The best method for teaching patients how to use INCS is the combination of oral explanation and demonstration by cartoon-aided teaching. This teaching should be repeated periodically to remind patients of the correct method of INCS usage.

Conclusion

With regard to the correct method of INCS usage, instruction by using animated cartoon-aided teaching is better than oral presentation without demonstration. However, the best method for teaching the patients how to use INCS is a combination of oral explanation and demonstration by cartoon-aided teaching. These teachings should be repeated periodically to remind patients about the correct method of INCS usage.

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