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The effect of performing istinsyaq on the degree of nasal obstruction in allergic rhinitis

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ABSTRACT

Background: Allergic rhinitis (AR) is an inflammation of the nasal mucosa that affects 30% of the world's population. A study showed that istinsyaq can reduce the degree of nasal obstruction. **Objective:** To determine the effect of performing istinsyaq in wudhu on the degree of nasal obstruction in patients with allergic rhinitis. **Method:** This study was a pre-experimental with one group pretest-posttest design. The population is class X and XI students at Imam Syafi'i IT High School in Batam City, for the 2020-2021 academic year, who suffered from AR and were willing to participate. AR was screened using the score for AR (SFAR) questionnaire and the degree of nasal obstruction was assessed using the nasal obstruction symptom evaluation (NOSE) questionnaire. **Results:** The sample obtained was 24 students. The average total NOSE score before istinsyaq treatment education was 30 ± 18, and after istinsyaq treatment on the 14th day it decreased to 21 ± 18, and on the 28th day it decreased to 14 ± 16. There was a significant decrease in the average total NOSE score using the Wilcoxon test, namely the p value (0.019) < 0.05 on the 14th day, and p value (0.002) < 0.05 on the 28th day after istinsyaq treatment. **Conclusion:** In conclusion, istinsyaq could reduce the average total score of the NOSE questionnaire in students with allergic rhinitis. Istinsyaq is effective in reducing the degree of nasal obstruction in patients with AR.

Keywords: *istinsyaq*, allergic rhinitis, Score For Allergic Rhinitis, Nasal Obstruction Symptom Evaluation

ABSTRAK

Latar belakang: *Rinitis alergi (RA) adalah inflamasi mukosa hidung yang megenai 30% populasi dunia. Sebuah penelitian menunjukkan bahwa istinsyaq dapat mengurangi derajat sumbatan hidung.* ***Tujuan:*** *Untuk mengetahui pengaruh melakukan istinsyaq dalam wudhu terhadap derajat sumbatan hidung pada penderita RA.* ***Metode:*** *Jenis penelitian ini adalah pre-eksperimental dengan desain one group pretest-posttest. Populasi adalah siswa kelas X dan XI di SMA IT Imam Syafi'i Kota Batam, tahun ajaran 2020-2021, yang menderita RA dan bersedia untuk berpartisipasi. Skrining RA menggunakan kuesioner* Score for Allergic Rhinitis (SFAR) *dan derajat sumbatan hidung dinilai dengan menggunakan kuesioner* Nasal Obstruction Symptom Evaluation (NOSE). ***Hasil:*** *Didapatkan sampel berjumlah 24 siswa. Rata-rata skor total* NOSE *sebelum edukasi perlakuan istinsyaq adalah 30 ± 18, dan setelah perlakuan istinsyaq di hari ke-14 menurun menjadi 21 ± 18, dan di hari ke-28 menurun lagi menjadi 14 ± 16. Didapatkan penurunan bermakna rata-rata skor total* NOSE *dengan menggunakan uji* Wilcoxon *yaitu nilai* p value *(0,019) < 0,05 di hari ke-14, dan nilai* p value *(0,002) < 0,05 di hari ke-28 setelah perlakuan istinsyaq.* ***Kesimpulan:*** *Istinsyaq dapat menurunkan rata–rata total skor kuesioner* NOSE *pada siswa dengan RA. Dengan demikian, istinsyaq efektif untuk mengurangi derajat sumbatan hidung pada penderita RA*

Kata kunci: istinsyaq*, rinitis alergi, Score For Allergic Rhinitis, Nasal Obstruction Symptom Evaluation*

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INTRODUCTION

The nose is an anatomically complex structure. The shape of nose forms depends on nasal bone and cartilage which separates the nasal cavity into two. The nasal septum is in the midline of the nose and made of flat cartilage anteriorly and bone posteriorly.[1] The nose has several functions i.e. smelling, sneezing and air cleansing through defense mechanism known as nasal mucociliar transport.[2]

The nasal mucosa, histologically is composed by mucous blanket, ciliated pseudostratified columnar epithelium, basalis membrane, and lamina propria. Lamina propria is comprised by subepithelial gland layers, media and profunda gland.[3] The nasal mucociliary transport is a first-line defense of the respiratory tract that depends on the synergy between mucous blanket and cilia.[2]

Several factors influencing the nasal mucociliary transport are physiological or physical factors, air pollution and smoking, congenital disease, infection, topical and systemic medicines, anatomical structure, and allergic rhinitis.[3]

Allergic Rhinitis (AR) is an inflammation of nasal mucosa, it is caused by hypersensitivity type one mediated by immunoglobulin E (Ig-E) against inhaled antigens in the air.[3,4]

AR signs and symptoms were characterized by nasal congestion, sneezing, reddish eyes, itching and swelling around the eyes. The allergen could increase Ig-E level inducing a large amount of mast cell degranulation, that release inflammation mediators such as histamine and cytokine, which inciting local inflammation reaction.[5] Epidemiologically, AR affects 30% of the world's population.[5-10] Prevalence AR in Indonesia was 1.5-12.4% and still increasing each year. AR usually occurs at young age.[11,12]

A study ascertained that Score for Allergic Rhinitis (SFAR) questionnaire could be used as a substitute for Skin Prick Test (STP) in diagnosing AR due to accuracy on both positive significant correlations.[13]

Nasal rinsing is a personal hygiene practice in which the nasal cavity is washed with saline solution. Nasal irrigation is recommended by primary doctors and Ear-Nose-Throat specialists as part of acute as well as chronic AR therapy.[14]

Nasal irrigation could enhance the function of nasal mucosa through several physiological effects such as flushing out mucus and crusts mechanically, increasing mucus cleansing, improving cilia activity, enhancing the hydration of mucous blanket lowest layer, and furthermore antigen, biofilm, and inflammation mediator cleansing.[15-17]

Nasal rinsing as seen from the Islamic point of view is known as *istinsyaq,* which is a *'sunnah'* (a prophetic tradition) from the prophet Muhammad *shalallahu 'alaihi wassalam*, in doing *'wudhu'* as an activity prior to worshipping the Almighty. It is inseparable for muslims, quoted from Abu Hurairah RA: "if any of you is doing *wudhu*, make sure that you inhale water inside your nose (*istinsyaq*), and afterwards flush the water out *(istintsar*)" (*hadith Bukhari*).[17-18]

The result of a study on male pilgrimage from Malaysia showed that nasal rinsing known as *istinsyaq*, significantly had decreased coughing, rhinorrhea, and nasal congestion. *Istinsyaq* did not affecting fever. Thus, it revealed that *istinsyaq* only could not prevent upper respiratory infection, such as viral pharyngitis and aspiration pneumonia. A

combination for preventing upper respiratory tract infection i.e. vaccination, *istinsyaq,* and wearing face mask had proven to be more effective.[17] The authors herewith obtained a hypothesis that education on performing *istinsyaq* could decrease nasal congestion in AR patients. The hypothesis was proven with a study on male pilgrimages from Malaysia who performed *istinsyaq* and had decreased nasal congestion symptoms.[17] The authors of this research would like to learn the effect of *istinsyaq* during *wudhu* to irrigate the nose of AR patients of Islamic Alkahfi Kota Batam Foundation using Nasal Obstruction and Symptom Evaluation (NOSE) questionnaire.

The purpose of this study was to find out whether education on performing *istinsyaq* could decrease nasal congestion in AR patients.

METHOD

This was a pre-experimental study with one group pretest-posttest design, executed without comparing any groups. First, AR screening was performed using SFAR questionnaire.

The researchers would like to know the effect of *istinsyaq* during *wudhu* as nasal irrigattion on Islamic AR subjects in Batam city, using Nasal Obstruction and Symptom Evaluation (NOSE) questionnaire, whether it could decrease their nasal congestion.

The researchers wanted to find out the score result of NOSE questionnaire of AR patients after being taught the *istinsyaq* ritual for 28 days. *Istinsyaq* was perfomed 5 times daily in accordance with 5 times *wudhu*, prior to obligatory Islamic worshipping the Almaghty pray (*shalat*).

The research population was class X and XI students of Imam Syafi'i High School, in Batam City, of the 2020-2021 academic year. Inclusion criteria were students who were AR sufferers, and were willing to participate, had filled in the questionnaire completely, and have SFAR value 7.

Test Shapiro-Wilk was applied to know whether the data was normally distributed. The value of $p<0.05$ showed that data was not normally distributed, while $p>0.05$ showed that data was normally distributed. Wilcoxon test was used should the data was not normally distributed, and t-paired test was applied for normally distributed data. If $p<0.05$, the result was significantly correlated.

The aim of this study was to compare NOSE questionnaire score prior to educating, and score after day 14th. Another comparison was to compare NOSE questionnaire score prior to educating, and score after day 28th.

The ethical clearance number of this study was 342/UN.16.2/KEP-FK/2021, and the authoritative institution to declare the ethic approval was the Faculty of Medicine Andalas University.

RESULT

This study was conducted online at Imam Syafi'i IT High School in Batam City based through Google Form, due to government regulation called Enforcement of Community Activity Restriction as a Covid-19 pandemic prevention.

The data in this research was primary data taken directly as pretest and posttest from respondents. Inclusion criteria were all students from class X and XI at Imam Syafi'i IT High School in Batam City of the 2020-2021 academic year who suffered from AR and were willing to participate.

To all repondents, the NOSE score measurement was executed prior and after the education of doing five times a day *istinsyaq,* in 28 days.

Data was analyzed by comparing the NOSE score prior to educating and the NOSE score after *istinsyaq* education on day

14th; and also by comparing the NOSE score prior to educating and the NOSE score after *istinsyaq* education on day 28th. From 33 AR sufferers, 9 subjects dropped out leaving 24 subjects who had completely filled in the questionnaires 3 times daily, and submitted their daily report of *istinsyaq* in 28 days.

Table 1. NOSE score difference prior to educating *Istinsyaq* and after educating *Istinsyaq* on day 14th

First measmnt data	Mean	Stndrd deviatn	Maximum value	Minimum value
NOSE score prior to educating *istinsyaq*	30	18	65	5
NOSE score after day 14th	21	18	65	0

Table 2. NOSE score difference prior to educating Istinsyaq and after educating *Istinsyaq* on day 28th

Second measmnt data	Mean	Stndrd deviatn	Maximum value	Minimum alue
NOSE score prior to educating *istinsyaq*	30	18	65	5
NOSE score after day 28th	14	16	55	0

Showed on Table 1, the data obtained from the first measurement of the average total NOSE score of AR subjects prior to educating *istinsyaq* was 3018, and after performing *istinsyaq* five times daily for 14 days, the total NOSE score was decreased to 2118; and Table 2 showed that after doing *instinsyaq* five times daily for 28 days, the total NOSE score decreased further to 1416. However, a statistic test was used to prove whether the decrease was significant. To decide the type of test to be performed, first a Shapiro-Wilk data normality test was applied. The data distribution was seen in Table 3 and Table 4.

Table 3. Measurement of data normality test prior to educating istinsyaq and after education on day 14th

First variable	p Value	distributn	Type of test to be performed
NOSE score prior to educating *istinsyaq*	0.119	Normal	Wilcoxon test
NOSE score after day 14th	0.008	Not normal	

Table 4. Measurement of data normality test prior to educating istinsyaq and after education on day 28th

Second Variable	p Value	Type of distribution	Type of test
NOSE score prior to educating istinsyaq	0.119	Normal	Wilcoxon test
NOSE score after day 28th	0.000	Not normal	

Table 3 showed data of total NOSE score prior to to educating the *istinsyaq* ritual had a p value >0.05 meaning a normal distribution. Data of total NOSE score on day 14th had a p value <0.05 meaning data was not normally distributed, therefore the Wilcoxon was applied.

Table 4 showed data of total NOSE score prior to to educating the *istinsyaq* treatment had a p value >0.05 meaning a normal distribution. Data of total NOSE score on day 28th had a p value <0.05 meaning data was not normally distributed. Therefore, the test used was Wilcoxon due to not normally distributed data.

The Wilcoxon test was used on evaluating the total NOSE score prior to educating of ritual, and on day 14th and day 28 after *instisyaq* education. The p value before education and on day 14th was 0.019 (<0.05), which meant there was a significant difference. The p value before education and on day 28th was 0.002 (<0.05), which also meant there was a significant difference.

DISCUSSION

This study aims to ascertain the effect of performing *istinsyaq* in *wudhu* ritual on the degree of nasal obstruction in patients with AR.

SFAR questionnaire was utilized to identify students with AR. In fact, the gold standard for AR diagnose is Skin Prick Test (SPT), but SPT was costly. SFAR is a validated screening tool with score from zero to sixteen to diagnose AR. Subject with cumulative score seven or higher, is categorized as AR sufferer. SFAR could be used as SPT substitute in AR diagnosis. A former study showed a positive significant correlation between SPT and SFAR with p value (0.035) <0.05. Comparing SFAR sensitivity in detecting AR was 80%, which meant that SFAR questionnaire had 80% validity to diagnose AR. While SFAR specificity in comparison with SPT was 83.3% which meant specifically if the total score of SFAR was <7, then the subject was considered did not suffer AR.[13,19-21]

This was the sole reason to do AR screening in the study using SFAR questionnaire. The screening was carried out on the population of class X and XI students at Imam Syafi'i IT High School in Batam City for the 2020-2021 academic year, totaled 179 students, and obtained 33 students who suffered AR with total SFAR score ≥7. Thus, the AR prevalence of class X and XI students at Imam Syafi'i IT High School in Batam City for the 2020-2021 academic year was 18.4%.

In research carried out by students of Faculty of Medicine University of North Sumatra in 2016 using SFAR questionnaire, they obtained an AR prevalence of 114 students out of 279 (40.9%), while the AR prevalence in Indonesia was 1.5-12.4% and increasing every year. The AR prevalence in Asian continent was 5-45%.[6,11,12]

AR reaches its peak in 20 to 40 years of age, and gradually decreases. AR incidence is quite high in pediatry, that it becomes one of the most general chronic pediatric ailments. A study in young children showed a higher AR risk in children with heavy exposure to cigarette smoking in their first year of life. According to data from the International Study of Asthma and Allergies in Childhood (ISAAC), the global average prevalence of rhinoconjuctivitis related to AR in age group 13-14 years is 14.6%, and the global average prevalence of rhinoconjuctivitis related to AR in age group 6-7 years is 8.5%.[7]

In our study, from 33 subjects with AR, the male gender was 17 (51.5%), just a bit higher than female as many as 16 subjects (48.5%). A different result from research by Pinart et al.[22] in 2017 reported that AR in male children aged 11-18 years was significantly lower than in female children. Our research used samples of High School students aged 15-18 years old.

Pinart et al. [22] also stated that there was no specific gender AR prevalence in observed adults. Studies on AR prevalence according to gender is still limited.

NOSE questionnaire had been validated and realiability tested in Indonesian language.[23] A literature review using NOSE questionnaire by Rhee et al.[24] from the United States concluded that surgeries as functional rhinoplasty, septoplasty, nasal valve stenosis repair, et cetera, could influence the NOSE score prior and after surgery with average value 65 ± 22 decreased to 23 ± 20.

A study by Indonesian researchers Lubis[12] in 2017, the same topic with different variables, got the screening result that 114 students out of 279 students of the Faculty of Medicine University of North Sumatra, suffered AR, using SFAR screening translated from English to Indonesian language.

A study by Naibaho in 2017 from the Faculty of Medicine University of North Sumatra showed a significant correlation between SPT positive and SFAR positive with p *value* (0.035) < 0.05.[12,13,25]

In our study, from 33 subjects with AR, 24 of the sufferers had filled completely the questionnaire as many as 3 times, and submitting their daily report of *istinsyaq* five times a day in 28 days.

NOSE score evaluation was performed to 24 subjects prior to educating *istinsyaq*. Afterwards, they were asked to fill NOSE questionnaire on day 14th and 28th after *istinsyaq* practice. The researchers obtained the average NOSE score questionnaire of pretest and posttest. The average total NOSE score prior to educating *istinsyaq* was 30±18, and after *istinsyaq* practice on day 14th decreased to 21±18, and in day 28th the value decreased more to 14±16.

Based on the above analysis result and statistic test, there was a significant decrease on the average total score of NOSE questionnaire subjects with AR, prior to educating and day 14th after practicing *istinsyaq* with *p value* (0.019) <0.05. Also, there was a significant decrease on the average total score of NOSE questionnaire subject with AR, prior to educating and day 28th after practicing *istinsyaq* with *p value* (0.002) <0.05. This finding meant that H0 (null hypothesis) was rejected and Ha (alternative hypothesis) was accepted, that there was an effect of performing *istinsyaq* in *wudhu* on the degree of nasal obstruction in AR patients.

It was surmised that *istinsyaq* practice performed 5 times daily continuously, could decrease the score of nasal congestion of AR patients. This was caused by *istinsyaq* technique which is similar with nasal irrigation using NaCl 0.9% solution, could diminish the symptoms by reducing allergens which were the trigger of AR symptoms. Nevertheless, allergens avoidance should be a requisite for AR sufferers. The European Academy of Allergy and Clinical Immunology (EAACI) had stated that the most safe and effective AR therapy is by avoiding allergen as the trigger.[4]

The result of a study by Ramli et al.[17] on male pilgrimage from Malaysia showed that nasal irrigation known as *istinsyaq* was significantly decrease the symptoms of coughing, rhinorrhea, and nasal congestion. In that particular study AR screening was not performed, thus *istinsyaq* could also decrease nasal congestion on people without AR. *Istinsyaq* and *istintsar* treatment could be used to cleanse mucus and debris inside nasal cavity and respiratory tract. This could be proven through medical analysis by observing the nasal anatomy, physiology and respiratory tract towards nasal base. In modern medical terms, *istinsyaq* is considered a procedure to cleanse nasal cavity due to its similarity with nasal irrigation.[26]

In the study of nasal irrigation using NaCl 0.9% on smoker subjects, in 14 days there was a decrease of nasal congestion level,[27] and in another study, there was an effect of nasal

irrigation using NaCl 0.9% towards time enhancement of nasal mucociliar transport of AR during 14 days. Along with time enhancement of nasal mucociliar transport, alien particles captured on mucus blanket are cleansed towards nasopharynx.[12]

Nasal mucociliar transport could be deterioted as the result of chronic inflammation in AR, allergen cleansing from nasal cavity was diminished and allergen contact was increasing.[28] From electron microscope examination, there was no mucociliar transport difference based on gender. A significant slower mucociliar transport was found on people above forty years of age. It was discovered that microtubules damage and crumpling occurred with ageing process.[3,29–31]

There are five kinds of solution for nasal rinsing, which are: 1) simple pure water, 2) hypotonic saline 0.3%, 3) isotonic saline 0.9%, 4) hypertonic saline 3%, and 5) chlorine (natrium hypochlorite/NaOCl 0.05%) in saline isotonic 0.9%.

In saline hypotonic 0.3% the damage of mucosal cells was minimal, but cells edema and ciliar branch impairment was clearly seen. In saline isotonic 0.9%, intact cilias covered half of epithelium surface, which meant there were no damaged cells. In saline hypertonic 3%, several pores could be seen through detached mucosal cells and the total number of ciliated cells was decreased. Thus, saline isotonic 0.9% is the most physiologic solution for nasal irrigation.[32] Chlorine (NaOCl) is a famous bleaching agent and proven to be an effective disinfectant against microorganisms such as *S. aureus* dan *P. aeruginosa*. Nasal irrigation with NaOCl 0.05% solution in saline could be well tolerated and suitable for human, therefore, could be a good alternative for nasal irrigation in rhinosinusitis therapy with chronic recurrent *S. aureus* infection.[33]

The most commonly utilized is saline isotonic 0.9%, acid in nature with varied pH between 4.5-7. The temperature and optimum pH is still unknown. No solid evidence supporting the use of nasal irrigation with warm saline solution in chronic rhinosinusitis patient care. Hence, warming saline is not necessary, besides there is no additional benefit. Saline solution with higher concentration above 3% is not advisable.[16,34,35] No significant difference was found between isotonic saline 0.9% and saline hypertonic 3% effect in nasal congestion. The time enhancement of mucociliar transport was better in saline hypertonic 3%, but coughing symptoms, nose patency, and nasal secretion were found to be better in saline isotonic 0.9%. Saline hypertonic 3% is more possible to cause irritation and pain compared to saline isotonik 0.9%. Morphologic analysis revealed that pure simple water is unfavourable to normal human nasal epithel cells, and only isotonic saline 0.9% which does not have impact on the morphology.[27,32]

Basal cells in human nasal mucosa could replace the damaged and dead ciliated epithelial cells, and also the goblet cells. Epithelial cells of respiratory tract could regenerate every 28 days, it needs 2-4 days to form the thin epithelial base, and it needs 28 days to fully regenerated.[3,29] Should saline solution is not available for nasal irrigation, it is not necessary to replace it with simple pure water, because this simple pure water could arise pain whenever it is used as nasal irrigation until the deep throat. In performing *istinsyaq*, it is not necessary to inhale water up to the nasopharynx, this is in accordance with the education given to research subjects. It could be surmised that nasal irrigation with NaCl 0.9% is better compared to *istinsyaq* using pure simple water in decreasing the degree of nasal congestion, as to nasal irrigation with NaCl 0.9% could diminish allergen all the way to the throat. The combination of *istinsyaq* and using NaCl 0.9% as nasal irrigation is very effective in decreasing the degree of nasal congestion.

In conclusion, there was a significant decrease of the NOSE score total average of subjects with AR after given *istinsyaq* education on day 14th. There was also a significant decrease of the NOSE score total average of subjects with AR prior to educating *istinsyaq* and after given *istinsyaq* education on day 28th Thus, there was an effect of *istinsyaq* treatment on the degree of nasal congestion in AR patients. To support judgments on the goodness of *istinsyaq*, authors suggest more study must be done with more samples and from more professional backgrounds.

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