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Correlation of Allergic Rhinitis Patient Questionnaire with Skin Prick Test Results at Saiful Anwar Regional Hospital

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Abstract

Objective: To determine the optimal cut-off value of the Allergic Rhinitis Patient Questionnaire as a diagnostic tool and its correlation with Skin Prick Test (SPT) results; Methods: The data used were medical records at the ENT Polyclinic dr. Saiful Anwar Hospital with cross sectional method then the data was processed with the SPSS application; Results.: Demographic data are dominated by males (56.3%) with an age range of 19-59 years (74.7%). The most common symptom complained was nasal congestion (71.3%). The trigger of symptoms is dominated by dust allergens (77%). The most common classification of Allergic Rhinitis (AR) is moderate – severe (50.6%) with Visual Analogue Scale (VAS) score > 5 and dominated by complaints of sleep disturbances (57.5%). The optimal limit value of the Allergic Rhinitis Patient Questionnaire is 10, where patients with a score value ≥ 10 can be assumed to suspect AR. There is a significant correlation between the results of the assessment using the Allergic Rhinitis Patient Questionnaire and the results of the SPT examination. Conclusion: Patients with a total score of Allergic Rhinitis Patient Questionnaire ≥ 10 were assumed to be suspected of AR and the results of the questionnaire assessment correlated with the SPT results.

Keywords: Allergic Rhinitis; Skin Prick Test; Questionnaire; Allergic Rhinitis Patient Questionnaire.

INTRODUCTION

Allergic rhinitis (AR) results from a chronic type 1 hypersensitivity reaction in the nasal mucosa in response to inhaled allergens mediated by Immunoglobulin E (IgE). AR is not a dangerous disease that can increase morbidity but can cause a decrease in quality of life. Prevalence data presented by The International Study of Asthma and Allergies in Childhood shows that AR occurs in 10-40% of the world's population, which is around 400 million people, where the prevalence of cases is higher in adults, which is 14.93% of cases and in children 8.38% of the total world population.(García et al.,2021) Skin Prick Test (SPT) examination is the gold standard examination in establishing the diagnosis of RA. However, the SPT examination has several limitations such as the limited number of health workers who are experts in its implementation and the availability of tools and materials so that the development of questionnaires as diagnostic tools is increasingly being developed. (Monisha R et al., 2023)

The Allergic Rhinitis Patient Questionnaire is one of the validated RA questionnaires in Indonesian that has been tested for validity and reliability. Research on the Allergic Rhinitis Patient Questionnaire is still minimal and still needs to be developed further in its use as a diagnostic tool so that researchers feel the need to see the correlation of the Allergic Rhinitis Patient Questionnaire with the results of SPT examinations in RA patients. (Yuliantoputri SR et al., 2022)

MATERIALS AND METHODS

This study is a descriptive-analytical study with cross-sectional sampling to see the characteristics of patients diagnosed with Allergic Rhinitis with positive SPT to inhalant allergen examination results based on the "Allergic Rhinitis Patient Questionnaire" questionnaire in the period January - June 2024 at the ENT Polyclinic, Dr. Saiful Anwar Hospital. The inclusion criteria in this study were patients with suspected RA who underwent examination in the ENT Polyclinic at Dr. Saiful Anwar Hospital from 1st January 2024 until 30th June 2024, patients who had general data, SPT examination results and clinical data that were recorded entirely. The exclusion criteria in this study were patients with contraindications for SPT examination such as patients

taking antihistamines, antidepressants or β - Blocker within 7 days before the examination, patients with skin disorders such as dermatographism and patients who are uncooperative during the examination.

All data related to the correlation of SPT examination and the "Allergic Rhinitis Patient Questionnaire" questionnaire will be processed analytically using the Statistical Package for the Social Sciences (SPSS) program. The SPSS method used in determining the optimal limit value of the "Allergic Rhinitis Patient Questionnaire" is the Receiver Operating Characteristic (ROC) curve and the correlation of diagnostic results using the "Allergic Rhinitis Patient Questionnaire" with the results of the SPT examination is tested using the Chi-Square method.

RESULTS AND DISCUSSION

Characteristics of Allergic Rhinitis Patients

Medical record data collection was carried out cross-sectionally on the medical records of patients registered at the ENT Clinic from 1 January 2024 to 30 June 2024. The total number of patients examined during this period was 132 patients, of which 87 patients had positive SPT results for inhalant allergen and 45 patients had negative SPT results for inhalant allergen. All respondents met the research inclusion criteria. Patients' Demographic data in this study will be presented in tabular form (Table 1).

Of the total respondents with positive SPT results, male sufferers are more dominant than female sufferers, with a percentage of 56.3%. There are some controversies regarding the gender that dominates RA in adulthood. The theory that can explain this condition is the absence of a significant difference in gender prevalence in RA sufferers in adulthood (18-79 years). Most respondents with positive SPT results in this study were aged 19-59 (74.7%). The results of this study are based on the "Allergic March" theory, where RA begins to occur in individuals over 17 years of age who previously had a history of allergies such as atopic dermatitis or a history of food allergies during infancy or childhood. (Rosen C et al., 2023)

The characteristics of RA patients in this study are presented in Table 2. In the study subjects, the most common symptom complained of by RA patients was nasal congestion, which was 71.3% of the total study subjects. Other complaints felt by the study subjects were followed by symptoms of a runny nose (64.4%), sneezing (59%), itchy nose (37%) and complaints of red, itchy and watery eyes (23%). This is in accordance with a study conducted by Seung-No Hong et al., in which the most common symptom complained of by RA patients was nasal congestion.6 The allergen that most often triggers allergy symptoms is dusty places (77%), and the allergen that most often triggers symptoms is pollen (3.4%). The results of this study are in accordance with the study conducted by Sheila et al., where house dust is the most common inhalant allergen that causes RA in Indonesia. (Yuliantoputri SR et al., 2022)

More than half of the total number of research samples felt the frequency of symptoms felt more than 4 weeks and occurred consecutively, where as many as 13 people (15%) of the total respondents experienced persistent allergic rhinitis symptoms where symptoms were felt for 4 days a week and more than 4 weeks in a row. As many as 57.5% of sufferers felt their sleep quality was disturbed because of the symptoms felt. This study's results align with research conducted by Jiaomei Liu et al., which looked at the correlation between RA patients and sleep disorders. The results of the study showed a significant correlation between RA patients and sleep disorders.(Liu J et al., 2020) Another study found that sleep disturbances occurred in 1 in 4 respondents due to the allergy symptoms they experienced.(Dykewicz MS et al., 2020) This is certainly correlated with daily activities and the sufferer's participation in daily activities (49.4%) and the sufferer's participation at school or work (42.5%). RA symptoms are felt to be troublesome in more than half of the study sample (56.3%) (Katel P et al., 2021)

The results of this study indicate a disturbance in the quality of life in RA patients. Research conducted by Widuri also provided similar results where there was a decrease in the quality of life in 54.35% of the total research sample.(Widuri A et al., 2020) The VAS score assessment of 52.9% of respondents also gave a figure > 5, where a VAS score assessment > 5 indicates that allergic rhinitis symptoms are not controlled and have disrupted the sufferer's quality of life.

Optimal Limit Value of Allergic Rhinitis Patient Questionnaire

In determining the optimal cutoff value of the Allergic Rhinitis Patient Questionnaire, the researcher used the Receiver Operating Characteristic (ROC) curve method in SPSS. Based on Table 4, the diagnostic value is presented which is the result of the intersection of the variables from the total score of the Allergic Rhinitis Patient Questionnaire where patients with a positive RA category are used as the determination. The ROC curve image shows the location of the intersection determination, by looking at the point of the line closest to the upper left corner, namely sensitivity 1 and 1-specificity of 0. (Nahm FS., 2022)

The optimal threshold value obtained to assess the intersection of the total score of the Allergic Rhinitis Patient Questionnaire is 9.5, where the sensitivity number of the test is 0.690 and the 1- specificity number is 0.178. This illustrates that the score value ≥ 9.5 is included in the positive RA category, and score value < 9.5 is included in the harmful RA category. However, because there is no decimal value in the calculation of the questionnaire score, then according to statistical

science, the optimal limit value taken is 10. The results of the interpretation with an optimal limit value of 10 are respondents with a score value of the Allergic Rhinitis Patient Questionnaire ≥ 10 shows that the respondent can be assumed patient is suffering from RA and vice versa where respondents with a score < 10 can be assumed that the respondent does not suffer from RA. The optimal cutoff value shows a sensitivity of 69.0%, and a specificity of 82.2% (1 – 0.178). The Area Under Curve (AUC) figure on the ROC curve of this study is 0.868. The AUC value in this study is 0.86 where the AUC value above 0.80 indicates that the test results can have very good clinical utility. (Parody S et al., 2022)

Correlation of Allergic Rhinitis Patient Questionnaire with Skin Prick Test Examination

The researcher used a correlation test with the Chi Square method in SPSS to see the relationship between the diagnostic value of the Allergic Rhinitis Patient Questionnaire and the results of the SPT examination. (Table 5.) The hypothesis used in this study is if H0: There is no significant relationship between the variables and if H1: There is a significant relationship between the variables. If the significance value (p-value) in the correlation test ≤ 0.05 then H0 is rejected and if the significance value (p-value) in the correlation test > 0.05 then H0 is accepted.

Of the 87 respondents with positive SPT results, 60 respondents gave a score of ≥ 10 on the Allergic Rhinitis Patient Questionnaire and 27 respondents gave a score of < 10 on the Allergic Rhinitis Patient Questionnaire. Of the 45 respondents with negative SPT results, 37 respondents gave a score of < 10 on the Allergic Rhinitis Patient Questionnaire and 8 other respondents gave a score of > 10 on the Allergic Rhinitis Patient Questionnaire. The data were then analyzed using the Chi Square method and obtained a p-value smaller than α (0.000 < 0.050). The results of this analysis can be interpreted that there is a significant relationship between the diagnostic assessment results using the Allergic Rhinitis Patient Questionnaire and the SPT examination, which is the gold standard examination in establishing a diagnosis of RA. The Positive Predictive Value (PPV) figure in this study was 88.2% (Positive), while the Negative Predictive Value (NPV) figure obtained was 57.8% (Negative). The percentage of category accuracy in this study was 73.5%, indicating that the results of this study are reliable.

Some limitations in this study include the standardization and clinical testing of allergen extracts used in SPT examinations at the ENT Polyclinic at Saiful Anwar Hospital, which are limited because the allergens produced by the Soetomo Pharmacy laboratory which are not freely traded. Another weakness of this study is the limited age range of respondents, as the majority of the study samples were adult patients. This limitation occurs because SPT examinations at Saiful Anwar Hospital, in addition to being carried out at the ENT Allergy Polyclinic, can also be carried out at the Pediatrician, so this study is less able to represent and correlate the results of research on pediatric patients with suspected RA. The third weakness of this study is that this study does not evaluate risk factors that influence the incidence of RA such as anatomical factors and comorbidities. Therefore, further, more comprehensive research is expected to be able to conduct further evaluations.

CONCLUSIONS

The gender that dominates patients with RA in this study is male (56.3%), where the age of the majority of respondents is adult, namely 19-59 years old (74.7%). The most common symptom complained of by RA sufferers is nasal congestion (71.3%), with the allergen that most often triggers symptoms, which is dust (77%). The most common RA classification is moderate-severe symptoms (50.6%) which are dominated by complaints of sleep disorders (57.5%). The VAS score assessment is dominated by a score of > 5. The optimal limit value of the Allergic Rhinitis Patient Questionnaire is 10 where in patients with a score of ≥ 10 can be assumed that the patient is suffering from RA while patients with a questionnaire score <10 can be assumed that the patient does not suffer from RA. There is a significant correlation between the results of diagnostic assessment using the Allergic Rhinitis Patient Questionnaire with the results of the SPT examination which is the gold standard examination in establishing a diagnosis of RA.

Competing Interests: The authors state that there are no competing interests.

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