Quality of life against seasonal vs perennial allergens: ESPRINT-15 modified in the pediatric population

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Abstract

Introduction: Allergic rhinitis (AR) is a clinical syndrome characterized by IgE-mediated inflammation of the nasal mucosa. The present study investigates the quality of life (QoL) with AR among adults, using widely validated questionnaires, unlike in pediatric patients.

Materials and methods: A cross-sectional descriptive observational study was conducted, analyzing the QoL of 102 children with AR aged between 10-15 years, belonging to two health centers (HC) in Zaragoza and two HC in Coruña. The comparison of means between the two groups is carried out using the Student’s t test or the Mann-Whitney test, considering a value of p < 0.05 to be significant.

Results: Around 102 children were studied, with a majority (59.8%) being male and a mean age of 12 years. Around 76.5% have a family history of atopy. It was found that AR is more prevalent in Zaragoza (p < 0.005), and asthma highly prevalent in Coruña (p < 0.001). The most important sensitizations are pollen in Zaragoza (p < 0.05) and dust mites in A Coruña (p < 0.001). More treatment needs and associated comorbidities (p<0.05) were observed in A Coruña. The results of the ESPRINT-15 show that 63% of the patients have a good QoL, 27% fair, and 8.8%, poor. Those sensitized to mites have a worse score (p = 0.02). It was found that 52% of children experienced improvement during home confinement, with no notable differences between the two populations. The use of the mask favored QoL in patients from Zaragoza (p < 0.001).

KEYWORDS
ESPRINT-15, rhinitis, quality of life, childhood allergy, HRQoL, SarsCov-2, prevention

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Introduction

Allergic rhinitis (AR) is defined as an IgE-mediated inflammation of the nasal mucosa after exposure to a given allergen in previously sensitized individuals. The current epidemiological studies show a clear increase in the prevalence of AR in developed countries, affecting nearly 25% of the general population. According to data from the International Study of Asthma and Allergies in Childhood (ISAAC), in Spain, 8.5% of children aged 6-7 years and 16.3% of those aged 13-14 years report having had symptoms of allergic rhinitis during the last year. The predominant allergens are dust mites (in warm and humid coastal areas) and pollens (more important in inland areas), with grasses being the main cause of allergic asthma worldwide, including Spain. The pollination period is from March to August. Olive pollination is usually from the month of March to May. The cupresaceae pollinate from January to June, with a peak in February and March, and the salsola pollinate from March to October, with peaks in August and September. Fungi and pets are also common causes of allergy to inhalants among children.

Although the predominant pollination season is spring, the pollen calendar covers the entire year. In addition, there are important geographical differences, both in the prevalence of AR (10.1% in Barcelona compared to 22.2 and 23.3% in Asturias and Madrid, according to data from the ISAAC study for children aged 6-7 years), and in the predominant allergic sensitization profile (seasonal-pollen in the interior of the country and perennial-acarine in coastal regions).

Currently, the classification proposed by the AR and its impact on asthma (ARIA) initiative, validated in Spain for use in pediatric patients is followed. The diagnosis is fundamentally clinical based on a correct anamnesis, and it is necessary to carry out an allergy study. The treatment is based on identifying and eliminating specific allergens and the use of medication to control symptoms.

In recent years, AR has gained considerable relevance as a global health problem. It negatively influences the school performance and work productivity, since it decreases attention and concentration, and affects the social life of patients. It constitutes a very important risk factor for the subsequent development of asthma and other comorbidities. The measurement of health-related quality of life (HRQoL) is one of the most innovative aspects of the evaluation of AR in recent years, occupying an important role in the objectives for the control of the disease.

Although there are numerous questionnaires to assess QoL, most have been developed in Anglo-Saxon countries. Thus, one of the main limitations is adaptation to other cultures, like Paediatric Rhinoconjunctivitis Quality of Life Questionnaire (PRQLQ), since cultural background and semantics are very important for validation. There is only one questionnaire that is designed and developed entirely in Spain: the ESPRINT questionnaire (Spanish study of quality of life in patients with rhinoconjunctivitis). It is the most widely used one in the Spanish population due to the fact that it is well-adapted to the culture of the country. The ESPRINT comes in two validated versions, a 28-item long version for research, and a shorter 15-item version (ESPRINT-15) to be used in clinical practice. The suitability of the ESPRINT-15 questionnaire as an instrument for measuring HRQoL in Spanish adults with allergic rhinitis has been verified. However, there is no validated questionnaire for the Spanish child population. So, we have adapted the ESPRINT-15 for better compression and applicability in children, as shown in Figure 1. The repercussion in the daily life of patients with AR is often neglected from an exclusively clinical analysis. Here, the QoL questionnaires are constituted as an indispensable instrument to evaluate the true scope of it.

Therefore, the main objective of the study was to understand whether the quality of life (QoL) of pediatric patients with AR in our environment was affected. The secondary objectives were to determine whether there were differences in QoL depending on geographical location and the type of allergen involved, and to assess whether prevention measures against the COVID-19 pandemic influence the quality of life of pediatric patients with AR.

Materials and Methods

A cross-sectional descriptive observational study is carried out whose main objective is to evaluate the QoL of children with AR belonging to several health centers (HC) (2 in A Coruña and 2 in Zaragoza) with exposure to different types of aeroallergens.

All patients of the study had to be diagnosed with AR, should be between 10-15 years of age, and must have signed the informed consent after being explained the information sheet. Those patients who presented some concomitant chronic pathology not associated with AR, with an impact on morbidity and mortality that affected the patient’s QoL, as well as any pathology or degree of immaturity that prevented the correct understanding and/or answering of the questionnaire, were excluded. The parents of the included patients duly completed the informed consent form prior to the completion of the questionnaire.

The data collection was carried out on patients who came to the consultation consecutively until the necessary sample was covered, which began once permission was obtained from the Ethics and Research Committee of the
ESPRINT-15 modificado para la población infantil

Durante las últimas 2 semanas, ¿cuánto te han molesto los siguientes síntomas?

<table>
<thead>
<tr>
<th>SÍNTOMAS</th>
<th>Nada</th>
<th>Casi nada</th>
<th>Muy poco</th>
<th>Poco</th>
<th>Bastante</th>
<th>Mucho</th>
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<tbody>
<tr>
<td>1. Sensación de nariz taponada.</td>
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<td>2. Moco líquido “agüilla”</td>
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<td>3. Picor en la nariz o estornudos.</td>
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<tr>
<td>4. Picor de ojos, necesidad de rascarlos.</td>
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<td>5. Sensación de no poder respirar, ahogo.</td>
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ACTIVIDADES DEL DÍA A DÍA

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<th>SÍNTOMAS</th>
<th>Nada</th>
<th>Casi nada</th>
<th>Muy poco</th>
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<tbody>
<tr>
<td>6. Molestias en el colegio, no poder concentrarse, ni trabajar por la rinitis.</td>
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<td>7. Molestias al jugar/hacer deporte fuera de casa.</td>
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<tr>
<td>8. Molestias que interrumpen lo que haces continuamente.</td>
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SUEÑO

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<th>SÍNTOMAS</th>
<th>Nada</th>
<th>Casi nada</th>
<th>Muy poco</th>
<th>Poco</th>
<th>Bastante</th>
<th>Mucho</th>
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<tbody>
<tr>
<td>9. Me cuesta quedarme dormido por culpa de la rinitis.</td>
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<td>10. Me despierto por culpa de la rinitis (sequedad de boca).</td>
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<td>11. Descanso/duermo mal por culpa de la rinitis.</td>
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PSICOLOGÍA

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<th>Bastante</th>
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<tr>
<td>12. Estoy todo el rato pendiente de la rinitis.</td>
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<td>13. Me irrito más por culpa de la rinitis.</td>
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<td>14. Lo paso mal por culpa de la rinitis.</td>
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EN GENERAL

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<tr>
<th>SÍNTOMAS</th>
<th>Mala</th>
<th>Regular</th>
<th>Buena</th>
<th>Muy buena</th>
<th>Excelente</th>
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<tr>
<td>15. Teniendo en cuenta la rinitis, ¿cómo es su salud?</td>
<td>🌿</td>
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Pandemia COVID19

16. Con respecto a tu rinitis alérgica, ¿cómo te encontraste durante el período de confinamiento domiciliario debido a la pandemia producida por la COVID con respecto a otros años?

Mejor ☀️ | Iguales ☑️ | Peor ☞

17. En comparación con otros años, el uso de la mascarilla como medida de prevención de infección de coronavirus, ha hecho que mi rinitis alérgica:

Mejore ☀️ | Sea igual ☑️ | Empeore ☞

18. Con respecto a tu rinitis alérgica, ¿cómo te encontraste durante el período de confinamiento domiciliario debido a la pandemia producida por la COVID con respecto a otros años?

Mejor ☀️ | Iguales ☑️ | Peor ☞

19. En comparación con otros años, el uso de la mascarilla como medida de prevención de infección de coronavirus, ha hecho que mi rinitis alérgica:

Mejore ☀️ | Sea igual ☑️ | Empeore ☞

Figure 1   ESPRINT-15 modified in the pediatric population.
Results

The sample is made up of 102 patients, with the same number of patients each in Coruña and Zaragoza, i.e., 51 patients. There is a predominance of males (59.8%) compared to females (40.2%), with a mean age of 12.1 years (±1.41 years). Around 76.5% of the patients have a family history of atopy of which 35.3% correspond to AR, with higher prevalence in Zaragoza ($p=0.03$); 15.7% have asthma, which is more prevalent in Coruña ($p<0.01$); 14.7% had both the antecedents and 10.8% have other antecedents such as atopic dermatitis (AD) or food allergies. Around 59% of patients have some comorbidity, such as asthma (35%) or AD (26%), being more prevalent in Coruña ($p<0.05$).

In the main pollens, a clear predominance of affection is observed in Zaragoza compared to Coruña ($p<0.05$), unlike what occurs in the case of mites, where it predominates in Coruña ($p<0.001$). With respect to animal epithelia, there are no statistically significant differences between both the populations, as shown in Figure 2.

Around 92.2% of patients receive treatment to control the symptoms, with oral antihistamines being the most used (86.3%), above nasal corticosteroids (59.8%), eye drops (24.5%), inhaled therapy (22.5%), and immunotherapy (14.7%). In Coruña, a greater use of CIN, inhaled therapy,
López-Rodríguez R et al.

confinement measures do not show statistically significant differences between both the populations. According to the ARIA guidelines, AR is classified as intermittent, mild persistent, moderate persistent, and severe persistent. No statistically significant differences have been found between both populations.

Discussion

AR is highly prevalent in our environment, and it is expected to increase in the coming years. Although it is not a serious condition, it is a chronic respiratory disease with great socioeconomic and health impact, causing a real public health problem. It is essential to diagnose it in order to carry out an adequate treatment and provide an optimal QoL. One of the tools we have to optimize the approach to AR are HRQoL questionnaires. However, unlike what happens with the adult population, there is little literature that refers to HRQoL in pediatric patients.

Through the questionnaire, a very rigorous and highly reproducible mathematical analysis was made. This way we can reliably compare how the quality of life of the patients is affected. In other words, the importance of these determinations is that, thanks to them, the patient’s opinion regarding their disease, their fears or concerns, as well as the limitations it provides, are known in a systematic and especially immunotherapy was observed than in Zaragoza (p<0.05), as shown in Figure 3.

Regarding the QoL of the patients assessed through the ESPRINT-15m questionnaire, 63.7% of the patients obtained an assessment of good QoL, 27.5% regular QoL, and 8.8% poor QoL. At a subjective level, these percentages vary, obtaining a perception of good QoL of up to 86.1%, compared to 2% of poor QoL. The mean score obtained was 22.8 ± 19.9 points. The total score of the ESPRINT-15m questionnaire was higher in Coruña (mean of 26.3 points) than in Zaragoza (mean of 19.2 points) with p=0.02, as shown in Figure 4.

Breaking down the ESPRINT questionnaire, the significance level was calculated with the Bonferoni correction; Zaragoza patients had less nasal obstruction (p<0.05), less ocular itching (p<0.05), and less respiratory difficulty (p<0.05) as well as less difficulty falling asleep (p<0.05).

Given the current epidemic situation caused by COVID-19, it was considered appropriate to investigate how the preventive measures adopted influenced the QoL of patients with AR. Around 35.3% of the patients appreciated the improvement in AR-related symptoms with the use of a mask, and up to 52% with home confinement. When evaluating the effect of the mask in patients with AR, it was observed that 52.9% of the patients in Zaragoza perceived a symptomatic improvement; however, in Coruña this percentage drops to 17.6 (p<0.001). In contrast, the confinement measures do not show statistically significant differences between both the populations.

According to the ARIA guidelines, AR is classified as intermittent, mild persistent, moderate persistent, and severe persistent. No statistically significant differences have been found between both populations.

Figure 3  Treatments used by province.
quality of life against seasonal vs perennial allergens

The difference in the use of inhaled therapy and immunotherapy also stands out, being clearly more frequent in those sensitized to mites (p < 0.05) largely due to the higher prevalence of asthma in this sample, as has been cited above.23

Regarding the current epidemiological situation concerning the global health crisis caused by the coronavirus, as it might be expected, the feeling of improvement in QoL with the use of a mask was statistically significantly better in Zaragoza than in Coruña. It is so since there is a greater exposure to outdoor allergens, and masks partially avoid contact of the aeroallergen with the patient. However, the same does not occur with the confinement factor, where a statistically significant higher prevalence of worsening was expected to be found in Coruña, where the sample is more exposed to indoor aeroallergens. No evidence of this fact has been found in the reviewed literature.

One of the possible limitations of this study is the chronology, since a part of the allergens involved in the development of AR, mainly pollens, are subject to their pollination period. Lastly, it would be interesting to have new studies that allow us to assess the true extent of QoL involvement in pediatric patients, and to do so, we should have validated questionnaires such as the SPRINT-15 for the Spanish child population.

**Conclusion**

AR influences QoL in pediatric patients. A greater affection is observed in coastal the populations where mites predominate, than in inland populations where pollens predominate. There is an important family influence when developing RA. It was found that the use of a face mask subjectively improves the symptoms of AR in those patients exposed to outdoor aeroallergens. The clinical worsening

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**Figure 4** Box plot showing the distribution of scores by provinces.
of AR cannot be related to home confinement in patients sensitized to indoor Aeroallergens.

References