Universidade da Beira Interior
Faculdade de Ciências da Saúde

# - Allergic Rhinitis -

## Comparative study of the prevalence, clinical features, sensitisation profiles and risk factors for Allergic Rhinitis between elderly and young adults in Cova da Beira


Ana Catarina de Guimarães Ribeiro

Dissertação para obtenção do grau de Mestre em Medicina

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**Título:** Comparative study of the prevalence, clinical features, sensitisation profiles and risk factors for Allergic Rhinitis between elderly and young adults in Cova da Beira

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*Aos meus pais*

*e ao meu mano*

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## Abstract

**Background:** Allergic Rhinitis (AR) is the most common allergic disease worldwide. Very few studies have analysed whether the prevalence of AR decreases with age. Therefore, the aim of the present study was to compare the prevalence, pattern of aeroallergen sensitisation and risk factors for AR between elderly and young adults.

**Method:** This was a cross-sectional study using a simple random sample. The population consisted of 2 groups of individuals from Beira Interior: one of young adults (aged between 18 and 35 years) and another of elderly individuals (aged 65 years or older). A standardised allergy and rhinitis questionnaire as well as skin prick tests (SPT) were carried out in all volunteers, except for those who answered the questionnaire by telephone. All patients signed a written informed consent and the study was approved by the Regional Health Authority Ethics Committee. Chi-square test, Mann Whitney U test and logistic regression test were used for statistical analysis. A *p* value less than 0.05 was considered statistically significant.

**Results:** Our study sample included 1460 volunteers. To date, 473 volunteers have been analysed (312 elderly (median age = 72 years; 168 females) and 161 young adults (median age = 29 years; 85 females). Both groups were paired regarding gender. The prevalence of AR was significantly lower in elderly (26.7%) than in young adult volunteers (40.6%) (p=0.0194; Chi-square test). For both groups, association between overall positivity of SPT and self-reported symptoms of AR was highly significant (p<0.0001 for elderly; p=0.0069 for young adults). Significant differences were observed in the sensitisation patterns between the two groups with the elderly being mostly sensitised to *Dermatophagoides pteronyssinus* (11.0%), *Parietaria judaica* (10.5%) and *Olive tree* (7.3%) and young adults mostly to *Dermatophagoides pteronyssinus* (25.7%), *Dermatophagoides farinae* (15.8%) and cereal pollen (16.8%). A significant association was found between AR and urban residence in the elderly group (p=0.047; Chi-square).

**Conclusions**: Our data suggest that the prevalence of AR decreases with age and also that there may be differences in the profile of sensitisation to aeroallergens between young and elderly individuals.


## Keywords

Allergic Rhinitis

Atopy

Skin Prick Tests

Elderly


## Resumo

**Contextualização:** A rinite Alérgica (RA) é a doença alérgica mais comum em todo o mundo. Muito poucos estudos têm avaliado se a prevalência da RA diminui com a idade. Assim sendo, o objectivo deste estudo foi comparar a prevalência, o padrão de sensibilização a aeroalergénios e factores de risco da RA entre uma população de idosos e outra de adultos jovens.

**Métodos:** Estudo transversal usando uma amostra aleatória simples. A população do estudo consistiu em 2 grupos de indivíduos da Beira Interior: um de adultos jovens (com idades entre os 18 e 35 anos) e outro de idosos (com 65 anos ou mais). Um questionário estandardizado de alergia (incluindo RA) e testes cutâneos de alergia (TCA) foram aplicados a todos os voluntários, à excepção dos que participaram por telefone. Todos os voluntários assinaram o consentimento informado e o estudo foi aprovado pelo Comité de Ética da Autoridade Regional de Saúde. Para a análise estatística recorreu-se aos seguintes testes: Qui-quadrado, Mann Whitney U e regressão logística. Um valor de $p < 0,05$ foi considerado estatisticamente significativo.

**Resultados:** A população do nosso estudo incluiu 1460 voluntários. Até agora, foram analisados 473 voluntários (312 idosos (idade média = 72 anos; 168 mulheres) e 161 adultos jovens (idade média = 29 anos; 85 mulheres). Ambos os grupos estavam emparelhados quanto à distribuição por sexos. A prevalência de RA foi significativamente menor nos idosos (26,7%) em relação aos adultos jovens (40,6%) ($p=0,0194$; teste do Qui-quadrado). Para ambos os grupos, a associação entre positividade geral dos TCAs e os sintomas de RA foi estatisticamente significativa ($p<0,0001$ para idosos; $p=0,0069$ para adultos jovens). Diferenças significativas foram observadas no perfil de sensibilização entre os 2 grupos, estando os idosos mais sensibilizados a *Dermatophagoides pteronyssinus* (11,0%), *Parietaria judaica* (10,5%) e oliveira (7,3%) e os adultos jovens principalmente a *Dermatophagoides pteronyssinus* (25,7%),

*Dermatophagoides farinae* (15,8%) e pólenes de cereais (16,8%). Uma associação estatisticamente significativa foi encontrada entre RA e residência urbana no grupo dos idosos (p=0,047; teste do Qui-quadrado).

**Conclusão**: Os nossos dados sugerem que a prevalência da RA diminui com a idade e também que parecem existir diferenças entre os perfis de sensibilização de idosos e adultos jovens.

## Palavras Chave

Rinite alérgica

Atopia

Testes cutâneos de alergia

Idosos

## Introduction

Rhinitis is a frequent problem with age (1). It is defined by the presence of one or more of the following symptoms: nasal congestion, rhinorrhea (anterior and posterior), sneezing, and nasal itch. Rhinitis can be classified as allergic or non-allergic (2). In a significant percentage of cases of rhinitis there is an allergic component, defining them as allergic rhinitis (AR). In turn, AR can be classified as perennial or seasonal (also known as “hay fever”), as a consequence of exposure to perennial or seasonal aeroallergens, respectively (2, 3). More recently, AR has been subdivided into intermittent and persistent as well as into mild and moderate/severe (4).

Allergic rhinitis is the leading cause of clinical appointments (55%) in patients treated for the first time in allergy services (5). It is the most common allergic disease and several studies have reported a worldwide increase in its lifetime prevalence, in recent years (6 - 10). In England, an overall 33% increase between 2001 and 2005, not only in the prevalence of AR (7) but also in the prevalence of multiple allergic disorders (8) was suggested by large scale retrospective cohort studies (7, 8). Similarly, a two to threefold increase in lifetime prevalence of seasonal AR in adults was found in Scotland between 1972 and 1996 (9). In East Germany, a study with children also showed an increase in the prevalence of hay fever between 1991 and 1996 from 2.3% to 5.1% (10).

With its increasing prevalence, AR has become a significant health problem as it carries a high burden of symptoms and impact on Health Related Quality Of Life (11 - 14). Although AR has been widely associated with poorer general health and quality of life, leading to impaired social functioning, emotional, and mental health, its symptoms and treatment remain neglected (12, 15 - 16). The most frequent patient reported symptoms are nasal congestion, rhinorrhea, sneezing, itchy eyes and nose, watery eyes and post nasal drip, with a percentage

of the patients reporting coexistence of nasal and ocular symptoms of 83% in one study (11) and 55% in two other (13, 15).

With older age, the immune system is known to undergo some physiological changes, leading to a chronic low-grade inflammatory state associated with a decline of the immune function, a phenomenon named immunosenescence (17). A specific decrease in humoral immune responses, including those related to serum IgE, has been reported in healthy and atopic patients with increasing age (18, 19), which suggests the occurrence of fewer manifestations of allergic diseases in elderly adults than in younger subjects (20). An IgE based study also showed a diminished prevalence of allergic diseases with age (21).

Reports have indeed shown a decrease in the prevalence of AR (22) and diminished reactivity to skin prick tests (SPT) (23) with older age. For example, in France, a study showed that patients with AR were significantly younger than those without such manifestations (12). In Spain, a diminished prevalence of AR with age was found in males older than 35 years (22). In 2005, Ghouri et al, using data from a nationwide health survey in the UK, reported the highest lifetime prevalence rate for males aged 15-19 years and a consistent decrease from this age onwards (7). An 8-year long Danish observational study reported a remission of AR symptoms in the studied adults between 11.8% and 38.2%, depending on the allergens involved, and a 22% decrease in serum IgE levels in the remission cases (24), during the study period.

There is, however, to the best of our knowledge, a lack of published data on directly compared prevalence, patterns of allergic sensitisation and risk factors for AR between elderly and young adults, in the same population, during the same period. Therefore, the aim of our study was to analyse whether the prevalence of AR was lower in the elderly when compared with young adults. Furthermore, we also wanted to know whether the profile of sensitisation to aeroallergens and risk factors for AR were different between these two groups.

# Methods

## 1. Study Design and Sample Selection

This study was carried out at the Faculty of Health Sciences of University of Beira Interior and at Covilhã Primary Health Care Centre.

This was a cross-sectional study using a simple random sample. The population consisted of 2 groups of individuals living in Cova da Beira: one of young adults (aged between 18 and 35 years old) and another of elderly individuals (aged 65 years or older).

Participants were randomly selected using a stratified strategy from individuals who were registered in the lists of 3 General Practitioners (GP) at Covilhã Primary Health Care Centre. Stratification implied selecting the patients according to the two age groups. Based on an estimated prevalence of allergic rhinitis of about 30% for young adults and 15% for elderly adults, previous analysis allowed us to calculate that about 660 elderly individuals and 490 young adults would be necessary for a confidence interval of 95%, and an error margin of 3%. However, based on an expected global response rate of 80%, the calculated number of volunteers would have to be 1438 (825 elderly patients and 613 young adult patients). Overall, our sample eventually consisted of 684 randomized patients from each group, with a total of 1368 patients. An additional 92 patients were also recruited as substitutes for randomized patients that we either could not contact or who refused to participate. Thus, the overall number of assigned patients to our study was 1460.

The study was approved by the Ethics Committee of Sub-Regional Health Administration of Castelo Branco and all patients signed a written informed consent, in accordance with the Declaration of Helsinki.

## 2. Patient Recruitment

Patient recruitment was carried out between June 2008 and December 2009. Participants were contacted by post mail and/or phone. Those who were not currently living in Cova da Beira, who had died and the ones we were unable to contact were excluded from our study. To replace these patients, we followed the epidemiological approach of sequential substitution, involving the selection of the next individual on the original list.

Patients who could not come to the Primary Health Care Centre, either because they refused or due to any other reason, were asked to respond to the questionnaire by phone regarding allergic rhinitis symptoms/previous diagnosis as well as other allergies and treatment for these diseases.

## 3. Questionnaire

Patients filled in a standardised, detailed questionnaire on allergy including demographic and clinical queries, assessment of risk factors, occupational history, environmental exposure, family history of allergy among other (the questionnaire used is included in the Appendix). In case volunteers could not read, they were helped by one of the investigators that would read out the questions and fill in the questionnaire. In all cases, all questionnaires were subsequently checked by one investigator in terms of completion. Questions used as criteria for Allergic Rhinitis were the ones concerning (A) rhinitis in the last year - sneezing, “runny nose” (nasal dripping) or “stuffy nose” (nasal congestion) during the previous 12 months, in the absence of a cold or flu; (B) rhinoconjunctivitis - nasal symptoms accompanied by eye irritation manifested as itchy or watery eyes (C) history of previous diagnosis of allergic rhinitis or hay fever (D) current medication for symptoms of allergic rhinitis. If a patient had at least one positive answer to any of the previous questions he/she

was regarded as having clinical symptoms compatible with rhinitis, in accordance with the Guidelines used for the European Academy of Allergology and Clinical Immunology Study for the ISAAC Study, adapted to an adult population (25).

Patients were further stratified according to their place of residence into urban and rural. "Urban residence" was considered when patients lived in county administrative centres with predominantly industrial or tertiary services whereas the remaining centres were regarded as "rural".

### 4. Skin prick tests

Skin prick tests were performed on the volar aspect of both forearms, using a battery containing 14 single or mixtures of the 35 most prevalent aeroallergens in Portugal, including house dust mites (*Dermatophagoides pteronyssinus, Dermatophagoides farinae),* trees (olive tree, birch), cereal pollen mix, grass pollen mix, weed pollens, *Parietaria judaica*, fungi (*Aspergillus* species, *Cladosporium* species, Mucor, *Alternaria alternata*), cat epithelium and dog epithelium. A negative control containing the diluents used to reconstitute the allergens and a positive control consisting of histamine at 10mg/ml were also applied. Allergen extracts were manufactured by LETI (Barcelona, Spain) and all belonged to the same batch.

The skin was disinfected with alcohol and numbers were written on it to identify the sites where specific allergens were to be applied. A drop of each aeroallergen mixture was placed next to the corresponding number and then pricked through using a 1.5 mm-long plastic sterile sharp point (Stallerkit, Stallergènes, France). Results were read 15 minutes afterwards. If patients were on tricyclic antidepressants or antihistamines or if they had applied any product containing corticosteroids on the skin within the previous 7 days, skin prick tests would be postponed.

A skin test panel was considered valid if the correct outcomes for the controls were verified, including a histamine weal greater than 3 mm in diameter and an absence of weal at the negative control site. Otherwise, tests were considered inconclusive and, if possible, were repeated at least one week afterwards. If the test was valid, a weal diameter of at least 3 mm as a reaction to any of the 14 allergen mixtures was regarded as a positive response.

### 5. Definition of rhinitis and AR

When rhinitic symptoms were reported by volunteers with negative SPTs, they were regarded as rhinitis. If patients had symptoms of rhinitis and atopy was confirmed by positive SPTs, they were regarded as having AR.

### 6. Statistical Analysis

All statistical analyses were performed using SPSS Statistics 17.0 (Statistical Package for the Social Sciences Inc., Chicago, Illinois, USA).

Data obtained were studied based on the relative and absolute frequencies of each studied variable (descriptive statistics). Chi-square tests were used to compare the prevalence of rhinitis and allergic rhinitis between both groups (young adults and elderly adults). Risk factors associated with allergic rhinitis were analyzed by logistic regression analysis. Mann-Whitney U test was used for non-parametric comparison of quantitative data between both groups under study.

A *p* value of less than 0.05 was considered statistically significant.

# Results

## Study population

There were 1460 subjects randomized into this study (684 from each group plus 92 substitutes). Of the 1460 volunteers, we could not contact 810 (55.5%) and out of the 650 we contacted, 145 (9.9%) refused to participate and another 32 (2.2%) had already died. Thus the response rate was 32.4% (Figure 1). The number of replied questionnaires, valid SPTs performed and telephone-based responses are shown in Table 1.

Table 1 Number of completed questionnaires, valid SPTs performed and telephone-based participations.

| | Elderly adults | Young adults | Total |
|---|---|---|---|
| **Questionnaires** | 208 | 105 | 313 |
| **Telephone-based participation** | 104 | 56 | 160 |
| **Total** | 312 | 161 | 473 |

To date, 312 elderly (median age = 72; 168 females) and 161 young adults (median age = 29; 85 females) have been analysed (Table 1).

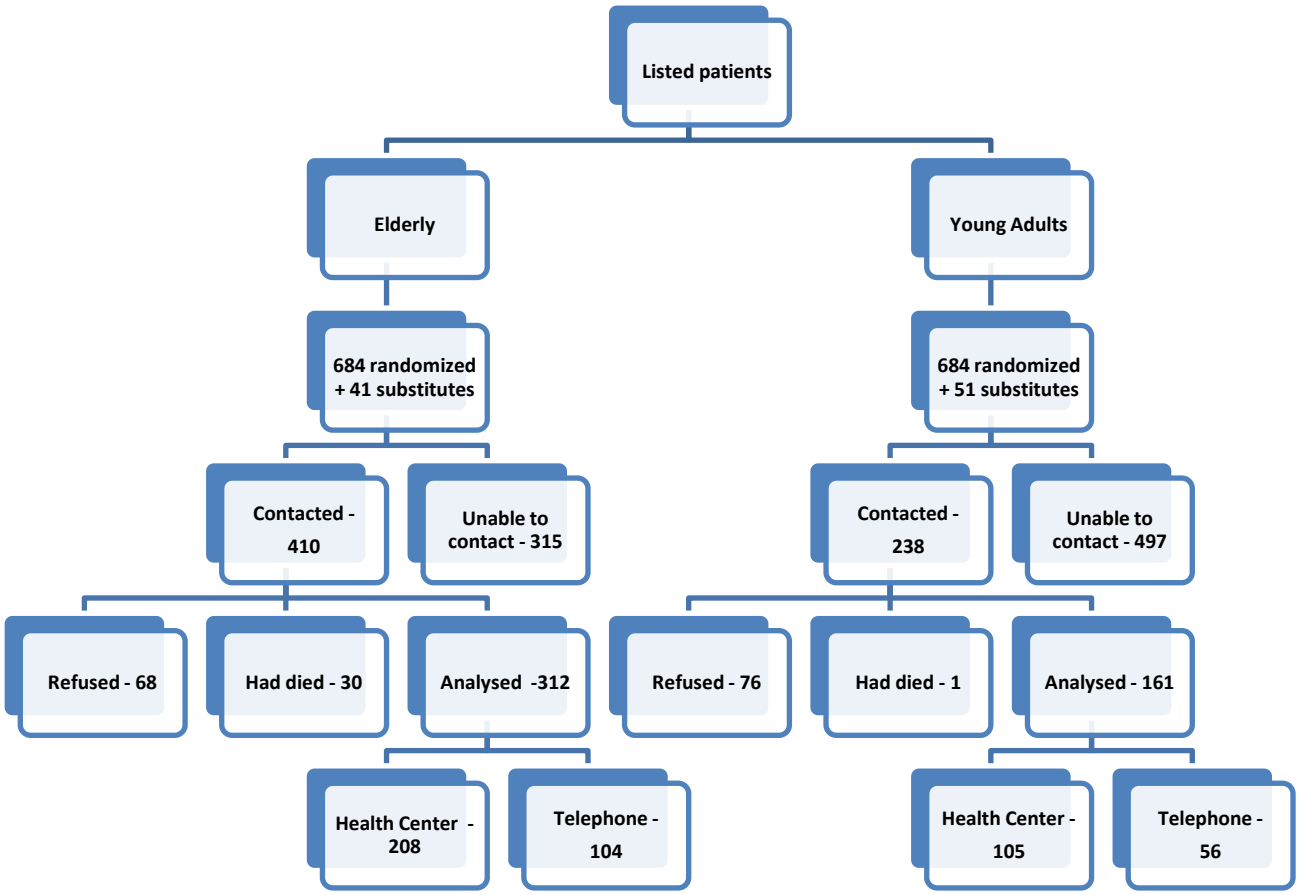


**Figure 1** Flow-chart of the methodology used for patient recruitment

Both groups (elderly and young adults) were paired regarding gender. Data regarding residence, academic degree and jobs of the participants can be found in Table 2.

**Table 2** Demographic characterization of the study population;[ǂ]Jobs were stratified according to the National Reader Survey Scale, United Kingdom (26)

| | Elderly | Young adults | Chi-square test |
|---|---|---|---|
| **Academic degree** | | | |
| **Elementary School** | 129 | 17 | p<0.0001 |
| **High school** | 35 | 48 | p<0.0001 |
| **University degree** | 13 | 38 | p<0.0001 |
| **Jobs[ǂ]** | | | |
| **A** | 16 | 18 | p=0.0175 |
| **B** | 27 | 16 | p=0.7090 |
| **C1** | 23 | 22 | p=0.0297 |
| **C2** | 46 | 10 | p=0.0032 |
| **D** | 63 | 13 | p=0.0002 |
| **E** | 18 | 24 | p=0.0010 |
| **Residence** | | | |
| **Urban** | 167 | 93 | p=0.2268 |
| **Rural** | 35 | 10 | p=0.0557 |

[ǂ]A – upper middle class; B – middle class; C1 - lower middle class; C2 – skilled working class; D – working class; E – those at the lower level of subsistence.

**Comparative prevalence and clinical features of rhinitis**

Prevalence of rhinitis based on self-reported symptoms alone was not significantly different between elderly (44.6%) and young adults (46.6%) (p=0.6739; Chi-square test). Volunteers who filled out the questionnaires had a self-reported prevalence of nasal symptoms of 62.9% for young adults and 59.6% for elderly adults. Patients who responded to questionnaires via telephone had a prevalence of 16.1% of symptoms compatible with rhinitis for young adults and 14.4% for elderly adults. Clinical characteristics of rhinitis in our patients can be found in Tables 3 and 4.

Table 3 Number of positive responses to criteria used to define clinical AR through responses to questionnaires

| | Elderly n (%) | Young Adults n (%) |
|---|---|---|
| **Rhinitis last 12 months** | 119 (57.2) | 66 (62.9) |
| **Rhinoconjuntivitis** | 71 (34.1) | 33 (31.4) |
| **Previous diagnosis of AR** | 21 (10.1) | 9 (8.6) |
| **Current medication for AR** | 24 (11.5) | 3 (2.9) |

No significant differences between groups were detected in terms of expression of conjunctivitis symptoms in association with rhinitis manifestations (p=0.124; Chi-square test). Importantly, significantly more elderly patients than young adult patients were on medication for rhinitis (p=0.017; Chi-square with Yates' correction).

**Comparative prevalence of allergic rhinitis**

Thus far, we have performed 191 valid SPTs in elderly and 101 in young participants. Another 10 tests for the first group and 2 for the latter were considered invalid and SPTs were not performed in 7 elderly participants and 2 young adults. Table 4 shows the clinical characteristics of patients with rhinitis and positive SPTs (who were regarded as having AR).

In both groups, we found that seasonal AR was more prevalent than perennial AR. No significant difference was found between young adults an elderly adults regarding this finding (p=0.642; Chi-square).

Table 4 Clinical characteristics of AR in participants with positive SPTs results

| | Elderly | Young Adults |
|---|---|---|
| **Frequency of symptoms** | | |
| **Perennial** | 12 | 8 |
| **Seasonal** | 39 | 33 |
| **Interference with daily activities** | 1 | 1 |

The overall number of positive SPTs was found to be significantly lower in the elderly group (37.7%) compared to the young adults group (55.4%) (p=0.0036; Chi-square test). Prevalence of AR, as defined by a positive questionnaire associated with positive SPT, was significantly lower in elderly (26.7%) than in young (40.6%) adults (p=0.0194; Chi-square test).

The prevalence of AR when telephone-based responses were considered together with the ones obtained through the intersection of questionnaires and SPTs was also significantly lower in elderly patients than in young adults (22.4% vs 31.1%, respectively; p=0.002; Chi-square test).

**Comparative analysis of allergen sensitisation profiles in young and elderly AR patients**

Since not only the prevalence of AR might be different but also the pattern of sensitisation to aeroallergens, we next analysed the magnitude and profile of individual positive SPTs within each group under study.

The median number of aeroallergens to which participants with symptoms of rhinitis and positive SPTs (patients with AR) were sensitised was 2 (minimum 1 and maximum 9) for the elderly adults and 3 (minimum 1 and maximum 8) for the young adults. No significant differences were found regarding the median number of sensitisations to aeroallergens between both groups (p=0.213; Mann-Whitney U test). In addition, no significant differences were found between the two groups, in terms of polysensitisation, since 41.2% of the elderly participants with AR were polysensitised to 3 or more aeroallergens, whereas 58.5% of the younger group was polysensitised to 3 or more aeroallergens (p=0.098; Chi-square test).

When we compared the median size of weals, as indicators of positive responses to aeroallergens in SPTs, we found that the older group had a significant lower median diameter of the weals to most mixtures used (*Dermatophagoides pteronyssinus, Dermatophagoides farinae,* olive tree, birch, cereal pollen mix, grass pollen mix, weed pollens, cat epithelium and dog epithelium) (p<0.05; Mann-Whitney U test), except for *Parietaria judaica*, *Aspergillus* species, *Cladosporium* species, Mucor and *Alternaria alternata*.

We next compared the profiles of allergen sensitisation between the two groups under study. Significant differences were observed in the sensitisation patterns, with elderly patients being mostly sensitised to *Dermatophagoides pteronyssinus* (11.0%), *Parietaria judaica* (10.5%) and *Olive tree* (7.3%) and young adults mostly to *Dermatophagoides pteronyssinus* (25.7%), *Dermatophagoides farinae* (15.8%) and cereal pollen (16.8%) (p=0.006; Chi-square test with Yates' correction). Table 5 shows a comparison of allergen sensitisation profiles between the two groups.

**Table 5** Patterns of sensitisation to aeroallergens of volunteers with AR criteria

| Allergens | Young Adults | Elderly | Chi- square test |
|---|---|---|---|
| **D. Pteronyssinus** | 26 | 21 | p=0.9818 |
| **D. Farinae** | 16 | 13 | p=0.9726 |
| **Olive Tree** | 13 | 14 | p=0.3648 |
| **Birch Tree** | 7 | 7 | p=0.6568 |
| **Cereal pollen mix** | 17 | 11 | p=0.5004 |
| **Grass pollen mix** | 15 | 10 | p=0.5905 |
| **Weed Pollens** | 12 | 9 | p=0.8577 |
| **Parietaria Judaica** | 9 | 20 | p=0.0014 |
| **Aspergilus** | 2 | 9 | p=0.0232 |
| **Cladosporium** | 2 | 9 | p=0.0232 |
| **Mucor** | 1 | 7 | p=0.0106 |
| **Alternaria Alternata** | 2 | 5 | p=0.1368 |
| **Cat epithelium** | 6 | 3 | p=0.4754 |
| **Dog epithelium** | 7 | 8 | p=0.4552 |

No significant differences were detected in terms of overall sensitisation of patients with AR, in relation to indoor and outdoor allergens, between both groups. In fact, 73.2% of the younger group patients and 68.6% of the elderly patients were sensitised to indoor allergens whereas 63.4% of the young patients and 70.6% of the elderly patients were sensitised to outdoor allergens (p=0.47; Chi-square test).

**Association of rhinitis symptoms with atopy**

For both groups, the association between overall positivity of SPT and self-reported symptoms of AR was highly significant ($p<0.0001$ for elderly; $p=0.0069$ for young adults; Chi-square test).

**Comparative analysis of risk factors for rhinitis in young and elderly AR patients**

We next analysed which risk factors might be associated with the development of allergic rhinitis in young and elderly patients. The risk factors analysed in the present study included family history of AR, family history of atopy, smoking habits of the volunteers, presence of carpets or animals at home, gender, age, residence (urban or rural) and socio-economic class (Table 6).

Table 6 Risk factors for AR in our study population

| | Elderly N(%) | Young Adults N(%) | Chi-square test |
|---|---|---|---|
| **Family history of AR** | 16(8,4) | 16 (15.8) | p=0.0541 |
| **Family history of atopy** | 54(28.4) | 31(30.7) | p=0.6849 |
| **Smoking habits** | 8(4.2) | 37(33.7) | p<0.0001 |
| **Carpets at home** | 38(20) | 12(11.9) | p=0.0805 |
| **Pets at home** | 60(31.6) | 40(39.6) | p=0.1700 |

Bivariate logistic regression analysis for carpets, pets, smoking, family history of AR, family history of atopy, gender, age, residence and social class was performed considering AR

as the dependent factor. A significant association was found between AR and urban residence in elderly participants (p=0.047; Chi-square) (Tables 7 and 8).

**Table 7** Bivariate logistic regression results for risk factors for AR in elderly patients having AR as dependent variable.

| Variables in the Equation | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | B | S.E. | Wald | df | Sig. | Exp(B) |
| Step 1[a] | Carpets | ,090 | ,499 | ,033 | 1 | ,857 | 1,094 |
| | pets | -,446 | ,458 | ,947 | 1 | ,331 | ,640 |
| | smoking | -,200 | ,279 | ,513 | 1 | ,474 | ,819 |
| | family_hx_AR | ,601 | ,626 | ,921 | 1 | ,337 | 1,824 |
| | family_hx_atopy | ,465 | ,482 | ,930 | 1 | ,335 | 1,592 |
| | gender | ,873 | ,460 | 3,604 | 1 | ,058 | 2,395 |
| | age | -,009 | ,033 | ,077 | 1 | ,782 | ,991 |
| | residence | -,880 | ,443 | 3,945 | 1 | **,047** | ,415 |
| | Jobs | ,000 | ,134 | ,000 | 1 | ,997 | ,999 |
| | Constant | -,387 | 2,425 | ,025 | 1 | ,873 | ,679 |
| a. Variable(s) entered on step 1: carpets, pets, smoking, family_hx_AR, family_hx_atopy, gender, age, residence, Jobs. | | | | | | | |

**Table 8** Bivariate regression results for risk factors for AR in young patients having AR as dependent variable

| Variables in the Equation | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | B | S.E. | Wald | df | Sig. | Exp(B) |
| Step 1[a] | Carpets | -,171 | ,765 | ,050 | 1 | ,824 | ,843 |
| | pets | ,696 | ,456 | 2,332 | 1 | ,127 | 2,005 |
| | smoking | ,230 | ,329 | ,490 | 1 | ,484 | 1,259 |
| | family_hx_AR | -,172 | ,281 | ,376 | 1 | ,540 | ,842 |
| | family_hx_atopy | ,495 | ,520 | ,905 | 1 | ,341 | 1,641 |
| | gender | -,193 | ,450 | ,184 | 1 | ,668 | ,824 |
| | age | -,012 | ,056 | ,047 | 1 | ,829 | ,988 |
| | residence | ,434 | ,739 | ,344 | 1 | ,558 | 1,543 |
| | Jobs | -,188 | ,134 | 1,968 | 1 | ,161 | ,829 |
| | Constant | -,371 | 2,111 | ,031 | 1 | ,860 | ,690 |
| a. Variable(s) entered on step 1: carpets, pets, smoking, family_hx_AR, family_hx_atopy, gender, age, residence, Jobs. | | | | | | | |

## Discussion

Our study showed, for the first time in Portugal, that the prevalence of AR was significantly lower in elderly adults when compared to younger adults. Furthermore, our study also showed that elderly and young patients with AR have significant differences in their sensitisation profiles to aeroallergens. Finally, we also showed novel results concerning different risk factors in the two groups under study.

Using a thorough approach that involved a standardised questionnaire, together with skin prick test results, we showed that the prevalence of AR was lower in elderly volunteers than in young adults. This result is concordant with other studies carried out in other countries which have also reported a decrease in the prevalence of AR with age (7, 12, 22 - 23), although their methodological approach was not as thorough as ours. One study that took place in Portugal showed, however, a similar prevalence of AR in all age groups (27), but this study was based on self-reported symptoms alone, which means that such study could not discriminate between AR and other forms of rhinitis. The high prevalence of overall rhinitis that we found, as detected through self reported symptoms in questionnaires when compared to the prevalence of AR as determined by the presence of symptoms in association with positive SPT is interesting. This may be justified by the fact that patients from both groups may overestimate nasal symptoms. In addition, causes other than underlying atopy may underlie a high prevalence of rhinitis-related symptoms. For instance, in the elderly group, the high prevalence of such symptoms may be partially explained by the presence of geriatric rhinitis, a condition that is frequently mistaken for an allergic aetiology and which is due to normal physiologic changes of aging (28). This alerts to the bias in analysis that studies that are only based upon a questionnaire may face and that our study avoided by also including skin prick test results in the definition of allergic rhinitis.

Nevertheless, there may be several explanations for the lower prevalence of allergic rhinitis in elderly patients. Firstly, there may indeed be a true decline in immunological reactivity to antigens, which may not allow the development of allergic sensitisation. A decline in sensitisation to any allergen has been demonstrated in the European Community Respiratory Health Survey (29). In addition, our own study also showed that the magnitude of the weals in positive SPT responses was significantly lower in elderly individuals, thereby confirming a decrease in immunological reactivity to antigens. An alternative explanation is that although patients may be sensitised to aeroallergens, the capacity of non-target organs (such as the skin) to respond to allergen challenge may be more decreased than that of the target organ itself. In fact, in our study, as mentioned beforehand, the SPT-related weals were significantly smaller in elderly patients than in young adults. However, we did not compare nasal sensitivity to aeroallergens between the two groups and, therefore, cannot confirm such possibility. Another possible explanation may be that the profile of allergic sensitisation in elderly patients is substantially different from that of younger patients and therefore a higher proportion of sensitisations to less common aeroallergens may go undetected using the traditional battery of aeroallergens which is directed towards screening allergic sensitisation in younger patients. In our study, even though we used the traditional battery, we were, nevertheless, able to find significant differences in sensitisation to aeroallergens between young and elderly patients. A broader battery might be able to detect further differences. Finally, an alternative explanation may be that elderly patients are more frequently polymedicated than younger patients since the former often have many concurrent illnesses and such polymedication may hamper skin responses to antigens. However, we believe that this is not the case, since tests were always rescheduled when a patient was on an anti-histamine and we did not detect any patient on tricyclic anti-depressants. However, we cannot exclude the possibility that rarer interactions between certain disease states and/or medication may have affected skin reactivity to aeroallergens as detected using SPTs.

Curiously, elderly patients were more frequently under medication for AR than younger volunteers. There are several possible explanations for this finding. Firstly, this may partially be explained by the fact that elderly people tend to seek more medical care. In addition, young adults probably tend to be more neglectful of their symptoms and more careless regarding medication.

As far as interference of AR with daily activities is concerned, participants in our study reported that their AR symptoms did not interfere with their daily standards and habits of living, whereas several studies have shown otherwise, in other populations (11 - 16). The reason for this difference remains to be elucidated, although, in the case of the elderly patients, the fact that most of them were on medication for rhinitis might have decreased their daily symptoms. Furthermore, symptom perception in elderly patients tends to be further blunted than in younger adults. In the case of the latter patients, it is also known that young adults tend to be dismissive of the intensity of their symptoms, which may have biased their responses. Finally, the studies that have shown that AR may interfere with the quality of life of the patients were specifically designed to test such a possibility whereas the question included in our questionnaire may not have been sensitive enough to detect such an effect.

Analysing patients with allergic rhinitis in terms of the pattern of their symptoms (intermittent/persistent and mild/moderate-to-severe) would be quite interesting and important, as recommended by the most recent ARIA guidelines (4). However, we only used the previous classification of perennial/seasonal AR, for two reasons. Firstly, our standardised questionnaire had been developed and validated prior to the release of the new classification and, therefore, its layout would not be able to characterize patients in terms of frequency and intensity of symptoms. Secondly, although desirable, such characterization was not the primary outcome to be analysed in our study. Neverthless, such analysis will be carried out in the near future as a subsequent and additional characterization of the detected patients.

In our study, differences were observed in the sensitisation patterns between the two groups with the elderly being mostly sensitised to *Dermatophagoides pteronyssinus* (11.0%), *Parietaria judaica* (10.5%) and *Olive tree* (7.3%) and young adults mostly to *Dermatophagoides pteronyssinus* (25.7%), *Dermatophagoides farinae* (15.8%) and cereal pollen (16.8%). These differences may be due to discrepancies in environmental exposure patterns to aeroallergens and also to the different amount of time during which each group has been exposed to each allergen. In both groups, the single most prevalent allergen was D. *pteronyssinus* which is also the most commonly reported allergen in the literature (5, 13). In second and third place, elderly participants were sensitised, respectively, to *Parietaria* and Olive tree. A possible explanation may be that *Parietaria* is very common in garden walls at homes. Elderly patients, who are more frequently home-based than young adults, tend to be more exposed to indoor allergens and seasonal allergens that may grow even in urban places such as *Parietaria* or which have a high sensiting capacity, such as olive tree pollens. By contrast, young adults are exposed to a wider variety of environments, which may explain sensitisation by storage mites (*Dermatophagoides farinae*) and also to outdoor allergens such as grass or cereal pollens. An alternative explanation for the differences in sensitisation profiles may be that elderly patients have a cumulative exposure history to allergens that is different from the one associated with younger adults, who were already born in a much more industrialized epoch. This may be ascribed to a possible cohort (time-related) effect of a study involving different groups with different mean ages.

One of the novelties of our study was the assessment of risk factors for AR in the two groups under analysis. In this regard, our study showed that the site of residence (living in an urban environment) may be a risk factor for AR in elderly people but not in young adults. A possible explanation may be that exposure to pollution in urban areas may be responsible for a higher prevalence of allergic diseases (30). Alternatively, current living in a rural environment may protect against subsequent development of this type of diseases as has been

demonstrated in some reports for having lived in a rural environment during childhood (31). In fact, childhood spent on a farm and in other rural environments tends to be more frequent in elderly patients. However, our questionnaire was not designed for specific analysis of sites of residence during childhood. In addition, it should be borne in mind that relatively few patients (either young or elderly) currently lived in rural residences, which may have confounded our results. Alternatively, a cohort (cumulative time-related) effect may also account for the fact that place of residence was only a significant risk factor for AR in elderly but not in young adult patients. Finally, although our study was designed as a case-control study, which is the correct type of study for analysis of risk factors, we have not yet completed analysis of all patients and, therefore, our study may be underpowered, at the moment, to fully detect all relevant risk factors for the development of AR.

Our study had some other limitations. Information bias may be present as answers to background questions depend in part on the memories of the individuals. The sample selection was limited to individuals who were registered as patients of some but not all doctors, thereby conferring a potential selection bias. Another potential selection bias may have been due to the recruitment methodology, since not all volunteers were contacted using the same approach, although the proportion of those that were contacted only by phone was small. It must also be taken into account that the participation was volunteer, which may have skewed the results as patients are more likely to respond if they identify themselves with the subject or problem of the study. Increased awareness of the previously diagnosed patients as well as symptoms of allergy probably explains the higher prevalence of AR and atopy identified among the patients who went to the Primary Health Care Centre for evaluation when compared to those who participated by phone.

Although our questionnaire was thorough in terms of questions focusing on the diagnosis of AR, we did not perform anterior rhinoscopy, which might have confirmed or not the presence of features of rhinitis in our patients and would better allow discrimination

between allergic and non-allergic rhinitis. However, this may not have been a significant problem in our study since we included SPTs in our analysis which may have increased the low discriminative power of questionnaire-based analyses. In addition, we should also bear in mind that anterior rhinoscopy often does not detect nasal mucosal changes in patients with AR who are sensitised to pollen allergens, when these are observed off season, as was the case of many patients in our study.

Also, as mentioned before and also due to the fact that this is a cross sectional study, a possible "cohort-effect" must be taken into account. Though there is a possibility that the observed differences are, indeed, due to the natural history of the disease, they can also be related to different circumstances and lifestyles to which different cohorts are exposed throughout life.

At this stage, our sample is not large enough to allow us to extrapolate the data to the general population. Such assumptions will only be admissible once we have reached the planned numbers of volunteers that will meet those calculated for a correct power for the study.

Although there were some weaknesses in the present study, there were also some strong points. Firstly, this was the first national study and one of the very few internationally speaking that compared demographic, clinical and sensitisation characteristics as well as risk factors for AR between elderly and young adults patients with this disease. In this regard, our study also shows novel data from an international point of view. Secondly, in spite of a potential selection bias, our sample was random and balanced in terms of age and sex. Thirdly, our methodological approach was thorough since it not only involved a validated questionnaire but also skin prick tests for the correct diagnosis of allergic rhinitis.

In summary, our study showed that elderly patients have a lower prevalence of AR, a different sensitisation pattern to aeroallergens, and different risk factors for the disease, when compared with young adult patients.

## Future perspectives

As this is an ongoing study, we are going to continue analysing volunteers in order to meet the required numbers to allow us to extrapolate our data to the general population. Furthermore, IgE will be measured on the collected samples of blood serum of the volunteers and the outcomes will be analysed together with the results from the questionnaires and SPTs in order to improve the specificity of our results. Finally, our patients with positive questionnaires will be further studied in terms of symptom features, as recommended by the ARIA guidelines and they will also be clinically assessed by anterior rhinoscopy so that a firm confirmation of rhinitis will be obtained.

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## Appendix

## Questionário sobre alergias

**Dados Pessoais**

Nome: _____

Morada:_____

Telefone _____

Contacto Preferencial: _____

Contacto Alternativo:_____

✂----------

## Questionário sobre alergias

**Data __ / __ / 2008**

Sexo: Feminino ❑ Masculino ❑

Local de residência:_____

Locais onde viveu anteriormente:_____

Data de Nascimento:

Local de Nascimento:_____

Habilitações Académicas:

Ensino Básico ❑

Ensino Secundário ❑

Ensino Universitário ❑

**1. Questionário Sobre Asma**

- Todas estas perguntas se referem a situações em que não está constipado/a ou com gripe -

1.1 Alguma vez teve pieira ou 'gatinhos no peito'?

Sim ❑ Não ❑

**Se respondeu "Não", por favor passe à pergunta 1.9**

1

1.2 Nos últimos 12 meses, teve "gatinhos" ou "pieira" no peito?

Sim ❑ Não ❑

1.3 Nos últimos 12 meses, quantas vezes teve "gatinhos" ou "pieira" no peito?

Nenhuma ❑
1 - 3 ❑
4 – 12 ❑
Mais de 12 ❑

1.4 Nos últimos 12 meses, os "gatinhos" ou "pieira" no peito foram tão graves que obrigavam a parar de falar para respirar?

Sim ❑ Não ❑

1.5 Que factores agravam os seus "gatinhos" ou pieira?

O tempo ❑
Pólens ❑
Pó da casa ❑
Comidas/Bebidas ❑
Fumo do Tabaco ❑
Outros Fumos ❑
Emoções ❑
Roupa de Lã ❑
Medicamentos ❑
Sabões/Sprays/Detergentes ❑
Constipações/Gripes ❑
Animais de estimação ❑
Trabalho ❑
Exercício Físico ❑
Outros ❑
Quais?_____
_____

1.6 Nos últimos 12 meses, quantas vezes a "pieira" ou a "falta de ar" o/a impediram de fazer as suas actividades diárias?

Nenhuma ❑
1 - 3 ❑
4 – 12 ❑
Mais de 12 ❑

1.7 Os seus sintomas de pieira ou falta de ar surgem:

Durante todo o ano ❑

Só em parte do ano: Inverno ❑

Primavera ❑

Verão ❑

Outono ❑

1.8 Nos últimos 12 meses quantas vezes acordou durante a noite por causa dos "gatinhos" ou pieira?

Nunca ❑

Menos de uma noite por semana ❑

Uma ou mais noites por semana ❑

1.9 Acordou alguma vez com a respiração agitada?

Sim ❑ Não ❑

1.10 Acordou alguma vez com uma opressão no peito?

Sim ❑ Não ❑

1.11 Acordou alguma vez com falta de ar?

Sim ❑ Não ❑

1.12 Nos últimos 12 meses teve tosse seca durante a noite quando não estava constipado/a ou com gripe?

Sim ❑ Não ❑

1.13 Alguma vez teve "pieira" ao respirar durante ou depois de fazer exercício?

Sim ❑ Não ❑

1.14 Nos últimos 12 meses teve "pieira" no peito ao respirar durante ou depois de fazer exercício?

Sim ❑ Não ❑

1.15 Alguma vez teve tosse seca durante ou depois de fazer exercício?

Sim ❑ Não ❑

1.16 Nos últimos 12 meses teve tosse seca durante ou depois de fazer exercício?

Sim ❑ Não ❑

1.17 Alguma vez lhe foi diagnosticada asma por um médico (médico de família ou outro)?

Sim ❑ Não ❑

1.8.1 Se sim, há quanto tempo? _____

1.18 Alguma vez teve necessidade de recorrer a cuidados médicos/Serviço de Urgência por crises de asma?

Sim ❑ Não ❑

1.19 Nos últimos 12 meses quantas vezes teve necessidade de recorrer a cuidados médicos/Serviço de Urgência por crises de asma?

Nenhuma ❑
1 - 3 ❑
4 – 12 ❑
Mais de 12 ❑

1.20 Alguma vez tomou medicamentos para a asma?

Sim ❑ Não ❑

1.21 Toma actualmente medicamentos para a asma?

Sim ❑ Não ❑

1.21.1Se sim, quais? _____

_____

1.22 Anda algum médico a tratar a sua asma de forma regular?

Sim ❑ Não ❑

## 1 Questionário Sobre Tosse e Expectoração

2.1 Alguma vez teve o peito congestionado ou tosse com expectoração?

Sim ❑ Não ❑

2.2 Nos últimos 12 meses teve o peito congestionado ou tosse com expectoração quando estava constipado/a?

Sim ❑ Não ❑

2.3 Nos últimos 12 meses teve o peito congestionado ou tosse com expectoração quando não estava constipado/a?

Sim ❑ Não ❑

2.4 Tem o peito congestionado ou tosse com expectoração a maior parte dos dias (4 ou mais dias por semana) pelo menos durante 3 meses por ano?

Sim ❑ Não ❑

2.5 Há quantos anos tem isto vindo a acontecer? ____anos

## 2 Questionário Sobre Rinite e Conjuntivite

- Todas estas perguntas se referem a situações em que não está constipado/a ou com gripe -

3.1 Alguma vez teve espirros, o nariz "a correr" ou o nariz tapado sem estar constipado ou com gripe?

Sim ❑ Não ❑

Se respondeu não por favor passe à pergunta 3.6

3.2 Nos últimos 12 meses teve espirros, o nariz "a correr" ou o nariz tapado sem estar constipado ou com gripe?

Sim ❑ Não ❑

3.3 Nos últimos 12 meses estes problemas de nariz eram acompanhados de ardor nos olhos e olhos a chorar?

Sim ❑ Não ❑

3.4 Em qual ou quais dos últimos 12 meses é que teve estes problemas no nariz?

| | | | | | |
|---|---|---|---|---|---|
| Janeiro | ❑ | Maio | ❑ | Setembro | ❑ |
| Fevereiro | ❑ | Junho | ❑ | Outubro | ❑ |
| Março | ❑ | Julho | ❑ | Novembro | ❑ |
| Abril | ❑ | Agosto | ❑ | Dezembro | ❑ |

3.5 Nos últimos 12 meses quantas vezes os problemas de nariz o/a impediram de fazer as suas actividade diárias?

Nunca ❑
1 a 3 ❑
4 a 12 ❑
Mais de 12 ❑

3.6 Alguma vez lhe foram diagnosticadas alergias do nariz incluindo febre do feno ou rinite (por um médico de família ou outro)?

Sim ❑ Não ❑

3.6.1 Se sim, há quanto tempo? _____

3.7 Alguma vez tomou medicamentos para estes problemas do nariz e/ou dos olhos?

Sim ❑ Não ❑

3.8 Toma actualmente medicamentos para estes problemas do nariz e/ou dos olhos?

Sim ❑ Não ❑

3.8.1 Se sim, quais?

_____

_____

## 3 Questionário Sobre Eczema

4.1 Alguma vez teve manchas vermelhas na pele, que provocam "comichão", e que aparecem e desaparecem, pelo menos durante 6 meses?

Sim ❑ Não ❑

Se respondeu não por favor passe à pergunta 4.6

4.2 Nos últimos 12 meses teve manchas vermelhas na pele, que provocam "comichão", e que aparecem e desaparecem, pelo menos durante 6 meses?

Sim ❑ Não ❑

4.3 Estas manchas vermelhas que provocam comichão alguma vez lhe apareceram em algum dos seguintes lugares?

Pregas da flexura dos braços ❑
Atrás dos joelhos ❑
Nos tornozelos ❑
Abaixo das nádegas ❑
Ao redor do pescoço, dos olhos e das orelhas ❑

4.4 Alguma vez estas manchas desapareceram completamente?

Sim ❑ Não ❑

4.5 Nos últimos 12 meses quantas vezes teve necessidade de se levantar durante a noite porque essas manchas lhe faziam comichão?

Nunca ❑
Menos de uma noite por semana ❑
Uma ou mais noites por semana ❑

4.6 Alguma vez teve zonas de grande secura na pele que fazem comichão?

Sim ❑ Não ❑

4.7 Nos últimos 12 meses teve zonas de grande secura na pele que fazem comichão?

Sim ❑ Não ❑

4.8 Estas zonas de grande secura na pele que fazem comichão alguma vez lhe apareceram em algum dos seguintes lugares?

Pregas da flexura dos braços ❑
Atrás dos joelhos ❑
Nos tornozelos ❑
Abaixo das nádegas ❑
Ao redor do pescoço, dos olhos e das orelhas ❑

4.9 Alguma vez lhe foi diagnosticado eczema ou dermatite atópica por um médico (médico de família ou outro)?

Sim ❑ Não ❑

Se sim, há quanto tempo? _____

**5. Questionário Sobre Alergias Alimentares**

5.1 Alguma vez teve alergias a algum alimento?

Sim ❑ Não ❑

Se respondeu não por favor passe à pergunta 6.1

5.2 Que tipo de reacção teve?

Alergia na pele ("babas") ❑
Falta de ar no peito ❑
Inchaço nos lábios ❑
Comichão nos lábios ❑
Falta de ar na garganta ❑
Outra reacção ❑ Qual? _____
_____

5.3 Quanto tempo depois de ter ingerido o alimento é que teve a reacção?

Minutos ❑ Horas ❑ Dias ❑

5.4 Que tipos de alimentos lhe causam alergias?

Frutas ❑ Quais? _____
Vegetais ❑ Quais? _____
Peixe ❑ Quais? _____
Carne ❑ Quais? _____
Marisco ❑
Leite ❑
Chocolate ❑
Ovo ❑
Outros ❑ Quais? _____

5.5 Tem algum medicamento para usar de alívio (em SOS), caso tenha nova reacção alérgica a algum alimento?

Sim ❑ Não ❑

**6. Questionário Sobre Alergias a Medicamentos**

6.1 Alguma vez teve alergias a algum medicamento?

Sim ❑ Não ❑

Se respondeu não por favor passe à pergunta 7.1

6.2 Que tipo de reacção teve?

Alergia na pele ("babas") ❑
Falta de ar no peito ❑
Inchaço nos lábios ❑
Comichão nos lábios ❑
Falta de ar na garganta ❑
Outra reacção ❑ Qual? _____
_____

6.3 Quanto tempo depois de ter tomado o medicamento é que teve a reacção?

Minutos ❑ Horas ❑ Dias ❑

6.4 Que medicamento(s) lhe causa(m) alergia(s)?

_____

_____

_____

**7. Questionário Sobre Alergias a Venenos de Insectos**

7.1 Alguma vez teve alguma reacção exagerada à picada de uma abelha ou vespa?

Sim ❑ Não ❑

Se respondeu não por favor passe à pergunta 8.1

7.2 Que tipo de reacção teve?

Inchaço muito grande no local da picada ❑
Falta de ar ❑
Borbulhas ("babas") no corpo ❑
Desmaio ❑
Outra reacção ❑ Qual? _____

_____

7.3 Quanto tempo depois de ter sido picado é que teve a reacção?

Minutos ❑ Horas ❑ Dias ❑

7.5 Tem algum medicamento para usar de alívio (em SOS), caso seja picado de novo por uma abelha ou vespa?

Sim ❑ Não ❑

**8. Questionário Sobre a Profissão e Passatempos**

8.1 Qual é a sua profissão? _____

8.1.1 Neste momento encontra-se:

No activo ❑ Reformado ❑

8.2 Que outras profissões teve e qual a sua duração?

| Profissão | Duração |
|---|---|
| | |
| | |
| | |
| | |
| | |

8.3 Que passatempos tem?_____

_____

_____

_____

## 9. Questionário Sobre a Residência

9.1 Como é a sua residência?

Apartamento em cidade ou vila ❑
Quinta ❑
Moradia em cidade ou vila ❑
Moradia em aldeia ❑
Lar em cidade ou vila ❑
Lar em aldeia ❑

9.2 A sua casa é alcatifada?

Sim ❑ Não ❑

9.3 O seu quarto é alcatifado?

Sim ❑ Não ❑

9.4 Tem animais dentro de casa?

Sim ❑ Não ❑

9.4.1 Se sim, quais?_____

9.5 Tem animais no seu quintal, jardim ou quinta?

Sim ❑ Não ❑

9.5.1 Se sim, quais? _____

**10. Questionário Sobre Hábitos Tabágicos**

10.1 Alguém fuma regularmente dentro de sua casa?
Sim ❑ Não ❑

10.2 Alguém fuma regularmente dentro no seu local de trabalho?
Sim ❑ Não ❑

10.3 É fumador/a?
Sim ❑ Não ❑

10.3.1 Se sim:
10.3.1.1 Quantos cigarros fuma por dia? _____
10.3.1.2 Com que idade começou a fumar?_____

10.4 É Ex-fumador/a?
Sim ❑ Não ❑

10.3.2 Se sim:
10.3.2.1 Idade de início _____
10.3.2.2 Idade de Fim _____
10.3.2.3 Quantos cigarros fumava por dia? _____

**11. Questionário Sobre Medicação**

11.1 Actualmente toma medicamentos?
Sim ❑ Não ❑

11.2 Indique na seguinte tabela os medicamentos que toma e há quanto tempo:

| Medicamento | Duração |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

## 12. Questionário Sobre Antecedentes Familiares de Alergias /Atopia

12.1 Assinale com um X na seguinte tabela as alergias que conheça na sua família:

| **Familiar** | Asma / Bronquite asmática | Rinite alérgica | Eczema | Alergias a alimentos | Alergias a medicamentos |
|---|---|---|---|---|---|
| Pai | | | | | |
| Mãe | | | | | |
| Irmãos | | | | | |
| Avós Paternos | | | | | |
| Avós Maternos | | | | | |

**Chegou ao fim do nosso questionário!**
**Muito obrigada pela sua colaboração ☺**

# *FOLHA DE INFORMAÇÃO DOS VOLUNTÁRIOS*

*(conforme "Declaração de Helsinquia", da Associação Médica Mundial, 1964)*

A alergia é uma reacção exagerada do sistema imunitário ao contacto com proteínas comuns do meio ambiente que, na maior parte das pessoas, não provocam reacção. Pode manifestar-se, entre outras doenças, por asma, rinite, conjuntivite ou dermatite atópica.

Como é importante saber a percentagem de pessoas na região da Beira Interior que têm alergias, levamos a cabo o presente estudo, desenvolvido pela Universidade da Beira Interior, para o qual agradecemos a sua participação.

Para o estudo necessitamos da sua colaboração, através do preenchimento de um questionário, da realização de testes cutâneos de alergia e ainda da colheita de uma pequena quantidade de sangue (20 ml).

Os testes cutâneos de alergia são uma técnica muito segura, frequentemente usada. Consistem na colocação de uma pequena gota de proteínas do ambiente no antebraço. Uma lanceta com uma ponta de 1mm é então usada para introduzir a gota na pele. Caso haja alergia formar-se-á uma pequena pápula associada a alguma comichão, que desaparecem passado pouco tempo.

A colheita de sangue é uma técnica de rotina, sem riscos, que acarreta um desconforto mínimo.

Os testes e a colheita de sangue serão efectuados por médicos com vasta experiência.

Este estudo poderá ajudar esclarecer melhor a frequência e tipo de doenças alérgicas na região da Beira Interior.

Caso assim o deseje, poderá recusar participar neste estudo a qualquer altura, sem que isso prejudique os seus direitos em termos de assistência hospitalar.

Os resultados deste estudo poderão ser consultados pelos responsáveis científicos do projecto de investigação e ser publicados em revistas científicas. No entanto, os dados de carácter pessoal serão mantidos confidenciais.

ESTUDO DA PREVALÊNCIA DE ATOPIA NUMA POPULAÇÃO DE IDOSOS E ADULTOS JOVENS.

Eu, abaixo assinado (nome completo do voluntário)

_____,
compreendi a explicação que me foi fornecida acerca do meu caso clínico e do método ou tratamento que se tenciona instituir, tendo-me sido dada a oportunidade de discutir e fazer as perguntas que julguei necessárias.
Por isso, consinto que me seja aplicado os métodos propostos para o estudo actual.

Data: ____/___/_____
Assinatura: _____

Testemunha (caso haja)
Data: ____/___/_____
Assinatura: _____

Eu, abaixo assinado, _____, investigador responsável, certifico que foram postas à disposição, informações respeitantes ao estudo supracitado, "de modo simples, inteligível e leal", conforme o disposto no Decreto-Lei nº 97/94, de 09 de Abril.

Data: ____/___/_____
Assinatura: _____

# TESTES CUTÂNEOS

## REGISTO DE RESULTADOS

**NOME:**.....

**CÓDIGO:**.....

**DATA:**.....

**Tomou antihistaminicos ou antidepressivos tricicilcos há menos de 7 dias?**.....

**Tem aplicado corticosteróides tópicos na pele?** .....

***BATERIA STANDARD***

1- CONTROLO NEGATIVO..... → _____
2- HISTAMINA..... → _____
3- DERMATOPHAGOIDES PTERONYSSINUS..... → _____
4- DERMATOPHAGOIDES FARINAE..... → _____
5- OLIVEIRA..... → _____
6- BÉTULA..... → _____
7- POLENS III (cereais)..... → _____
8- POLENS IV (gramineas)..... → _____
9- POLENS V (ervas)..... → _____
10- PARIETARIA JUDAICA..... → _____
11- ASPERGILUS..... → _____
12- CLADOSPORIUM..... → _____
13- MUCOR..... → _____
14- ALTERNARIA ALTERNATA..... → _____
15- EPILTÉLIO DE GATO..... → _____
16- EPILTÉLIO DE CÃO..... → _____

**Conclusões**

.....

.....

**Assinatura**

_____