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## OCCUPATION study (OCCUPationl Asthma: a naTIONal based study): A survey on occupational asthma awareness among italian allergists

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### KEY WORDS

*Occupational asthma; occupational rhinitis; diagnostic tools; treatment; medico-legal obligations*

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### Summary

*Occupational asthma (OA) is the most common work-related respiratory disease. Case identification still remains underperformed. The present survey aimed at investigating the awareness about OA among Italian allergists. 538 Italian Allergists completed a web anonymous questionnaire concerning: patient profile, occupational history, disease features, diagnostic work-up, causal agents, management after diagnosis. 80 cases were registered by 14 members (2.4%). Patients were mostly between 30 and 62 years old; noteworthy, 19% were between 18 and 30. All the patients had a concomitant rhinitis, usually preceding asthma onset. Bakers, hairdressers and healthcare workers were more frequently involved. Diagnostic process included: skin prick test (85%), stop/resume test (57%), specific IgE dosage for occupational allergens (52.5%), peak expiratory flow monitoring (32.5%). Noteworthy, only 27.5% of patients underwent specific challenge. After the diagnosis 50% of patients did not change job. One third of the subjects were not referred to the national Workers Compensation Authority. Our data show that OA is quite neglected by Italian allergists, despite they have a pivotal role both in early identification and in primary prevention of OA. Thus, it is worth increasing awareness concerning OA and creating an easy-access network involving allergists and referral centers for Occupational respiratory diseases.*

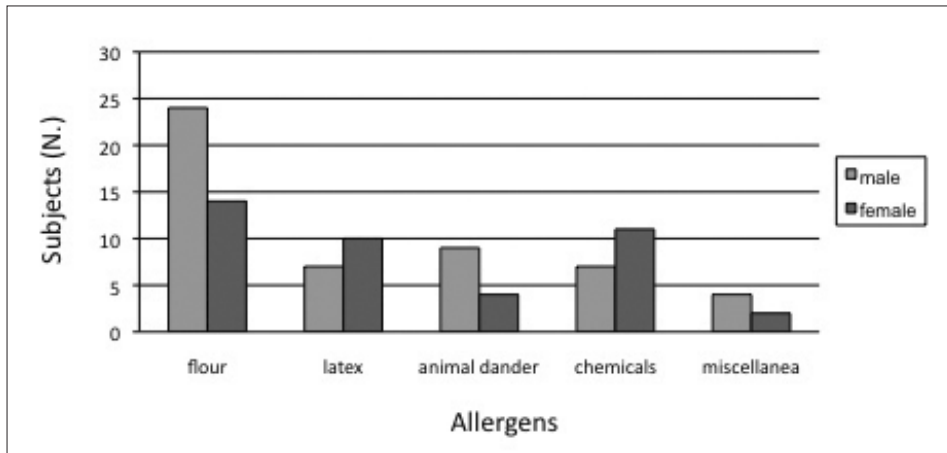
### Introduction

Occupational asthma (OA) is the most common form of work-related lung disease, being about 9-15% of adult-onset asthma due to occupational exposure (1). Although its detection is relevant for medical and socioeconomic consequences, case identification and diagnosis still remains difficult (2). In order to evaluate in a real life setting the awareness of OA among Italian allergists, we performed a web survey concerning some

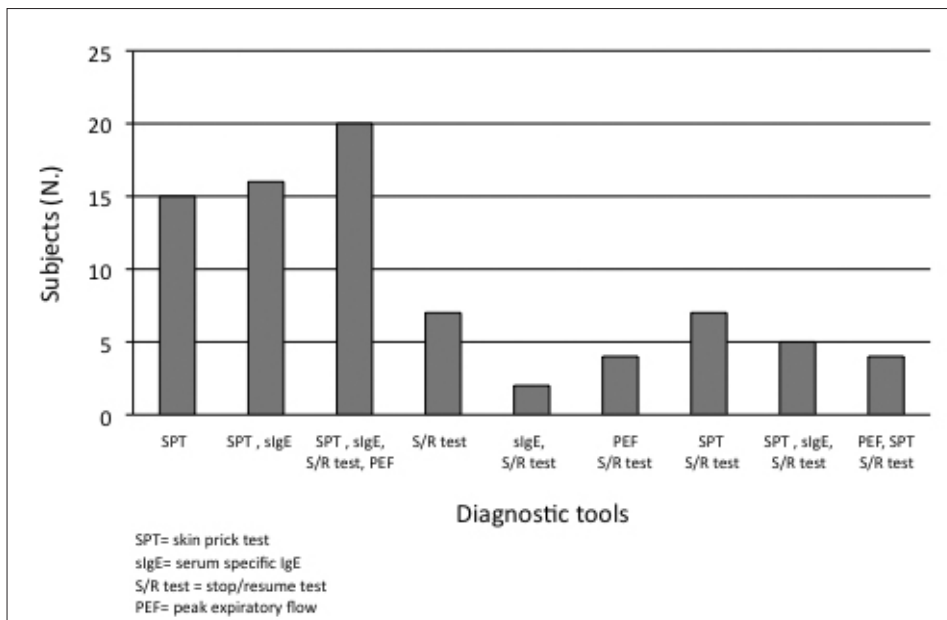
relevant issues in OA, such as responsible agents, diagnostic work-up, treatment options, and medical legal decisions.

### Methods

A web anonymous questionnaire was available on the website of the Association of Italian Allergists ([www.aaito.it](http://www.aaito.it)) for 60 days (from 11<sup>th</sup> April to 11<sup>th</sup> July). An invitation to participate to the survey was sent by e-mail twice to all 583 members of the Asso-



**Figure 1 - Causative allergens and male/female ratio**



**Figure 2 - Diagnostic tools**

ciation, 30 days apart. Participants were asked to include information about all cases of OA observed in their clinic in the last two years. The 16 multiple-choice questions included the following items: patient profile (age, gender), occupational history (work, job duties), disease features (duration of employment at current job before symptoms onset, respiratory and associated symptoms, severity of the disease according to GINA(3) and ARIA(4) guidelines), diagnostic work-up (stop/resume test, skin prick tests, serum specific IgE to occupational allergens measurement, peak expiratory flow monitoring, specific bronchial/nasal/conjunctival challenge), causal agents, management (therapy, medico-legal management), occupational history after diagnosis (change in occupation, change in job but in the same workplace, no change, unemployment), number of followed-up patients, number of new OA cases per year.

**Survey’s results**

*1. Study population*

Overall 80 cases were registered by 14 members (2.4% of all associated), belonging to different centers. Most of the cases (62.5%) were reported by three centers only. In the study population a slight prevalence of males (53.2%) was observed. The age ranged from 18 to 62 (mean: 39.89): 19 subjects were between 18 and 30 years old; 22 subjects were between 31 and 40 years old; 17 subjects were between 41 and 50 years old; 12 subjects were between 51 and 60 years old; 3 subjects were between 61 and 70 years old. No data are available for 7 patients. OA started in 53.3% of cases after more than 5 years of exposure to the occupational allergen, in 25% between 3-5 years and

in 19.7% within less than three years. Patients' jobs were distributed as follows: bakers (37.5%), hairdressers (15%), health care workers (15%), veterinaries (6%), industrial workers (5%), others (21,5%).

## 2. Allergens and clinical findings

Wheat flour was the most recurrent cause (47.2%) of OA, followed by natural rubber latex (23.6%), animal dander (17.8%), persulphates (11.1%) and diisocyanates (8.8%). A different male/female ratio was registered according to different allergens (**figure 1**). The severity of asthma according to GINA Guidelines (3) grading was as follows: mild intermittent in 19.7%, mild persistent in 30.3%, moderate persistent in 43.4% and severe persistent in 6.6%. A concomitant rhinitis was present in all patients, usually preceding the appearance of asthma. Its severity according to ARIA Guidelines (4) was as follows: mild intermittent 6.8%, mild persistent 31.5, moderate/severe intermittent 17% and moderate/severe persistent 38.4%. Various tools were used in the diagnostic process as reported in **figure 2**. Twenty-two patients (27,5%) underwent specific challenge with suspected professional agent. In 45,5% of cases bronchial challenge only was performed; in 9% specific challenge included both nasal and bronchial exposure; in 45,5% bronchial together with nasal and conjunctival challenge was set up. In one patient only nasal challenge was performed.

## 3. Management

Most of patients were treated for both asthma (98%) and rhinitis (87.5%). Nasal steroids were the most frequently used therapy (67%), alone (28.7%) or in combination with anti-histamines (40%). The combination treatment with a long acting beta 2 bronchodilator and an inhaled steroid was the most common therapy for asthma in agreement with a prevalence of moderate-persistent severity. However, comparing the level of severity and the treatment according to the GINA Guidelines (4) an over-treatment seems to be reported in moderate-persistent asthma, whereas an under-treatment was observed in mild and severe persistent asthma.

After the diagnosis of OA 50% of patients did not report any change in the job, 32% changed job in the same workplace, while 14% left work or changed occupation. One third of the subjects were not referred for an occupational disease to the national Workers Compensation Authority (INAIL).

## Discussion

Despite being the most common work-related lung disease (5,6), few cases of OA have been identified by a minority of AAITO associates. It is noteworthy that most of the cases of

OA (62.5%) have been reported by three centers only. Taken together, these data suggest that, excluding few referral national centers, Italian allergists don't seem to be focused on OA in daily practice. It has to be considered that allergists normally visit patients that are referred by GPs. It is therefore possible that GPs refer their patients with suspected occupational respiratory disease directly to specific reference centers (e.g. workplace health regional centers). On the other hand, as much as 25% of adult asthmatic patients are estimated to have work-related asthma (WRA), the possibility that non-occupational physicians, such as allergists or pneumologists, face WRA in daily practice is high (15). Thus, the overall prevalence of occupational asthma in the present survey may be underestimated. Actually, some aspects concerning case identification and diagnostic work-up of occupational respiratory allergy still remain problematic and unclear (7,8), despite recent guidelines (7,9). A detailed occupational and medical history collected by every physician would be helpful for identifying the subjects suspected of having work-related asthma, to address them to in-depth investigations in specialized centers (15). However, lack of standardized diagnostic tools and referral centers may account for weak awareness of allergists about OA. It can lead to a delayed diagnosis that is quite common among these patients (1). The high percentage of moderate and severe occupational asthma detected in this study may be explained by a long duration of symptomatic exposure period before diagnosis. OA affects working-aged population, which is consistent with causative role of occupational agents. Interestingly, in our survey 19% of cases are between 18 and 30 years old. This finding suggests that sensitization may take place during apprenticeship. The increasing prevalence of allergy and asthma in childhood in the last decades accounts for an increased number of young adults entering the workforce affected by respiratory allergy, that is a risk factor for developing sensitization to high molecular weight occupational agents. As pointed out by a recent EAACI position paper, allergists play a pivotal role in preventing occupational respiratory allergy, making their young allergic patients aware of potential work effects on rhinitis and asthma (10). From an epidemiological point of view, our results point out a slight prevalence of males (53.2%) affected by OA, and identify wheat flour as the most recurrent causative agent (47.2%). Our survey does not seem to confirm the epidemiological data in literature of the rising causative role of cleaning substances (11,12). According to our data, a different male/female ratio was registered according to different allergens. Male bakers and female hairdressers seem to have a higher risk of developing occupational respiratory disease. This probably reflects the different male/female ratio in the respective occupations. The model of United Airways Disease has been clearly confirmed in occupational field too (13). In most cases our patients suffering from OA have persistent moderate/severe, ac-

cording to ARIA classification. The severity of both allergic conditions is bothersome for patients. Moreover, these conditions seem to be independent of the type of causative agent involved. Occupational rhinitis should be always assessed and considered as a predictor of subsequent occupational asthma (14). As far as diagnostic work-up is concerned, our survey points out the lack of a homogeneous diagnostic approach. Surprisingly, specific challenge is not the main diagnostic tool, despite the fact that most of the cases of OA (62.5%) have been reported by referral centers for occupational allergy. Skin prick tests were the most frequently used diagnostic tools (85%). Implementation of current diagnostic guidelines in this field is mandatory to improve case identification and diagnostic work-up of occupational respiratory allergy (15). According to our data, most of patients did not change job or activity after the diagnosis of OA, despite the fact that the most common clinical presentation in our survey is moderate to severe asthma. A notification must be submitted to Workers Compensation Authority (INAIL - Istituto Nazionale Assicurazione contro gli Infortuni sul Lavoro) in Italy whenever a worker is diagnosed with OA. Our data show that one third of the subjects after the diagnosis of OA were not referred for an occupational disease to INAIL. This results in lack of compensation claims for the workers and affects INAIL's activity in the field of epidemiology and prevention of OA and rhinitis. It is thus mandatory to promote the knowledge of medico legal obligations among allergists.

In conclusion, it is well recognized that early diagnosis followed by early removal from exposure is the most important factor that determines a favorable prognosis of OA (7,10). Since many/most respiratory allergic diseases are evaluated by allergists as a first line approach, they have a key role in identifying suspected cases (15). Thus, it is worth increasing awareness concerning OA and creating an easy-access network involving allergists and referral centers for occupational respiratory diseases.

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