Prevalence of Allergic Sensitization to Russian thistle in Kingston and the South-eastern Ontario Catchment Area; a Retrospective Chart Review

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Introduction

Allergic rhinitis and allergen-induced asthma often occur concomitantly and are thought to be a part of the same spectrum of disease. Allergen induced asthma and allergic rhinitis are caused by an immunoglobulin E (IgE)-mediated reaction to the protein and glycoprotein components of inhaled aeroallergens such as pollens, moulds and animal dander. The prevalence of allergic rhinitis and allergen induced asthma is increasing. It is believed that up to 40% of adults suffer from allergic rhinitis and 75% of adults with asthma have an allergic component.

Russian Thistle

Name: Russian thistle, *Salsola pestifer* A. Nels.,

Other Names: Saltwort, Tumbleweed, chardon de Russie, herbe roulante de Russie, *Salsosa iberica*

Family: Goosefoot Family (*Chenopodiaceae*)

General Description: Annual, reproducing only by seed. A very bushy, much-branched, spiny plant 5-120cm high. Its diameter often exceeds its height

Habitat: occurs throughout Ontario usually in coarse soils along roadsides, railroads, waste areas and occasionally in pastures and fields on sandy soils

Flowers & Fruit: Flowers from July to August; It is considered an annual weed with seasonal peaks in late summer and early fall

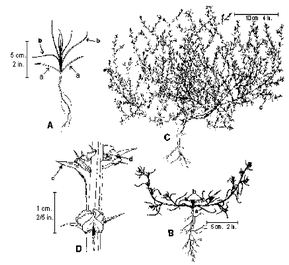

Figure 1: A. Seedling. B. Base of young plant. C. Mature plant. D. Portion of branch with 3 flowers

Russian thistle (*Salsola pestifer* A. Nels.,), commonly known as tumbleweed, has recently been identified as an allergen with a higher than expected prevalence of skin test positivity in an unselected patient population. This previously unrecognized antigen was identified as having positive skin-test responses of over 15% of skin-tested individuals in the third phase of the National Health and Nutrition Examination Surveys conducted throughout the USA between 1988 and 1994.

Methods

A retrospective chart review was conducted at the Queen's University Allergy and Immunology clinic representing patients residing in Kingston and the South-eastern Ontario catchment area. Patients age, gender, skin test reaction and the presence or absence of clinical features were recorded. Relevant clinical symptoms were documented as well as the rate of sensitization amongst tested individuals. Specific clinical parameters on history included nasal congestion, sneezing, rhinorrhoea, pruritis of the nose, eyes, palate for allergic rhinitis and wheezing chest tightness, cough for asthma.

A standardized extract to Russian thistle (ALK-Abello) was used in all tested patients. Only patients with appropriate histamine responses were included in our data. We collected demographic data in addition to the presence/absence of relevant clinical symptoms.

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Background:. Russian thistle has only recently been identified as a potentially clinically important allergen. In the third phase of the National Health and Nutrition Examination Surveys conducted in the USA (1988 -1994) over 15% of tested individuals had positive skin-test responses to this extract. The rate of skin test positivity to Russian thistle in Canada is unknown.

Objective: To determine the prevalence of skin test positivity to Russian Thistle in patients from Kingston and the Southeastern Ontario catchment area, and the possible clinical significance of the same.

Methods: A retrospective chart review was performed to document the rate of sensitization amongst tested patients to Russian thistle extract. Only patients with appropriate histamine responses were included. We collected demographic data in addition to the presence/absence of relevant clinical symptoms.

Results: Of 410 charts reviewed, 170 underwent skin testing to Russian thistle. Of these, 17(10%) were positive. Of the test-positive cohort, 47% (8/17) had symptoms that correlated seasonally with the predominant Russian thistle pollen season (August-October). The mean age of skin-test positive individuals was 35.2 years. 82% and 52.9% of these had concomitant positive skin tests to ragweed and birch, respectively, allergens with known cross-reactivity.

Conclusions: This preliminary evaluation suggests that the prevalence of skin test positivity to Russian thistle in the studied area is approximately 10%, with about half of these individuals reporting correlative seasonal symptoms. Including Russian thistle in routine skin testing panel may better establish the clinical significance of this environmental allergen.

Objective

Given the increasing burden of allergic rhinitis and allergen-induced asthma combined with anecdotal data from the NHANES III trial (suggesting this previously unrecognized allergen to be a potentially significant cause of allergen mediated disease) our primary objective was to determine the prevalence of skin test positivity to Russian thistle in patients from Kingston and the Southeastern Ontario catchment area and to determine the clinical significance of these results.

Figure 2: Russian Thistle

Results

- 410 charts were reviewed in the Queen's University Allergy and Immunology Clinic
- 170 of these patients were skin tested for Russian thistle using a standardized allergen reagent (n=170)
- Of these, 10% (17) were found to have a positive skin test to Russian thistle when compared to an appropriate histamine skin-test response

Results..continued

- Of the skin-test positive cohort, 100% were found to be symptomatic based on history, having clinical features consistent with allergic rhinitis or asthma
- 47% of the skin test positive individuals had symptoms that correlated seasonally with the predominant Russian thistle pollen season (August-October)
- Of positive tested individuals, 47% were male and 52.9% were female
- The median age of skin-test positive individuals was 33 years and mean age was found to be 35.2 years

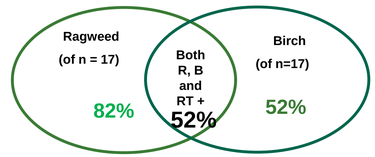

Figure 2: Rates of cross reactivity and overlap

- **Cross reactivity:**
  - Birch, ragweed and kiwi are described antigens with known cross reactivity
  - Of the skin-test positive cohort, 82% had concomitant positive skin tests to ragweed
  - 52% of the skin test positive cohort also had positive tests to birch
  - None of the patients in this series had been skin tested to kiwi

Discussion

- The data suggests that Russian thistle in this particular studied area yields a positive skin test result in 10% of skin tested patients (in an unselected patient population)
- All patients with a positive skin test were clinically symptomatic with symptoms consistent with either allergic rhinitis and/or asthma
- Among these, about half (47%) had symptoms that seasonally correlated with the predominant Russian thistle season between August-October
- There was no significant gender predominance amongst the skin-tested positive cohort
- There may be utility in testing patients with known ragweed and birch allergies to Russian thistle, given the rates of cross-reactivity

Conclusions

- Data obtained suggests that the prevalence of skin test positivity to Russian thistle in the studied area is approximately 10%, with about half of these individuals reporting correlative seasonal symptoms
- Including Russian thistle in routine skin testing panel may better establish the clinical significance of this environmental allergen

This study was approved by the Queen's University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board, with no financial interest or funding provided.