

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 (*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 occurs throughout Ontario usually in coarse soils along roadsides, railroads, waste areas and occasionally in pastures and fields on sandy soils. It is considered an annual weed with seasonal peaks in late summer and early fall.

Russian thistle 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.

Objective

Given the increasing burden of allergic rhinitis and allergen induced asthma combined with anecdotal data from the NHANES III trial, our 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.

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 relevant clinical symptoms (based on history) were documented as well as the rate of sensitization amongst tested individuals. A standardized extract to Russian thistle (Hollister-Steir) 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.

Results

- 410 charts were reviewed, 170 of which were skin tested for Russian thistle using a standardized allergen reagent (n=170)
- Of these, 17 (10%) were found to have a positive skin test to Russian thistle when compared to an appropriate histamine skin-test response
- Of the skin-test positive cohort, 100 % were found to be symptomatic based on history, having clinical features consistent with allergic rhinitis and or asthma
- 47% of the skin test positive individuals had symptoms that correlated seasonally with the predominant Russian thistle pollen season (August-October)



- 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
 - There was no significant results determined involving kiwi, due to lack of standardized testing

Figure 1: Russian Thistle

Results - continued

Discussion

- The data suggests that Russian thistle in this particular studied area yields a positive skin test result in 10% of an unselected patient population
- All patients with a positive skin test were clinically symptomatic with symptoms consistent with either allergic rhinitis and asthma
- Among these, 47% (8/17) 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 47% were male (8/17) and 52.9% (9/17) were female

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.