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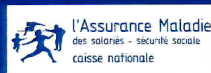
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Short term effects of daily pollen counts on allergic rhinitis and/or conjunctivitis. A pilot study in Clermont-Ferrand, France, 2000-2001



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Background

Allergic rhinitis is a public health concern with a high prevalence (up to 25% in European countries), increasing over the last decades, high economic and social costs, impact on quality of life and a strong association with asthma.

Few data exist considering the dose response relationship between pollen counts and allergic rhinoconjunctivitis in the general population.

Objective

To analyse the short term association between daily pollen counts and daily allergic rhinitis and/or conjunctivitis (ARC) counts in the general population, a pilot study was carried out in the urban area of Clermont-Ferrand (France), using delivered drug prescriptions as the health indicator.

Material and Methods

Study area:

the city of Clermont-Ferrand and 17 towns localised around, at a maximum distance of 13km, i.e. 265 000 inhabitants

Study period:

2000-2001

Health data:

Data source : the regional French Health Care database.

A case of ARC was defined as an individual:

- resident in the urban area of Clermont-Ferrand,
- aged 5 year old or more,
- with a prescription containing antihistamine drugs for systemic use associated with a local treatment for allergic rhinitis, conjunctivitis, or both.

ARC cases were aggregated per day to construct the health indicator.

Exposure data:

Data source: the French Aerobiology Network

Pollens studied:

- 12 allergenic pollens: *Corylus* (Hazel tree), *Cupressaceae* (Cypress), *Alnus* (Alder), *Fraxinus* (Ash), *Betula* (Birch), *Salix* (Willow), *Quercus* (Oak), *Platanus* (Plane-tree), *Poaceae* (Grass), *Plantaginaceae* (Plantain), *Artemisia* (Mugwort), and *Ambrosia* (Ragweed)
- one non allergenic pollen, *Pinus* (Pine)

Daily pollens counts were measured by one measurement station localised in the city of Clermont-Ferrand

Statistical analysis

Daily variations of ARC were correlated with daily pollen counts using Poisson regression models, controlling for temporal trends, air pollution, and weather.

Analyses were performed on the whole population and by age groups (5-14, 15-44, 45-64, and ≥ 65 years old).

Results

Figure 1. Distribution of daily ARC counts (top) and pollen season (back), Clermont-Ferrand, 2000-2001

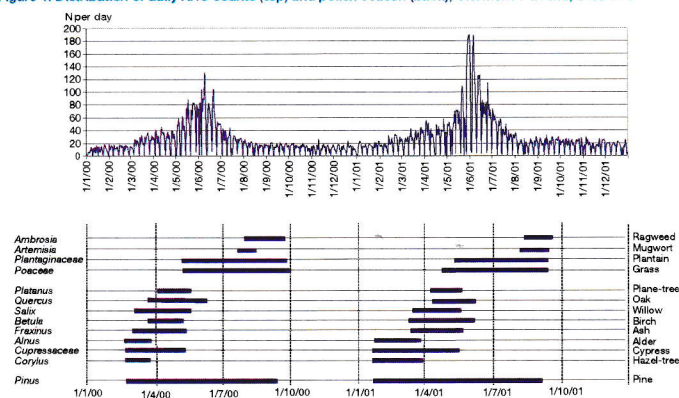


Table 3. RRs of the effect of an increase of interquartile range of daily pollen counts, Clermont-Ferrand, 2000-2001

Pollen	Interquartile range	RR* [95%CI]					
		All ages	5-14	15-44	45-64	≥ 65	
<i>Ambrosia</i>	3	0.92 [0.85-1.01]	0.76 [0.60-0.99]	0.90 [0.78-1.03]	1.10 [0.96-1.26]	0.80 [0.68-0.94]	Ragweed
<i>Artemisia</i>	7	1.02 [0.95-1.09]	1.08 [0.91-1.29]	1.05 [0.94-1.16]	1.08 [0.97-1.21]	0.96 [0.83-1.11]	Mugwort
<i>Plantaginaceae</i>	5	1.01 [0.97-1.05]	1.23 [1.09-1.39]	0.96 [0.89-1.03]	1.07 [0.98-1.16]	1.13 [1.02-1.24]	Plantain
<i>Poaceae</i>	55	1.04 [1.00-1.08]	1.11 [1.04-1.19]	1.05 [0.99-1.11]	1.01 [0.97-1.05]	1.09 [1.04-1.14]	Grass
<i>Platanus</i>	5	1.06 [0.96-1.16]	1.03 [0.93-1.13]	1.04 [0.98-1.11]	1.27 [1.10-1.46]	1.01 [0.93-1.10]	Plane-tree
<i>Quercus</i>	35	1.11 [1.06-1.16]	1.20 [1.02-1.41]	1.31 [1.13-1.53]	1.13 [1.06-1.21]	1.05 [1.01-1.10]	Oak
<i>Salix</i>	4	1.03 [0.99-1.07]	1.07 [0.96-1.19]	1.07 [1.01-1.13]	1.07 [1.01-1.13]	1.05 [0.97-1.14]	Willow
<i>Betula</i>	45	1.22 [1.11-1.35]	1.23 [1.07-1.43]	1.31 [1.19-1.44]	1.16 [1.05-1.28]	1.09 [1.00-1.19]	Birch
<i>Fraxinus</i>	26	1.22 [1.13-1.31]	1.30 [1.07-1.58]	1.40 [1.25-1.56]	1.18 [1.08-1.30]	1.07 [0.94-1.15]	Ash
<i>Alnus</i>	19	0.99 [0.96-1.02]	1.12 [0.96-1.31]	1.004 [0.95-1.06]	1.06 [0.97-1.16]	1.14 [1.02-1.27]	Alder
<i>Cupressaceae</i>	13	1.03 [1.00-1.05]	1.00 [0.96-1.09]	1.03 [1.01-1.05]	1.03 [1.00-1.07]	1.10 [1.02-1.18]	Cypress
<i>Corylus</i>	15	1.00 [0.99-1.06]	1.00 [0.94-1.10]	1.03 [0.97-1.09]	1.005 [0.97-1.04]	1.08 [1.00-1.15]	Hazel-tree
<i>Pinus</i>	13	1.00 [0.99-1.02]	1.00 [0.94-1.05]	1.00 [0.98-1.03]	0.98 [0.95-1.01]	1.02 [0.99-1.06]	Pine

* RR were estimated for an interquartile range increase of pollen counts* and for lag days comprised between 0 and 2 days.
Significant RR are represented in bold style
Pollens for which consistent and significant associations were found are represented in blue and bold.

Table 1. Distribution of daily ARC counts, Clermont-Ferrand, 2000-2001

Age groups (years)	1 st quartile	Mean	Median	3 rd quartile	Maximum
5-14	0	3	1	4	57
15-44	3	12	7	13	123
45-64	3	7	6	10	36
≥ 65	1	4	3	6	20
All	11	26	19	31	189

Table 2. Distribution of daily pollens' counts, Clermont-Ferrand, 2000-2001

Pollen	1 st quartile	Mean	Median	3 rd quartile	Maximum	Pollen
<i>Ambrosia</i>	1	3	2	4	12	Ragweed
<i>Artemisia</i>	2	7	4	9.2	28	Mugwort
<i>Plantaginaceae</i>	2	5	4	7	21	Plantain
<i>Poaceae</i>	4	61	12	59	662	Grass
<i>Platanus</i>	1	5	2	6	31	Plane-tree
<i>Quercus</i>	2	37	8	37	437	Oak
<i>Salix</i>	2	5	3	6	25	Willow
<i>Betula</i>	2	35	12	47	284	Birch
<i>Fraxinus</i>	4	27	12	32	187	Ash
<i>Alnus</i>	2	20	8	21	179	Alder
<i>Cupressaceae</i>	2	16	4	15	277	Cypress
<i>Corylus</i>	2	21	8	17	222	Hazel-tree
<i>Pinus</i>	1	25	3	14	558	Pine

About 50 % of ARC cases occurred between mid-april and mid-july (Figure 1).

Consistent positive and significant associations between daily counts of pollen and ARC were found for *Poaceae*, *Quercus*, *Betula*, *Fraxinus* and *Cupressaceae* (Table 3).

Analyses by age group showed:

- significant associations were found for *Quercus*, *Betula*, *Fraxinus*, in all age groups with the highest RR in the 15-44 age group
- the RR increased with age groups for *Cupressaceae*, with a maximum in the ≥ 65 group
- significant associations were found in the lowest and the highest age groups for *Poaceae*.

Although non significant, positive associations were generally found with the other pollens.

For *Pinus*, no association was found, as expected.

Conclusion

Positive associations with daily counts of ARC were found for most of pollens, though consistent and significant only for *Betula*, *Cupressaceae*, *Quercus*, *Fraxinus*, and *Poaceae*. Results were consistent with clinical observations.

These results need to be confirmed by studies performed on data collected over a longer period of time.

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