



Grass pollen in the atmosphere of Madrid: trends over three decades

Jonathan Kilimajer MD[†], María José Narganes MD[†] Corina Craciunescu[†], Javier Gonzalez^{††}, Javier Subiza, MD[†]

[†] Subiza Asthma and Allergy Centre, Madrid, Spain
^{††} CEO Magna Coaching SL



INTRODUCTION

Pollen from the poaceae family is the most important cause of pollinosis in Madrid. Evidence suggests that the incidence of seasonal allergic rhinitis has increased significantly over the last decades. However long-term trends in pollen concentrations have not been examined in Madrid after the work published by our group in 1995 (JACI 1995;96:15-23.).

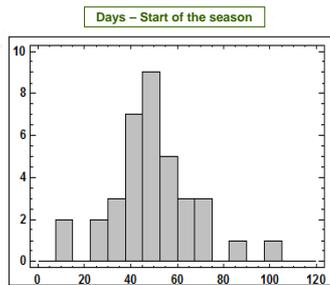
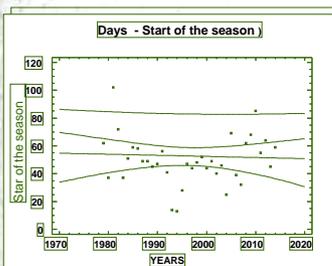
In this review we present concentration data and examine trends of the grass pollen in Madrid over the period from 1979 to 2014 using the record of daily average grass pollen concentrations measured in our center; Clinica Subiza, Madrid, Spain since 1978, one of the longest duration pollen data set in Spain. During this time considerable changes in the land-use patterns have taken place in the region and fluctuations in climate have occurred that may be related to meteorological variations such as the global warming.

METHOD

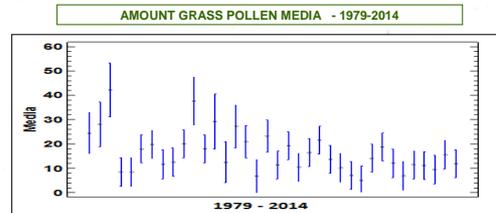
The data of daily average grass pollen concentrations have been taken from our monitoring site in the centre of Madrid with spore traps located on an exposed rooftop measuring pollen data with a volumetric Hirsht spore trap from 1979 to 1982 and with a Burkard 7 day recording volumetric spore trap from 1983 to 2014, following a standard methodology. For the analyses was important to define where the grass pollen season starts and ends because of the variability of lower levels of this pollen at both extremes of the season. We consider the start of the season when the cumulated sum for the daily average concentrations reaches 75 grains/m³.

RESULTS

The trend of the start of the season doesn't change through these years being the media 50 days approximately since the 1st of January of each year.

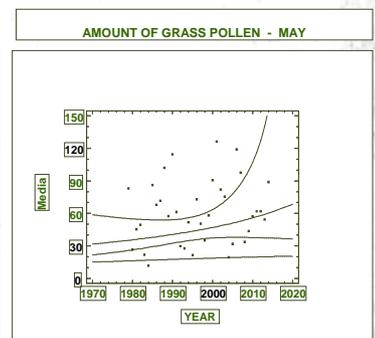
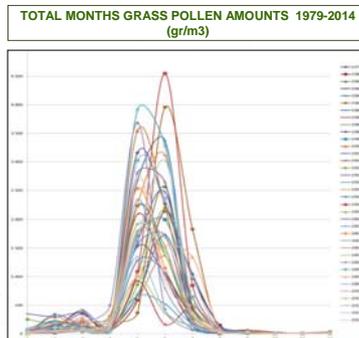


There was a wide year-to-year variations in total atmospheric grass pollen counts, (ranging from 1.863 to 7.885, mean 4.621). A statistical difference between the annual amounts of grass pollen was observed through 1979 to 2014 with a low decreasing trend of the annual media amount ($p < 0.05$).



Peak days, range from 96 grains/m³ of air (May 14, 1992) to 546 grain/m³ of air (May 29, 1988). There were non statistical differences in the amounts of "peak days". The months with more "peak days" was May and June although there were no changes in the trend.

The amounts of May and June were superior to the levels on April and July ($p < 0.05$). Separately by months (April to July) there was no significant differences in the trend but it was a low increase in the amounts of May through the years while it was a low decrease in the amounts of June and July.



CONCLUSION

- 1) The population of Madrid nowadays is exposed to high concentrations of airborne grass pollen like three decades ago. However we observed a low decreasing trend of the annual media amount, maybe as consequence of the urban growth.
- 2) Changes in the pollination intensity in May and June were observed, probably as consequence of the global warming.