Aeroallergen sensitisation and prevalence of asthma, allergic rhinitis and eczema in children with Vernal Keratoconjunctivitis attending Red Cross War Memorial Children’s Hospital

Naidoo, S; Levin ME; Tinley C; Pollock T
Background

• Vernal Keratoconjunctivitis (VKC) is a severe inflammatory disease of the conjunctiva, with complex inflammatory pathways involving IgE and non-IgE mechanisms. (1, 2)

• There is a typical clinical picture w.r.t. age, sex and phenotype which distinguishes VKC from the more common types of IgE mediated allergic conjunctivitis.

• Severe symptoms, difficult to control, corneal damage → visual acuity

VKC

(1) Palpebral

(2) Limbal

(3) Mixed
• Ethnicity has a marked influence on the type of VKC
• VKC and atopy?
• VKC, atopy & ethnicity?

Previous African studies have suggested that there are marked differences in the clinical expression of VKC in Africa, with far less atopy than in European and Asian cohorts. (3, 4)

Europe, South America and Asia: 30% to 51% of VKC patients are atopic

African studies generally <10% VKC patients are atopic (Nigeria 2000, 19.8% physician diagnosed atopic disease) (4)

Aim

Describe the prevalence of allergic sensitisation to common aeroallergens as well as the prevalence of asthma, allergic rhinitis, and eczema in a cohort of children attending Red Cross Children’s Hospital, Cape Town, South Africa
Method

A cross sectional descriptive study where patients under 13 years had

- a diagnosis of VKC confirmed by an ophthalmologist
- completed a questionnaire regarding atopic diseases and symptoms
- a physical examination (general and ophthalmological)
- sensitisation evaluated by skin prick testing (SPT) to common aeroallergens
Results

- n = 214, age: 14 months to 12 years, 10 months
- Gender: M 160 (74.7%), Ethnicity: Black 151 (70.56%)
- Co-morbid atopic disease

<table>
<thead>
<tr>
<th>Condition</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active eczema</td>
<td>17</td>
<td>7.9</td>
</tr>
<tr>
<td>Chronic eczema</td>
<td>27</td>
<td>12.6</td>
</tr>
<tr>
<td>Non specific wheeze</td>
<td>79</td>
<td>36</td>
</tr>
<tr>
<td>Previous asthma diagnosis</td>
<td>38</td>
<td>17</td>
</tr>
</tbody>
</table>
### ISAAC data: Allergic rhinitis

<table>
<thead>
<tr>
<th></th>
<th>1995 (Cape Town)</th>
<th>2002 (Polokwane)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhinitis ever</td>
<td>1944 (37.6)</td>
<td>2466 (49)</td>
</tr>
<tr>
<td>Rhinitis last 12</td>
<td>1569 (30.4)</td>
<td>1939 (38.5)</td>
</tr>
<tr>
<td>months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhinoconjunctivitis</td>
<td>910 (17.6)</td>
<td>1223 (24.3)</td>
</tr>
<tr>
<td>in last 12 months</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ISAAC study Phase II (2003): prevalence of Allergic rhinitis was 38.5%.**


# Allergic rhinitis

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous diagnosis of allergic rhinitis</td>
<td>47</td>
<td>21</td>
</tr>
<tr>
<td>Allergic Rhinitis</td>
<td>122*</td>
<td>57%</td>
</tr>
</tbody>
</table>

*Clinical rhinitis on day of enrolment

**ISAAAC study Phase II (2003)**: prevalence of Allergic rhinitis was 38.5%. (6)
## Results

- Aeroallergen spread (n=213)

<table>
<thead>
<tr>
<th></th>
<th>&gt;3mm wheal</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HDM</td>
<td>123</td>
<td>57.7%</td>
</tr>
<tr>
<td>Grass</td>
<td>74</td>
<td>34.7%</td>
</tr>
<tr>
<td>Cockroach</td>
<td>40</td>
<td>18.77%</td>
</tr>
<tr>
<td>Cat</td>
<td>24</td>
<td>11.26%</td>
</tr>
<tr>
<td>Dog</td>
<td>30</td>
<td>14%</td>
</tr>
<tr>
<td>Tree pollens</td>
<td>17</td>
<td>7.98%</td>
</tr>
<tr>
<td>Mould</td>
<td>8</td>
<td>3.75%</td>
</tr>
</tbody>
</table>

Study Conclusions 1

• Higher incidence of allergic sensitisation and atopic disease in our cohort of 214 children than in previous African studies.
• Our cohort more closely resembles the quoted VKC data from Europe and Asia than the earlier African studies.
• The prevalence of asthma and eczema found in this study is similar to non selected South African subjects.
• The prevalence of allergic rhinitis is striking, much higher than in a non selected SA population.
• The major aeroallergens are HDM, grass and cockroach with some of the highest levels of sensitisation found as yet in an African study.
Study Conclusion 2

- **Service Implications**
- There is currently a well defined management pathway for VKC from primary/secondary to the tertiary Ophthalmology Clinic at Red Cross.
- Children with VKC in Cape Town are atopic and have co-morbid atopic diseases which require care → notably allergic rhinitis.
- **Challenge**: How to access care and maintain treatment for co-morbid atopic diseases within the current structures when chronic paediatric care needs are already underserviced?
Acknowledgements

• ALLSA Research Grant 2013 / School of Child and Adolescent Health (UCT) Research funding

• Sr Heidi Thomas: Study nurse, data capturer

• Eye Clinic: Co-investigators Drs Tinley and Pollock, Sr Y Jacobs and Eye Clinic staff

• Prof ME Levin: Supervisor, HOD of Paediatric Allergy
Further references