Elevated basal tryptase and Hymenoptera venom allergy

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Serum tryptase levels before (A) and after (B) insect sting

Schwartz et al.,
J Clin Immunol 1994
Constitutively raised serum concentrations of mast-cell tryptase and severe anaphylactic reactions to Hymenoptera stings


<table>
<thead>
<tr>
<th>typ of reaction</th>
<th>number of pts.</th>
<th>number (%) with tryptase &gt; 13.5 μg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>A general. skin reaction</td>
<td>38</td>
<td>1 (2.6)</td>
</tr>
<tr>
<td>B intermediate symptoms</td>
<td>39</td>
<td>2 (5.1)</td>
</tr>
<tr>
<td>C life-threatening sympt., incl. unconsciousness</td>
<td>37</td>
<td>9 (24.3)</td>
</tr>
</tbody>
</table>
Elevated basal serum tryptase and Hymenoptera venom allergy

Clin Exp Allergy 2003; 33: 1216-20

- Measurement of the basal serum tryptase (bT) in 259 patients with Hymenoptera venom allergy
  - 158 with bee venom allergy
  - 101 with Vespula venom allergy
- 161 patients with sting challenge during VIT
  - 104 with bee sting
  - 57 with Vespula sting
Results (1)

Basal tryptase and grade of allergic reaction in 259 Hymenoptera venom allergic patients

Grade of allergic reaction:

I  II  III  IV

Tryptase (μg/l):

10  13.5 μg/l  20  30  40  50

grade of allergic reaction
## Results (2)

**Reaction to sting challenge during VIT in relation to basal tryptase:**

<table>
<thead>
<tr>
<th>sting challenge (%)</th>
<th>reaction (n=41)</th>
<th>no reaction (n=120)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>bee</td>
<td>Vespula</td>
</tr>
<tr>
<td>number of patients (%)</td>
<td>34 (32.7)</td>
<td>7 (12.3)</td>
</tr>
<tr>
<td>tryptase &gt; 13.5 μg/l</td>
<td>1 (2.9)</td>
<td>3 (42.9)</td>
</tr>
</tbody>
</table>

VV: $X^2 = 6.926$, $p < 0.01$; BV: $X^2 = 0.001$, ns
VV + BV: $X^2 = 1.187$, ns
Severity of Hymenoptera venom allergy in correlation to bT levels

(IAACI Vienna 2006)

**Background:** Today basal tryptase (bT) concentrations > 11.4 μg/l are considered to be elevated.

**Objective:** To analyze, whether already values between 8 and 11.4 μg/l may indicate an increased risk in patients with Hymenoptera venom allergy.
Severity grade and bT levels

Grade I-III vs grade IV, limit 8 µg/l \( p < 0.01 \)
Grade I-III vs grade IV, limit 11.4 µg/l \( p < 0.05 \)
Therefore

→ Special attention should be given to patients with bT levels between 8 and 11.4 µg/l

→ If an association with more severe reactions is found, a decrease of the upper limit of normal values to 8 µg/l needs to be discussed
Conclusions

- significant association of elevated bT and severe or even fatal reactions to Hymenoptera stings, mainly in Vespula venom (VV) allergic patients
- tendency to more frequent and more severe reactions to sting challenge, but only significant in VV allergic patients
- nevertheless, such patients can be successfully treated by VIT

As a rule VIT should be continued for more than 5 years or even lifelong
Here’s to a future in which just milk and honey flow!

Thanks for everything you have done for us...!
Fatal anaphylaxis after a yellow jacket sting, despite venom immunotherapy, in two patients with mastocytosis

Oude Elberink J. et al, JACI 1997

<table>
<thead>
<tr>
<th>Venom-immunotherapy (VIT)</th>
<th>VIT-duration (years)</th>
<th>maintenance dose (μg)</th>
<th>interval stop-sting (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: 44 y., ♀</td>
<td>5</td>
<td>100</td>
<td>9</td>
</tr>
<tr>
<td>2: 43y., ♀</td>
<td>2.5</td>
<td>100</td>
<td>3</td>
</tr>
</tbody>
</table>
**Results**

Serum tryptase levels in relation to the responsible insect

<table>
<thead>
<tr>
<th>basal serum tryptase (μg/l)</th>
<th>≤ 13.5 μg/l</th>
<th>&gt; 13.5 μg/l</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honeybee (%)</td>
<td>151 (95.6)</td>
<td>7 (4.4)</td>
<td>158</td>
</tr>
<tr>
<td>Vespula (%)</td>
<td>89 (88.1)</td>
<td>12 (11.9)</td>
<td>101</td>
</tr>
<tr>
<td>Total (% of all pts.)</td>
<td>240 (92.7)</td>
<td>19 (7.3)</td>
<td>259</td>
</tr>
</tbody>
</table>

\[X^2 = 5.032, \ p=0.025\]