

MAST CELL TRYPTASE

**PAUL POTTER, MD, FCP (SA),
DCH (SA), FAAAAI, FACAAI**
**Director, Allergy Diagnostic and
Clinical Research Unit (ADCRU), UCT
Lung Institute and Groote Schuur
Hospital, Cape Town**

BARTHA FENEMORE,
Medical Technologist and Head
*Allergy Diagnostic and Clinical
Research Unit (ADCRU) Laboratory,
UCT Lung Institute, Cape Town*

Serum tryptase is a very useful marker for the detection of mast cell activation. Upon activation, mast cells release a variety of mediators that result in allergic reactions such as systemic anaphylaxis. Tryptase is found in the circulation after a patient suffers an anaphylactic reaction. The half-life of tryptase released into the circulation is considerably longer than that of histamine. Increased levels of tryptase peak at about 1 hour and can be detected from 3 to 6 hours after the anaphylactic reaction. Levels return to normal within 12 - 24 hours after release. An initial increase in tryptase levels followed by a sharp decrease indicates an allergic reaction. If the tryptase remains elevated at high levels, other conditions such as mastocytosis must be considered. Tryptase levels remain stable in stored serum samples for many months.

Indications

- Even when only one specimen can be taken, as in a postmortem case, it is a valuable indicator that anaphylaxis was a likely cause of death.
- We have found that one of the most useful clinical indications for the determination of tryptase levels is intraoperative anaphylaxis. Common drugs causing anaphylaxis

during surgery are the muscle relaxants, but latex allergy is also an important cause.

- A recently recognised indication for tryptase determination is the assessment of risk in bee venom-hypersensitive patients. Those who have elevated basal tryptase levels are at greater risk of severe anaphylactic reactions and of more serious adverse reactions during bee venom immunotherapy. In these patients tryptase levels can be used for ongoing monitoring of relative risk.
- Tryptase determination is a valuable marker for the diagnosis and monitoring of systemic mastocytosis.
- Tryptase levels are not raised in patients who have food allergies or atopic dermatitis, but may be useful in acute, severe food-induced anaphylaxis.

Local survey

A retrospective study of 221 patients tested at the Allergy Diagnostic and Clinical Research Unit of the UCT Lung Institute and Groote Schuur Hospital was recently conducted. Mast cell tryptase levels ranging from < 1.0 $\mu\text{g/l}$ to 13.5 $\mu\text{g/l}$ are considered to fall within normal limits. Thirty-nine of the samples submitted to our laboratory had levels > 13.5 $\mu\text{g/l}$. Seventeen postmortem specimens were tested and values from 3.73 $\mu\text{g/l}$ to 4275 $\mu\text{g/l}$ were found.

Specific collection

Venous blood is collected, allowed to clot and serum is separated. Ideally serial samples of 2 ml should be taken at 30 minutes to 1 hour, 2 - 3 hours and again at 12 - 24 hours to detect the characteristic rise and fall in tryptase levels during anaphylaxis. On a postmortem specimen a single sample can be taken up to 24 hours later and is informative if significantly elevated.