ImmunoCAP® Allergen c261 Pholcodine

Clinical Utility
Quaternary ammonium ions are considered to be the major allergenic epitopes in IgE-mediated anaphylaxis to neuromuscular blocking agents (NMBA), also called muscle relaxants. ImmunoCAP® Allergen c261 Pholcodine is a marker for sensitization to NMBA and is intended for use as a diagnostic tool in NMBA-induced anaphylaxis. A recent clinical study has shown that IgE testing using Pholcodine has somewhat higher sensitivity than Suxamethonium (1). ImmunoCAP® Allergen c261 Pholcodine is an alternative quaternary ammonium ion marker to morphine or suxamethonium, and may be recommended in regions where drugs containing Pholcodine are commonly used.

Allergen Description
Pholcodine is an antitussive morphine derivative sold in many countries as an OTC drug. The structure of pholcodine is similar to the quaternary ammonium ions found in NMBA, which contains a hydrophobic ring skeleton and two hydrophilic tertiary amines. It has been shown that pholcodine significantly increases the levels of IgE antibodies to NMBA in sensitized patients (2, 3). Pholcodine has also been proposed as the major sensitization agent in NMBA allergy (4).

Cross-Reactivity
Cross-reactivity between different NMBA is common since they all share the quaternary ammonium ion allergenic epitope (5). However, the extent of cross-reactivity varies considerably between patients and it is unusual for an individual to be allergic to all NMBA (6). The explanation for this limitation in cross-reactivity is that IgE antibody paratopes may not only recognize the quaternary ammonium ion; sometimes the molecular environment around the ammonium ion is also part of the allergenic epitope (4). The possibility of multiple allergies should therefore be considered.

Clinical Experience
It has been estimated that 60 % of all hypersensitivity reactions during anesthesia are IgE-mediated and that NMBA are responsible for 60 % of those reactions (7). The reported prevalence of anaphylaxis was 1 in 6,500 NMBA exposed patients (7). Anaphylactic reactions to NMBA tend to be severe and often life-threatening. Approximately 80 % of reactions were of grade III and IV (on a scale of I to IV) in a French study (5). Diagnosis of anaphylactic reactions during anesthesia can be difficult since, in most cases, a large number of drugs can have been administered to the patient. Follow-up investigation is therefore necessary in order to save the patient from a potentially life-threatening re-exposure to the offending drug (8). ImmunoCAP® Pholcodine was recently evaluated in a study with 25 rocuronium allergic patients (1). In this study a sensitivity of 86 % and a specificity of 100 % were recorded.
References


For further reading, see: www.immunocapinvitrosight.com