Mast cell tryptase and carboxypeptidase A3 (CPA3) as markers for predicting susceptibility to severe allergic drug reactions

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Introduction
Allergic drug reactions can present with diverse symptoms ranging from a mild skin rash to a life-threatening systemic reaction. However, there are no reliable means for predicting those at risk of a severe reaction. We have investigated serum levels of markers of mast cell activation in patients with allergic reactions of various severities to drugs.

Methods
Serum samples were collected from patients attending the Allergy Clinic at Southampton General Hospital, UK and the Queen Medical Hospital, Qatar and detailed information recorded on symptoms. Sensitive enzyme linked immunosorbent assays (ELISA) were developed and validated using specific antibodies prepared in our laboratory to tryptase and CPA3 (lower limits of detection of 0.4 ng/ml and 0.2 ng/ml, respectively).

Results
At baseline (when asymptomatic), serum tryptase and CPA3 levels were higher in patients who had previously suffered anaphylaxis than in those with mild or moderate reactions. Serum concentrations of tryptase and CPA3 did not increase significantly following experimental drug challenge, though the reactions provoked were in most cases restricted to mild skin reactions. There was a relatively poor association between levels of tryptase and CPA3, with some cases with low levels of tryptase and high levels of CPA3, and vice versa.

Conclusion
Measurement of baseline levels of tryptase and CPA3 may be of value in identifying patients at greater risk of severe allergic reactions to drugs. The lack of a strong correlation between levels of these markers would argue for a need to measure both.