

## CORRESPONDENCE

## Serum tryptase changes in children with suspected perioperative hypersensitivity. Comment on BJA Open 2024; 9: 100254

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Editor—We read with interest the recent publication by Vlaeminck and colleagues.<sup>1</sup> A dynamic change in the acute serum tryptase concentration (aST) from the basal serum tryptase concentration (bST) suggests mast cell degranulation and can be used to support a diagnosis of anaphylaxis. A new consensus formula,  $aST > bST + 0.71$ , has been proposed by Vlaeminck and colleagues to identify significant perioperative mast cell degranulation in the paediatric population. The current consensus formula<sup>2</sup> to support significant mast cell degranulation is  $aST > 1.2 \times bST + 2$ , and this is applied to adults and children. We seek to retrospectively validate the new formula against the current consensus formula in a paediatric perioperative allergy cohort.

We reviewed the records of all patients aged  $\leq 16$  yr who were assessed in our perioperative allergy service with suspected perioperative allergy at a teaching hospital in Sydney, Australia, between 1 July 2020 and 30 June 2024. This is approved by our local ethics committee (2023/ETH01234). We collected patient characteristics, details of the reaction, final diagnosis, peak and baseline serum tryptase concentrations, and analysis of the change in serum tryptase concentration based on the current consensus formula.<sup>2</sup> All tryptase measurements were processed using ImmunoCAP (Phadia AB, Uppsala, Sweden). We then applied the consensus formula proposed by Vlaeminck and colleagues to the serum tryptase results from the cohort.

Our perioperative allergy service reviewed 50 consecutive patients aged  $\leq 16$  yr. Of the 50 patients, 26 received a diagnosis of immediate hypersensitivity and 24 received a

diagnosis of non-immunological reaction. The median age was 10 yr for all patients evaluated and 13 yr when including only patients with immediate hypersensitivity. Characteristics of patients diagnosed with immediate hypersensitivity are listed in Table 1. Paired tryptase measurements were not collected in 12 cases; five of these cases were diagnosed with anaphylaxis and seven with non-immunological reactions.

Three cases of grade 3 anaphylaxis, one case of grade 2 anaphylaxis, and one case of grade 1 anaphylaxis demonstrated significant mast cell degranulation using the new consensus formula but were negative using the current consensus formula. Of these, four cases were of cefazolin anaphylaxis and one of rocuronium anaphylaxis. Two cases of non-immunological reaction had significant mast cell degranulation based on the new formula. The sensitivity and specificity of the new consensus formula in our cohort was 72.7% and 70.0%, respectively, compared with 50% and 59.3%, respectively, using the current consensus formula.

In our patient cohort, the performance characteristics of the new consensus formula proposed by Vlaeminck and colleagues were superior to those of the current consensus formula. Our study supports using the new formula in patients reviewed for suspected perioperative anaphylaxis aged  $< 16$  yr. The main limitation of our study is that our cohort is biased towards cefazolin anaphylaxis and the median age is 13 yr. The performance characteristics of the new consensus formula should be evaluated in more cohorts worldwide to ensure adequate performance for anaphylaxis to a wide range of culprit drugs and younger ages.

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**Table 1** Characteristics of 26 patients with a diagnosis of immediate hypersensitivity.

| Total patients (n)                | 26      |
|-----------------------------------|---------|
| Median age (yr)                   | 13      |
| Female, n (%)                     | 16 (62) |
| Culprit drug (n)                  |         |
| Cefazolin                         | 17      |
| Neuromuscular blocking agent      | 6       |
| Radiocontrast media               | 1       |
| Vancomycin                        | 1       |
| Latex                             | 1       |
| Grade of anaphylaxis <sup>3</sup> |         |
| 1                                 | 11      |
| 2                                 | 4       |
| 3                                 | 11      |
| 4                                 | 0       |

### Author's contributions

Study design: all authors

Patient recruitment: all authors

Data analysis: SG, JL

Writing of first draft of the manuscript: SG, JL

Manuscript review: all authors

### Declarations of interest

The authors declare that they have no conflicts of interest.

### References

1. Vlaeminck N, Poorten MV, Nygaard Madsen C, et al. Paediatric perioperative hypersensitivity: the performance of the current consensus formula and the effect of uneventful anaesthesia on serum tryptase. *BJA Open* 2024; **9**, 100254
2. Valent P, Akin C, Arock M, et al. Definitions, criteria and global classification of mast cell disorders with special reference to mast cell activation syndromes: a consensus proposal. *Int Arch Allergy Immunol* 2012; **157**: 215–25
3. Dewachter P, Savic L. Perioperative anaphylaxis: pathophysiology, clinical presentation and management. *BJA Educ* 2019; **19**: 313–20

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