

## Utility of the emergency department observation unit in anaphylaxis: a retrospective review

Gwyneth Calista Cheok<sup>1\*</sup>, Ziwei Lin<sup>1</sup>, Chengjie Lee<sup>1</sup>, Eunizar Binte Omar<sup>1</sup>, Jen Heng Pek<sup>1</sup>, Sze Jia Lam<sup>1</sup>

1. Emergency Department, Sengkang General Hospital, Singapore

**Correspondence to:** Gwyneth Calista Cheok

\*Emergency Department, Sengkang General Hospital, Singapore.

**Email:** gwyneth.cheok@mohh.com.sg

**DOI:** 10.24911/SJEMed.72-1743048040



### Introduction:

A biphasic reaction in anaphylaxis is described as a recurrence of anaphylaxis symptoms in the absence of re-exposure to the initial trigger and typically occurs between the first 6-12 hours, but up to 72 hours following the first reaction. The reported incidence of this phenomenon in the literature is variable. As such, some hospitals practice admitting patients to observation units following the index reaction for further monitoring. However, guidelines on the recommended duration of observation following anaphylaxis are limited.

### Objectives:

We aimed to evaluate the incidence and predictors of biphasic reactions in patients presenting to the emergency department (ED) with anaphylaxis, and its subsequent implications on the utility of admissions to observation units as well as the recommended duration of stay.

### Methods:

This was a retrospective study comprising patients aged 21 years old and above who were admitted to the observation unit in a public hospital in Singapore in the year 2023, following anaphylaxis (as defined by the World Allergy Organization Anaphylaxis Guidance 2020). Patients whose presentation did not meet criteria for anaphylaxis were excluded. Data was manually extracted from the electronic medical records. The outcome was that of a biphasic reaction, defined as a recurrence of symptoms meeting the criteria for anaphylaxis despite a lack of re-exposure to the initial trigger.

### Results:

We included a total of 112 patients (38.4% male, median age 40.5 years), of whom the incidence of biphasic reactions was 6 (5.4%). The characteristics of the patients' ED visits are presented. The median time to a biphasic reaction from the onset of the first reaction was 10.2 hours (interquartile range 6.1-13.1 hours) and had a range of 2.3-28 hours. Only 1 patient had a biphasic reaction that occurred more than 24 hours after the first reaction. Of all the patients admitted to the observation unit following anaphylaxis, 8 patients (7.1%) were subsequently admitted to the general wards, none of whom required further monitoring in the high dependency or intensive care units.

After univariate analysis, male sex [odds ratio (OR) 8.95, 95% confidence interval (CI) 0.94 – 84.74,  $p = 0.03$ ] and change in voice (OR 7.62, 95% CI 0.81 – 71.33,  $p = 0.046$ ) were found to be associated with biphasic reactions occurring in the ED observation unit. There were 69 (75.0%) patients who had delayed administration of intramuscular adrenaline (defined as administration of adrenaline after more than 60 minutes of symptom onset), but this was not significantly associated with biphasic reactions ( $p = 0.596$ ). After multivariable regression, male sex was associated with biphasic reaction (OR 10.69, 95% CI 1.15 – 98.79,  $p = 0.037$ ), while change in voice was of borderline significance (OR 9.22, 95% CI 0.99 – 85.51,  $p = 0.051$ ).

### Conclusion:

Our study identified male sex and change in voice as positive predictors of biphasic reactions in anaphylaxis. However, it remains a challenge predicting which patients will experience biphasic reactions, thus suggesting a utility in monitoring all patients presenting to the ED for anaphylaxis in an observation unit. In our cohort, the longest time to a biphasic reaction was 28 hours from the time of first reaction, although the majority of the biphasic reactions occurred less than 24 hours after the first reaction. More studies can be done to determine the optimal duration of observation for anaphylaxis patients.

### Keywords:

Anaphylaxis, biphasic reaction, emergency department.