Infusion reaction to anticancer therapy – is management optimised?

Lexi Lim[1], Marco Leong[1], Michelle Natoli[1], Robert Wojnar[1]

1 Pharmacy Department, Cabrini Health, VIC Australia

Introduction

Infusion reactions (IRs) are a frequent complication during anticancer therapy, ranging from mild symptoms to severe anaphylaxis.[1] These unpredictable, non-dose dependent reactions may be immune or non-immune mediated, posing challenges to both treatment efficacy and safety.[2]

Strategies to manage infusion reactions including slowing or stopping infusion and administering antihistamines or corticosteroids.[3] However, the lack of standardised protocols leads to variability in practice.

Aim

To determine the anticancer therapies associated with infusion reactions and evaluate acute management strategies for grade ≥2 reactions.

Methods

A retrospective audit of medical notes of patients who experienced an infusion reaction (grade ≥2) to systemic anti-caner therapy in the hospital's risk database between April 2022 and May 2024. Clinical trials, re-reactions to the same anticancer therapy and patients <18 years of age were excluded.

	Number (N = 95)	Percentage (%)
Age (years) (mean)	62	
Gender (Male)	27	28.4
BMI (mean)	26	
Cancer type		
Gastrointestinal/ colorectal/ liver/ pancreatic/ cholangiocarcinoma	14	14.7
Urological and renal	19	20.0
Breast	15	15.8
Lung	6	6.3
Haematological	35	36.8
Skin and connective tissue	6	6.3

Table 1: Patient demographics

Results

A total of 96 infusion reactions were documented across 95 patients undergoing treatment with various anticancer therapies. Demographic information is outlined in Table 1.

The rate of infusion reactions to all observed anticancer therapy with at least a single reaction during the study period is highlighted in Figure 1. There were a total of 80 grade 2 and 16 grade 3 infusion reactions observed.

The majority of infusion reactions were reported during cycle 1 (63.5%) and cycle 2 (21.9%) of therapy. There were 74 patients that were rechallenged under the same pathway and 69% (51 of 74) had a change to their pre-medication for the subsequent cycle (s). There were 15 patients that experienced subsequent re-reactions to the anti-cancer therapy.

The most common documented symptoms included flushing (32%), dyspnoea or hypoxia (27%), back and abdominal pain (25%), fever or shaking (20%), altered heart rate or blood pressure (20%), nausea / vomiting / diarrhoea (19%) and itch (16%).

The pharmacological treatment of infusion reactions (grade ≥ 2) generally included a combination of steroids and H1 antagonist as outlined in Figure 2.

Results (cont.)

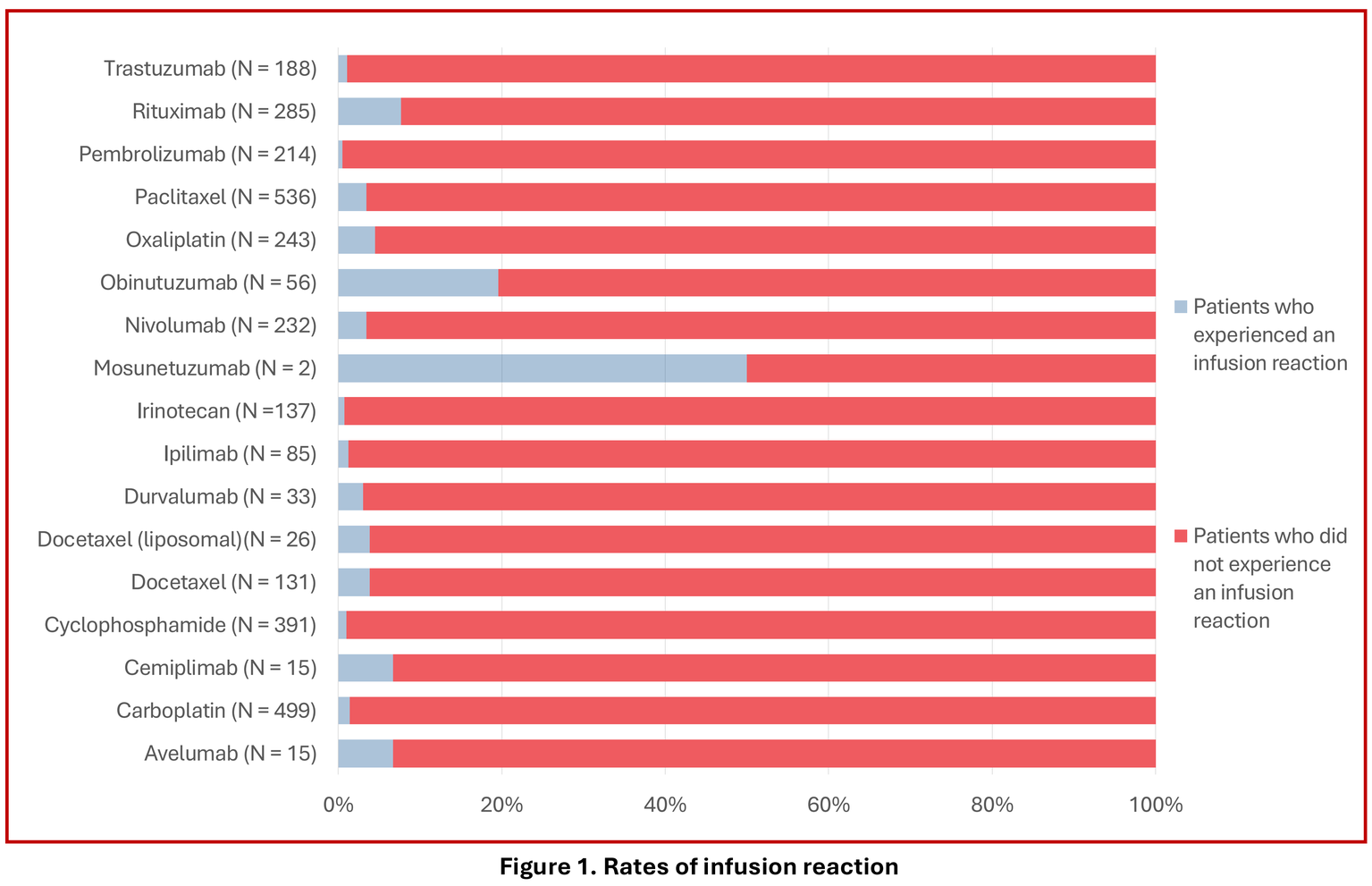

Figure 1. Rates of infusion reaction

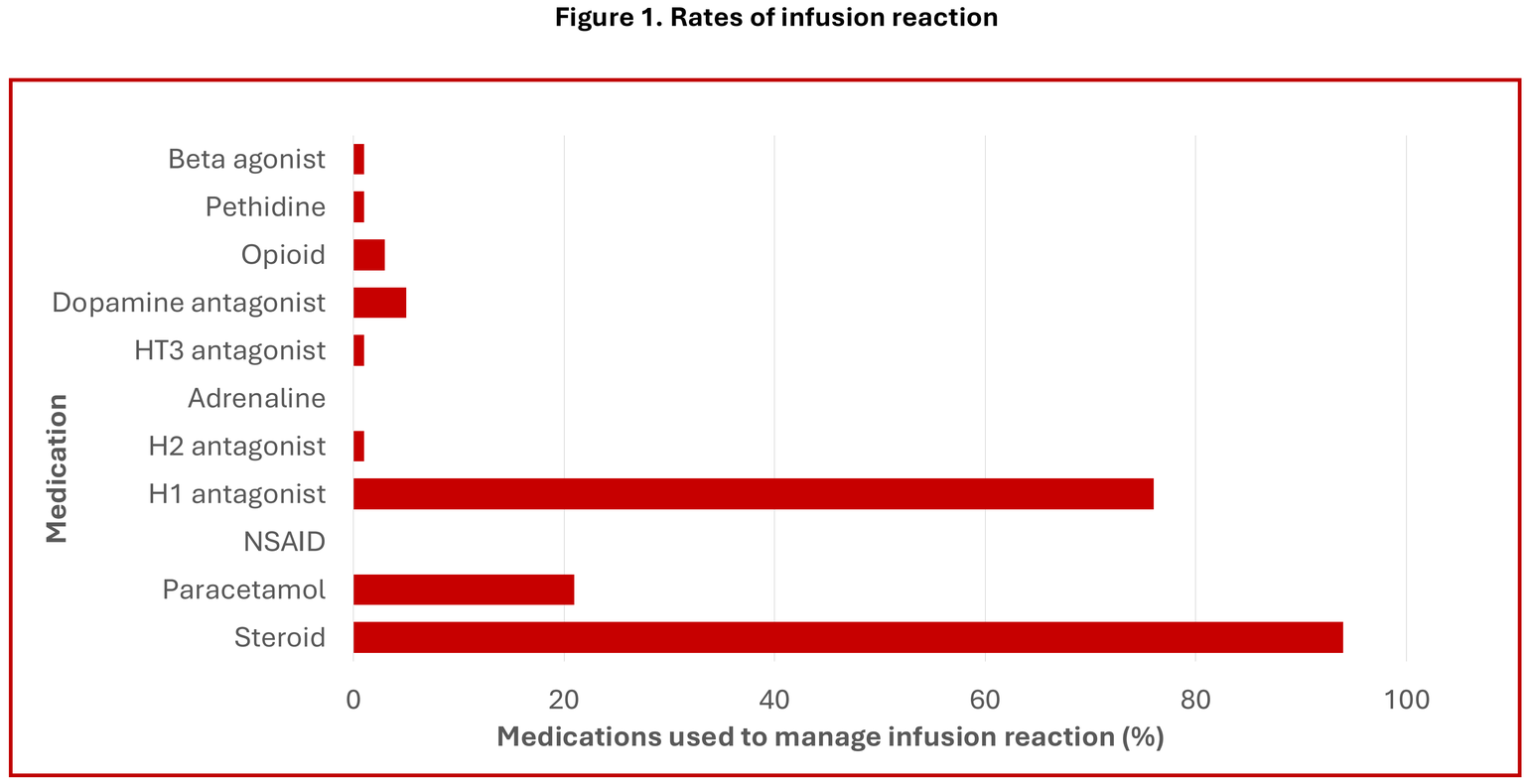

Figure 2. Acute management strategies for grade ≥2 infusion reactions to anticancer therapy

Discussion

Mosunetuzumab, obinutuzumab and rituximab showed the highest reaction rates within the study. The small sample size of mosunetuzumab poses a limitation in representing the true rate of reaction. The reaction rate of obinutuzumab in the literature (8-9%) is comparable to the results of the study.[4] Rituximab demonstrated significantly lower rate of reactions than published data (77% in the first cycle) likely due to the routine use of premedications and patients who may have had prior exposure.[5]

The European Society of Medical Oncology (ESMO) guidelines recommend a combination of measures to manage grade ≥2 infusion reactions including a slower infusion rate or short-term cessation and administration of intravenous H1 and/or H2 antagonists with corticosteroids.[3] The management at Cabrini is in line with these recommendations.

Implications

The findings of this study shows that there is a need for standardised protocols with pre-defined orders to manage infusion reactions (IRs). The variability in management approaches suggest that implementing clear, evidence-based guidelines could improve patient safety and treatment consistency. Additionally, therapies identified with higher IRs risks require closer monitoring and potentially tailored pre-medication strategies.

Limitations

- Misclassification bias – errors in coding patients correctly during screening
- Information bias – incomplete data collection, particularly undocumented information, as the hospital uses paper and medical charts with electronic medication records
- Limited sample size – the study may not be adequately powered due to the small sample size
- Generalisability – results may not be applicable to other settings

Conclusion

This study identified therapies such as mosunetuzumab and obinutuzumab as having higher rates of infusion reactions. The variability in practice highlights the need for standardised protocols to ensure more consistent and optimal care. Implementing structured treatment guidelines will improve patient safety and treatment outcomes for those at higher risk of infusion reactions.

References

1. Chung C. H. (2008). Managing premedications and the risk for reactions to infusional monoclonal antibody therapy. *The oncologist*, *13*(6), 725–732. https://doi.org/10.1634/theoncologist.2008-0012

2. UpToDate. (2024). Infusion reactions to systemic chemotherapy
https://www.uptodate.com/contents/infusion-reactions-to-systemic-chemotherapy

3. Roselló, S., Blasco, I., García Fabregat, L., Cervantes, A., Jordan, K., & ESMO Guidelines Committee (2017). Management of infusion reactions to systemic anticancer therapy: ESMO Clinical Practice Guidelines. *Annals of oncology : official journal of the European Society for Medical Oncology*, *28*(4), 100–118. https://doi.org/10.1093/annonc/mdx216

4. UpToDate. (2024). Obinutuzumab: Drug information
https://www.uptodate.com/contents/obinutuzumab-drug-information

5. UpToDate. (2024). Rituximab (intravenous) including biosimilars: Drug information
https://www.uptodate.com/contents/rituximab-intravenous-including-biosimilars-drug-information?

Cabrini RESEARCH