Minimisation of potential dosing errors with prednisolone mixture by implementing standardised dosing directions

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Background

The Victorian Poisons Information Centre reported an increased number of enquiries related to oral prednisolone mixture dosing errors in the paediatric population due to misinterpretation of dosing directions.[1] Ambiguous labelling directions were reported as likely to have contributed to these errors, potentially leading to adverse effects, over dosing, suboptimal dosing or reduced efficacy of prednisolone.[1] The Royal Children's Hospital Melbourne pharmacy elected to audit the labelling of prednisolone mixture to determine if labelling practices are potentially ambiguous and could contribute to medication misadventure.

Aim

To retrospectively audit and evaluate the dosing directions provided on prednisolone mixture dispensing labels and implement standardised dosing directions if labelling was found to be ambiguous.

Method

251 prednisolone mixture dispensing labels were evaluated over a one year period at The Royal Children's Hospital Melbourne, a tertiary paediatric hospital. The labels were evaluated for the following five criteria: Dose, Frequency of dosing, Timing of dosing, Length of Course and Advised to be given with food. A questionnaire was also prepared and distributed to the 39 staff pharmacists. The questionnaire included alternate dispensing directions for prednisolone mixture and respondents were requested to select directions that they thought best represented a 'gold standard'.

Results

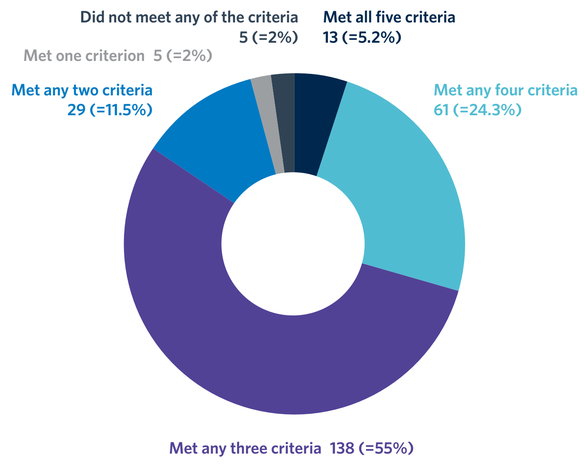

Figure 1. Proportion of oral prednisolone mixture dispensing labels containing 0 – 5 of the designated criteria (Dose, Frequency of dosing, Timing of dosing, Length of Course and Advised to be given with food)

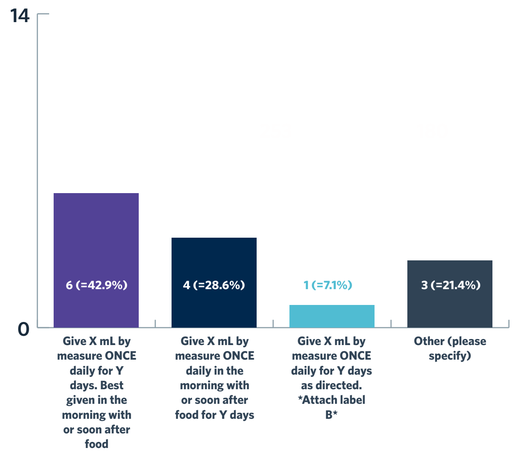

Figure 2. Staff pharmacist response to oral prednisolone mixture dispensing directions questionnaire

Discussion

Prednisolone is a corticosteroid medication possessing anti-inflammatory and immunosuppressive actions.[2] Short-term courses of prednisolone are frequently prescribed for paediatric respiratory conditions such as acute asthma and croup.[2,3] Depending on the indication, duration of treatment with prednisolone can range from a single dose to long-term treatment.

When prednisolone is prescribed as a once daily dosage regimen, misinterpretation of labelling directions has led to carers administering prednisolone multiple times per day.[1] Although such errors are unlikely to cause severe toxicities if given for a short duration of time, they can lead to adverse effects such as nausea, vomiting and restlessness.[1]

Misinterpretation of dosing directions should be reduced by the use of standardised dosing directions for oral prednisolone mixture. To achieve this, dispensing labels were evaluated and a questionnaire distributed to staff pharmacists to raise awareness of the issue and to provide a 'gold standard' for labelling prednisolone mixture. The standardised labelling directions for prednisolone mixture were derived from those recommended by Robinson et al in Australian Prescriber 2016;39:176. The standardised directions were implemented into Merlin®, the pharmacy dispensing software, to automatically pre-populate when dispensing oral prednisolone mixture.

Although the response rate to the questionnaire was low (35.9%), all pharmacists have been educated about the selected standardised dosing directions and are encouraged to reinforce these directions with comprehensive counselling. Future audits will be conducted to determine whether pharmacists are using the pre-populated standardised directions, as well as patient follow-up to determine whether carers correctly followed the intended directions.

Conclusion

Evaluating the labelling of prednisolone mixture has facilitated implementation of standardised dosing directions for prednisolone mixture. Pre-populating standardised dosing directions within dispensing software has enabled consistent and most likely safer labelling, reducing the risk of dosing regimen errors due to ambiguous labelling.

References

1. Robinson J, McKenzie C, MacLeod D. Paediatric dosing errors with oral prednisolone mixture. Australian Prescriber. 2016;39:176.
2. Smith M, Iqbal SMSI, Rowe BH, N'Diaye T. Corticosteroids for hospitalised children with acute asthma. Cochrane Database of Systematic Reviews. 2003;1:1-34.
3. Russell KF, Liang Y, O'Gorman K, Johnson DW, Klassen TP. Glucocorticoids for croup (Review). Cochrane Database of Systematic Reviews. 2011;1:1-105.

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