



A preliminary study to identify correlations between blood glucose levels and cardiorespiratory observations in acute asthma patients receiving nebulised salbutamol.



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Introduction

Physiological changes experienced by asthma patients receiving nebulised salbutamol in the acute setting primarily offer therapeutic effects. However, increasing blood glucose levels in some patients could cause metabolic effects that prolong exacerbations.^{1,2} Could these measurements better assist in maximising the therapeutic effects of salbutamol, whilst reducing the adverse effects?

Aim

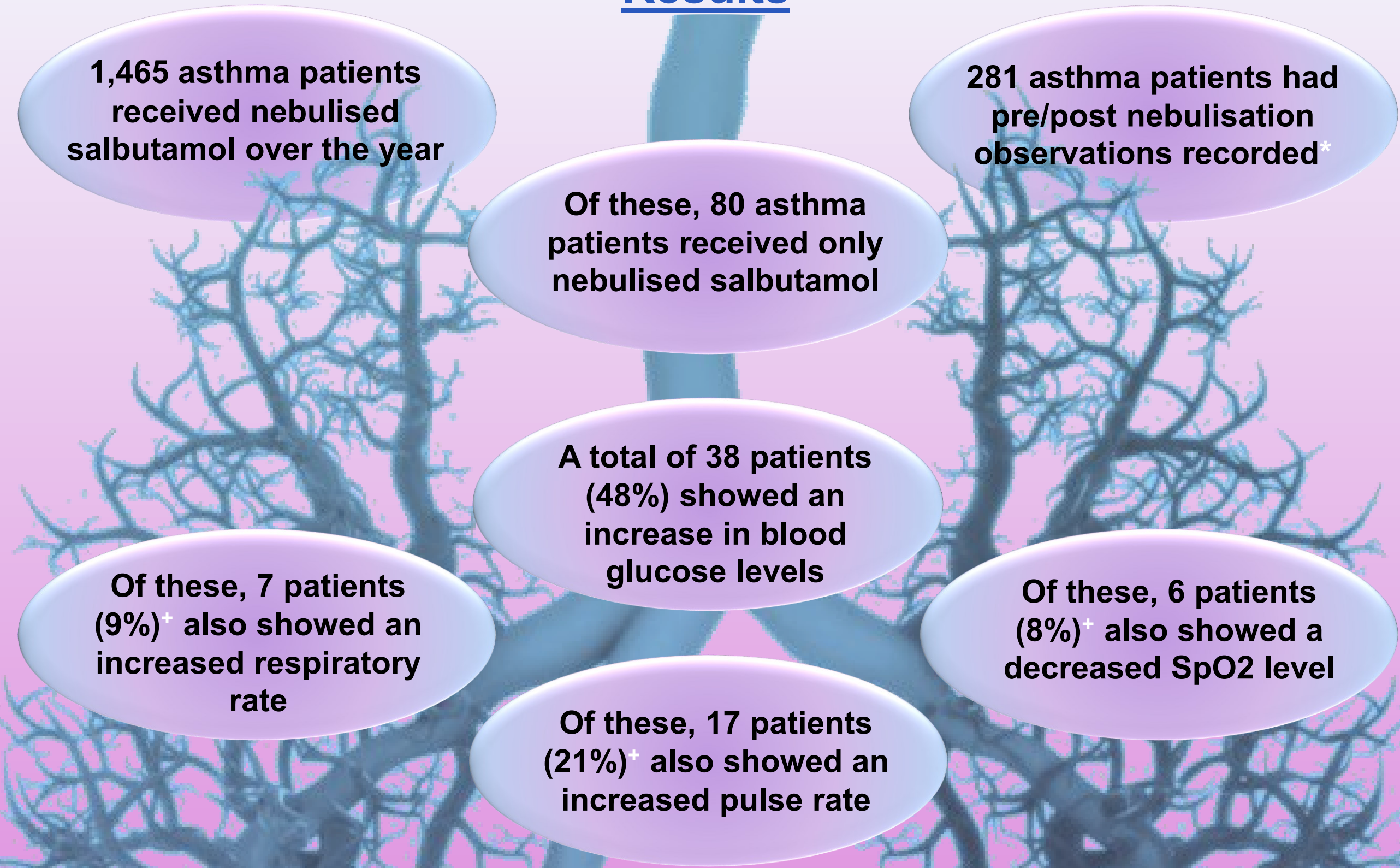
Examine the relationship between nebulised salbutamol, blood glucose levels and cardiorespiratory observations amongst asthma patients managed in the pre-hospital setting.

Methods

All pre-coded asthma calls were collated over a year from one UK ambulance service and filtered to identify those where at least two concurrent doses of nebulised salbutamol were administered. Patients that also received hydrocortisone or adrenaline as part of their treatment were removed, along with those that did not have pulse rate, respiratory rate, blood oxygenation (SpO2) and blood glucose levels recorded pre and post nebulisation.



Results



*Capillary Blood Glucose, Pulse Rate, Respiratory Rate, SpO2 Level
*Percentage calculated on patients only receiving nebulised salbutamol

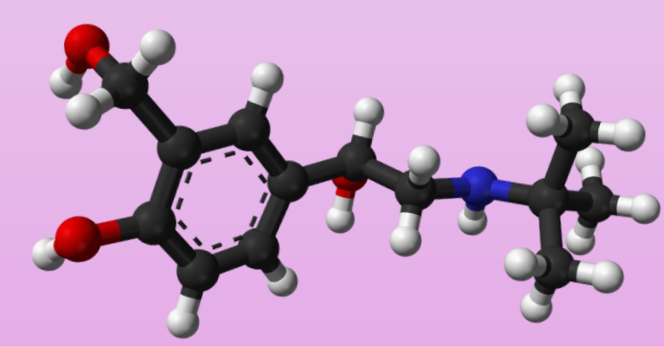
Conclusions

Although full parameters were not set, the potential for some asthmatics to have an underlying susceptibility to β_2 agonists such as salbutamol is shown by the number of patients that demonstrated an increased blood glucose level and other undesirable physiological effects following nebulisation. Whilst an increased heart rate is commonly seen in practice,³ the presence of increased respirations and/or decrease in SpO2 levels could suggest the presence of a perpetuating ventilation perfusion (V/Q) mismatch.

Ongoing Development

The potential for a correlation between these factors has led to the development of progressing studies which focus on the role nebulised salbutamol has in raising blood glucose levels and their subsequent affect on acute asthma exacerbations.

The first study, a systematic review looking at the effects of nebulised β_2 agonists on clinical observations in asthma exacerbations is also presented within this session.



References

1. Hsu, E. and Bajaj, T. (2020). Beta 2 Agonists. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing.
2. Billington, C. K., Penn, R. B. and Hall, I. P. (2017). B2-agonists. Handbook of Experimental Pharmacology, 237:23 - 40.
3. Farzam, K., Kidron, A. and Lakhkar, A.D. (2020) Adrenergic Drugs. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing.

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