Successful management of allergy to the insulin excipient metacresol in a child with Type 1 Diabetes: a case report

Insulin allergy has been extremely topical in paediatric diabetologist discussions over the last two years. As such, this article would be of interest to that group.

In general the article is excessively wordy and would benefit reducing to about 2/3 of the articles current word count. This would improve the flow of the article.
have made some recommendations below.
The description of the use of different preparations to isolate metacresol as the allergen was difficult to follow and would be better in table form.
The description and table of dose response in the discussion section is inappropriate and because it does not really add to the case and is poorly referenced, I would recommend removing it.

Abstract

“Insulin allergy, while less common since the introduction of human insulin, is still an issue in the management of diabetes. Suggested current rates range from <1% - 2.4%, these covering a spectrum from mild localised reactions that resolve with repeated exposure to life threatening anaphylaxis or death.”

Change to:

“Insulin allergy to human insulin preparations is suggested to occur at rates ranging from <1% - 2.4% in the treatment of diabetes. These reactions vary from mild localised reactions that resolve with repeated exposure to life threatening anaphylaxis and death.”

“Allergy to the Metacresol component of insulin has never been documented in the paediatric type I diabetes literature, and only once previously in the adult. As metacresol is universally present in all current insulin preparations, we believe it has been overlooked as a possible cause of insulin allergy in some past case reports.

Our novel approach to diagnosis of this rare situation is outlined, including our suggestions on how to investigate insulin allergy, particularly with commonly available agents via skin prick or sub dermal testing. These techniques are now more important, as commercially available insulin allergy test kits, as used in the past, are now not available. The current literature has not yet responded to this change in circumstance. Our protocol for desensitisation therapy, using continuous subcutaneous insulin infusion, with simultaneous central intravenous insulin infusion (as adapted from the literature is also highlighted.”

This is waffle and detracts from the case. These reactions are not rare (~2% as stated above and the old kits had the metacresol to test because it was a frequent offender). Change to:
“This is the first documented case of allergy to the Metacresol component of insulin in the paediatric type I diabetes literature. We describe an approach to diagnosis and management of metacresol allergy in type 1 diabetes.”

Introduction

“In the past, this has been made simpler by the availability of commercially available insulin allergy test kits, the use of which has been referred to in past protocols, reviews and case reports (5-7).”

Change to:

“In the past, this has been made simpler by the availability of commercially available insulin allergy test kits (5-7).”

“We present the first case of allergy to the insulin excipient metacresol in a child with T1DM, and describe a novel diagnostic approach using readily available preparations.”

Change to:

“We present the case of allergy to the insulin excipient metacresol in a child with T1DM, and describe a diagnostic approach and management.”

Case presentation

“The insulin preparations Glargine and Detemir were also trialled with worsening of localised symptoms. She elected at this stage to return to Humulin NPH® as her basal insulin. At this stage, her only significant past medical history was localised erythema to some soap and adhesive preparations.”

Change to:

“Glargine and Detemir insulins were trialled with worsening of localised symptoms. She had a past history was localised erythema to some soap and adhesive preparations.”

“Antihistamines were commenced, Loratidine and later Cetirizine, at 10mg daily increasing to 10mg twice daily. This resulted in some reduction in Humulin NPH® related symptoms, but with no effect on those of aspart.”

Change to:

“Antihistamines (Loratidine and Cetirizine) resulted in some reduction in Humulin NPH® related symptoms, but with no effect on those of aspart.”

The authors describe how they used a process of elimination to determine that metacresol was the offender. This is hidden in the text. This needs to be reworded to make it clear. An alternative would be a table with the components of each preparation listed (this could replace the table on the concentration of metacresol which appears to be useless information).

“Due to the increasing local reactions, 6 weeks from first presentation with insulin allergy a decision was made for admission and desensitisation therapy using insulin aspart via continuous subcutaneous insulin infusion (CSII). As our initial...
planned doses via CSII were extremely low, intravenous (IV) Actrapid® via a peripherally located central catheter was used, with the dose rate adjusted as needed to maintain normoglycaemia and prevent ketosis.”

Change to:
“Desensitisation therapy was commenced 6 weeks from first presentation. using insulin aspart via continuous subcutaneous insulin infusion (CSII). Intravenous (IV) Actrapid® via a peripherally located central catheter was used to prevent the severe local reaction during desensitization. The insulin dose rate was adjusted to maintain normoglycaemia and prevent ketosis.”

“Rates above this resulted in central chest discomfort and therefore smaller volume and more frequent carbohydrate was provided, and compensated for with a higher baseline basal rate of .3u/hour.”

Change to:
“Rates above this resulted in central chest discomfort.”

“On Day 2, adjustments to the protocol were made. The pump starting rate along with the same increments for increase were used, but aspart was diluted 10 fold using 0.9% saline to reduce the starting dose (0.0025u/hr aspart).”

Change to:
“On Day 2, the aspart was diluted 10 fold using 0.9% saline to reduce the starting dose (0.0025u/hr aspart).”

“Allergy to the Metacresol component of insulin has never been documented in the paediatric T1DM literature, and only once previously in the adult (8).”

Change to:
“We described a case of allergy to the Metacresol component of insulin in a 12 year old T1DM. Allergy to the metacresol in insulin has been described previously in an adult with T1DM (8).”

Delete the following:
“To further support a diagnosis of metacresol allergy, a dose response relationship was observed, with the severity of localised reaction generally related to metacresol concentration (table 1).

Table 1: From left to right in order of increasing severity of localised reaction/pain.”

The section following this is excessively long and needs rewriting to improve the flow.

Quality of written English: Acceptable

Declaration of competing interests:
I declare that I have no competing interests