

## A Non-Atopic Crohn's Disease Patient with Hydrocortisone Induced Anaphylaxis

**Sakinah N Alshayeb<sup>1\*</sup>, Fadi N Busaleh<sup>2\*</sup>, Nooralhuda A Alhadeb<sup>2</sup>, Hashem A Alomran<sup>2</sup>, Hamedah A Albahrani<sup>2</sup>, Maali J Alali<sup>2</sup>, Maryam H Alessa<sup>2</sup>, Rabab M Alshakhiss<sup>2</sup>, Mohammed A Alsubaie<sup>2</sup>, Nazihah A Alnowaiser<sup>2</sup>, Ali I Alali<sup>3</sup>, Jaber A Alhabeeb<sup>4</sup> and Mujtaba Ahmed AL-Yaseen<sup>3</sup>**

<sup>1</sup>Medical Intern, College of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

<sup>2</sup>Pediatric Resident, Pediatric Department, Maternity and Children Hospital, Alahssa, Saudi Arabia

<sup>3</sup>Pediatric Specialist, Pediatric Department, Maternity and Children Hospital, Alahssa, Saudi Arabia

<sup>4</sup>Pediatric Allergy Immunology Consultant, Pediatric Department, Maternity and Children Hospital, Alahssa, Saudi Arabia

**\*Corresponding Author:** Sakinah N Alshayeb, Medical Intern, College Of Medicine, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia and Fadi N Busaleh, Pediatric Resident, Pediatric Department, Maternity and Children Hospital, Alahssa, Saudi Arabia.

**Received:** January 27,2020; **Published:** February 12, 2020

### Abstract

Glucocorticoids are potent immunosuppressive. It considers a corner stone in management of allergic reactions and anaphylaxis. Allergic reactions glucocorticoids are rare and not well known. We report a case of 12-years old Saudi male with Crohn's disease who had anaphylactic reaction to systemic hydrocortisone inform of mucocutaneous involvement and respiratory distress which happened after previous sensitization. The symptoms resolved immediately after withdrawing of hydrocortisone and concurrent administration of anaphylaxis's rescue medications which are epinephrine and diphenhydramine. Patient not known to allergic to any medications before or atopy. Even that reported cases of glucocorticoids were associated with history of atopy, which is not shown here. Finally, this is an immediate hypersensitivity reaction (anaphylaxis) to corticosteroids which should rise the that all healthcare providers especially those who prescribe systemic glucocorticoids to be aware of corticosteroid-induced reactions whither acute or chronic, to avoid a potentially fatal side effect.

**Keywords:** *Non-Atopic Crohn's Disease; Hydrocortisone; Anaphylaxis*

### Introduction

Since the late 1940s, corticosteroids have been widely used in the management of inflammatory, allergic, and autoimmune diseases because of the immunosuppressive and anti-allergenic proprieties [1-3]. In addition, It can be used in variety of ways either to be applied locally or to be used systemically [2]. These properties allow multiple medical specialties to use them in the management of different diseases wither acutely or chronically. Even though it is used in anaphylaxis and allergic reactions, there are some cases of hypersensitivity lead up to anaphylaxis to corticosteroids [3,4]. We report a patient with Crohn's disease who developed anaphylactic reaction following administration of intravenous hydrocortisone.

### Case Report

12 years old Saudi male patient, with one year history of Crohn's disease. He was prescribed by his Gastroenterologist to be on infliximab periodically as management of Crohn's for which was pre-medicated each time by hydrocortisone and diphenhydramine as recommended by manufacturer company. During 5th and 6 admissions for Infliximab infusion at Maternity and Children hospital in Alhassa in Saudi Arabia, he developed an immediate systemic reaction to steroids.

On 5<sup>th</sup> admission for infliximab, as the usual patient was premedicated with hydrocortisone initially in a dose of 3.57mg/kg. Within few minutes of inflow of intravenous hydrocortisone he started to have systemic reaction in form of generalized urticaria and skin erythema all over the body. This was managed immediately by administration of intramuscular epinephrine in a dose of and oral diphenhydramine in a dose of, with holding of hydrocortisone transfusion and patient kept under observation with no subsequent systematic reaction for the next four hours.

On 6<sup>th</sup> admission patient received hydrocortisone again as 6 mg/kg/dose (130 mg/dose) which is considered low dose for his age and weight according to the protocol of infliximab infusion by the manufacturer company, who suggests that patients that's are 12 years of age and more should receive 200 mg of corticosteroid as premedication of infliximab infusion. Few minutes of administration of hydrocortisone, he developed anaphylactic reaction in form of generalized skin erythema and urticaria all over the body and shortness of breath, with no hoarseness of voice. Upon examination patient was in respiratory distress in form of tachypnea (respiratory rate was 29 breath/minute), maintain his saturation on room air 99% and able to talk freely with patent air ways and equal bilateral air entry with vesicular breathing and no added breathing sounds. He was tachycardic with heart rate of 129 beat/minute, maintaining his blood pressure 120/78 mmHg, normal heart sounds without any murmurs, and capillary refill time was less than 2 seconds. Associated with generalized urticaria and skin erythema, with mucous membrane involvement inform of swollen lips. Hydrocortisone infusion were immediately held, and rescue medications for anaphylaxis were given including intramuscular epinephrine, intravenous diphenhydramine and the patient was kept on oxygen with cardiopulmonary monitoring. This resulted in immediate resolution of most of his symptoms within few minutes, except erythema which was resolved within an hour. Consequently, the patient was labeled to have corticosteroids allergy, and he was kept for 24 hours for observation of any subsequent late hyper-sensitivity reaction, then discharged home next day.

The four preceded admissions for infliximab infusion were also premedicated with hydrocortisone with the same doses but no reaction observed. Also, upon the initial diagnosis of Crohn's disease there was an induction dose of methylprednisolone followed by oral prednisolone, which was tapered slowly till discontinuation, without any adverse reaction. In reviewing the past medical history, the patient doesn't have eczema, asthma, or allergic rhinitis. Also, he is not known to have any food or medication allergy and has no family history of allergic disease.

### Discussion

Although systemic glucocorticoids have been widely used to treat allergic reactions, there is an increasing number of cases reports indicates that hypersensitivity or allergic reaction to glucocorticoids happen despite their anti-allergic properties [4].

There are four types of hypersensitivity reactions which are: type (I) immediate reaction which is an IgE mediated reaction that needs a previous sensitization, example of that is anaphylaxis. Type (II) cytotoxic reaction which is antibodies mediated reaction like in case of blood transfusion related hemolytic reaction. Type (III) immune complex deposition, which is antigen-antibody mediated reaction like in serum sickness, and finally type (IV) delayed reaction which is T-cell mediated like in contact dermatitis [5].

Most of the hypersensitivity reactions to steroids are either immediate (type I) or delayed (type IV) allergic reactions [3]. This is observed in our patient as he developed immediate allergic reaction after systemic administration of hydrocortisone, which is preceded by a previous sensitization through administration of hydrocortisone.

Patient with immediate hypersensitivity to glucocorticoids, reported a variety of signs and symptoms including urticaria, hoarseness of voice, shortness of breath, rashes, hypotension, angioedema, anaphylaxis and cardiovascular collapse [3]. Anaphylaxis is diagnosed when any 1 of the 3 following clinical criteria is fulfilled:

- Acute onset of an illness (minutes to several hours) with involvement of mucocutaneous region (e.g. generalize hives, pruritus or flushing, swollen lips/tongue/uvula) and at least one of the following: respiratory compromise (e.g. dyspnea, bronchospasm, wheeze, stridor, reduce peak PEF, hypoxemia) hypotension, or end-organ dysfunction (syncope, incontinence, hypotonia).
- Rapidly affect two or more systems which occur after exposure to a likely allergen for that patient (minutes to several hours): reduced blood pressure or associated symptoms (e.g. syncope, incontinence, hypotonia [collapse]), respiratory compromise (e.g. dyspnea, bronchospasm, wheeze, stridor, reduce peak PEF, hypoxemia), persistent gastrointestinal symptoms (e.g. campy abdominal pain, vomiting), or mucocutaneous region (e.g. generalize hives, pruritus or flushing, swollen lips/tongue/uvula).
- Evidence of Hypotension after exposure to an allergen known to cause symptoms for that patient (minutes to several hours): for infants and children/low systolic blood pressure (age specific) or decline of systolic blood pressure of more than 30% compared to baseline, for adult/systolic blood pressure less than 90 mmHg or decline of systolic blood pressure of more than 30% [5].

Our patient developed anaphylaxis by meeting the first criteria mentioned in form of mucocutaneous involvement (urticaria and swollen lips), and respiratory system involvement in form of shortness of breath and respiratory distress. To confirm the diagnosis of glucocorticoids hypersensitivity, we need skin prick test [6] which is unfortunately not available in our hospital, however, the diagnosis of glucocorticoids hypersensitivity was confirmed in our patient through the two observation of hypersensitivity reaction with administration of corticosteroid and abrupt cessation of symptoms after the discontinuation of hydrocortisone.

The mechanism of immediate hypersensitivity reaction due to glucocorticoids can be Ig E mediated (anaphylactic) which need a previous exposure (sensitization) to be developed as observed in our patient or non IgE-mediated (anaphylactoid). The two mechanisms are clinically indifferent [3]. According to Amit Nahum who investigate three patients with severe hypersensitivity to glucocorticoids by skin prick test found that two patients had positive skin prick test to methylprednisolone sodium succinate and the third patient had non-IgE mediated reaction explained by a negative skin prick test [6].

The most common reported agent that cause hypersensitivity reactions were hydrocortisone and methylprednisolone [4]. Those reports correspond with our patient as he developed hypersensitivity to hydrocortisone.

Usually the hypersensitivity reactions to corticosteroids are observed with locally applied medications and rarely observed with parenteral one, this in oppose of our patient as he developed anaphylaxis to systemic steroids [7].

Because glucocorticoids are poorly soluble, for pharmacotherapy they are mixed with sodium succinate esters, it is interesting that there are few case reports that had positive skin prick test for methylprednisolone sodium succinate and negative for unconjugated non-esterified glucocorticoids. Amit Nahum mention that some found that the hypersensitivity due to the dissolvent materials not the corticosteroids itself [6].

Interestingly, the presented cases of corticosteroids hypersensitivity had a history concurrent allergic disease such as bronchial asthma, and food allergy, which in oppose of our patient as he had no history of allergic diseases, food, or medication allergies noted before [4,6].

### Conclusion

Corticosteroids are one of the main cornerstones of the management of allergic conditions and hypersensitivity reactions, but even though it can be a triggering factor for such. hydrocortisone and methylprednisolone are the most reported corticosteroids to cause hypersensitivity reactions.

## Bibliography

1. Benedek TG. "History of the development of corticosteroid therapy". *Clinical and Experimental Rheumatology* 29 (2011): S1-S5.
2. Hazra A., *et al.* "Pharmacokinetics of methylprednisolone after intravenous and intramuscular administration in rats". *Biopharmaceutics and Drug Disposition* 28.6 (2007): 263-273.
3. Baeck M., *et al.* "Allergic hypersensitivity to topical and systemic corticosteroids: a review". *Allergy* 64 (2009): 978-994.
4. Lehmann S and Ott H. "Glucocorticoid hypersensitivity as a rare but potentially fatal side effect of paediatric asthma treatment: a case report". *Journal of Medical Case Reports* 2.1 (2008).
5. Kliegman R., *et al.* Nelson textbook of pediatrics: 1144, 1133.
6. Nahum A., *et al.* "Severe Hypersensitivity Reactions to Corticosteroids in Children". *Pediatric Emergency Care* 25.5 (2009): 339-341.
7. de Sousa NG., *et al.* "Systemic corticosteroid hypersensitivity in children". *Journal of Investigational Allergology and Clinical Immunology* 20.6 (2010): 529-532.

**Volume 9 Issue 3 March 2020**

**©All rights reserved by Sakinah N Alshayeb., *et al.***