

## JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH

### How to cite this article :

GUPTA S, SINGH MM, PRABHU S, PRABHU M, MISHRA P. ALLERGIC CONTACT DERMATITIS WITH EXFOLIATION SECONDARY TO CALAMINE/DIPHENHYDRAMINE LOTION IN A 9 YEAR OLD GIRL. *Journal of Clinical and Diagnostic Research* [serial online] 2007 June [cited: 2007 June 4]; 3:147-150

Available from

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## CASE REPORT

### Allergic Contact dermatitis with exfoliation secondary to calamine/diphenhydramine lotion in a 9 year old girl

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#### ABSTRACT

Calamine/diphenhydramine lotion is a bland, smoothening, antipruritic lotion commonly used in several dermatological conditions. Skin reactions due to this preparation are very rare. We report a case of contact dermatitis following the application of Calamine/diphenhydramine in a 9 year old child. The drug was stopped and the patient was managed symptomatically. The causality, severity and preventability assessments were carried out as per the standard criteria. We could not confirm the exact cause behind the adverse drug reaction (ADR) as the child's parents was not willing for rechallenge. Since calamine is made up of zincoxide and ferric chloride, the exact compound that might have caused the ADR is not confirmed. Since Calamine/diphenhydramine is a commonly used preparation, one should be aware of this reaction.

#### Introduction

Calamine is basic zinc carbonate coloured with ferric oxide. Calamine had mild astringent and antipruritic actions and is used as a dusting powder, cream, lotion, or ointment in a variety of skin conditions[1]. Diphenhydramine is a H<sub>1</sub>-antihistaminic used in allergic conditions, which is known to cause skin hypersensitivity. Contact dermatitis is an acute or chronic skin inflammation, occurring due to contact with irritant or allergic substances[2]. Topical antibiotics and topical anesthetics are usually implicated in contact dermatitis[3]. Contact dermatitis due to calamine lotion per se is not reported in the literature. There are rare reports of contact dermatitis due to

diphenhydramine[4]. We hereby report a case of contact dermatitis due to calamine/diphenhydramine lotion in a nine year old female child. We also established the causality, severity and preventability assessments of the reaction as per the Naranjo scale[5], Hartwig scale [6] and the Modified Schummock and Thornton scales [7] respectively.

#### Case report

A nine year old girl presented to Dermatology OPD, Manipal Teaching Hospital, Pokhara, Nepal, with complaints of itching and wheals of two days duration. There was neither any history of fever, throat ache, dyspnoea, dysuria, pain abdomen, nor any new food or drug intake. On examination, patient was conscious and cooperative, with stable vitals and no abnormality was detected on systemic examination. On local examination, evanescent, erythematous, oedematous well defined plaques were seen over neck, chest and right forearm. There was no maculopapular rash, target lesions or angioedema.

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She was diagnosed as Acute Urticaria. A complete blood count and urine routine examination revealed no abnormalities. She was advised Tab. Cetirizine 10mg 1 tab. HS, Tab. Ranitidine 150mg 1 tab. Twice daily (a.c.) for 1 week, Tab. Albendazole 400mg 1 tab. h.s. stat, along with calamine/diphenhydramine lotion for local application twice daily.

Five days later she presented to the Dermatology OPD, with burning sensation and pruritus over the sites of application of calamine/diphenhydramine lotion. On examination, dry, rough skin with pin head sized papules were evident over both forearms, and there was xerosis and exfoliation of the skin over the neck.

Considering the history and clinical findings, a provisional diagnosis of allergic contact dermatitis with exfoliation due to calamine/diphenhydramine lotion was made. Calamine was stopped and the patient was put on emollient along with fluticasone cream, to be applied twice daily for 2 weeks. She was advised to continue Tab. Cetirizine 10mg 1 tab. once daily for 10 days and Tab. Ranitidine 150 mg 1 tab twice daily for 1 week. Patient was followed up after 10 days. The lesions had subsided. The patient did not consent for a patch test, and so was advised to avoid calamine lotion in future.

Upon reporting the ADR to the Pharmacovigilance cell, the Pharmacists carried out the Causality assessment, severity assessment and preventability assessment of the ADR as per the Naranjo scale, Hartwig scale and the Modified Schumock and Thornton scales respectively. The causality assessment revealed the ADR to be 'Probably' associated with the drug. Similarly the severity assessment revealed the ADR to be 'Moderate Level 3' suggesting that The ADR requires that the suspected drug be withheld, discontinued or otherwise changed. It was found that the ADR was 'not preventable'.

### **Discussion:**

Allergic contact dermatitis is an exogenous eczema which is a delayed type hypersensitivity response, mediated when the allergen is engulfed and processed and presented to the dermal T cells by the Langerhans cell, the antigen presenting cell in the epidermis[2]. Clinically, it may present in varying forms ranging from erythema, vesication, erosion, crusting, scaling and exfoliation (peeling) and is usually associated with variable itching. Though, in most cases, a clinical suspicion is sufficient for diagnosis, a definite diagnosis is made only by a patch test [8].

Calamine is widely used in the field of dermatology as a smoothening, antipruritic agent in manifest conditions like urticaria, insect bite reaction, varicella, herpes zoster and pruritus. During our literature review we could not locate any reports of contact dermatitis due to calamine lotion per se. We suspect that the allergic contact dermatitis in this case could have been caused by diphenhydramine, which was also a component of this particular formulation of calamine lotion.

In one case report, a 59-year-old woman experienced vesicular dermatitis after applying Pellisal-Gel(R), a diphenhydramine-containing cream, for an insect bite. Skin patch testing revealed the patient was positive for diphenhydramine[9]. A 53-year old male who was treated with diphenhydramine for 5 years by varying routes including oral, topical, and injection in the treatment of a pruritic eruption as the result of hair dye dermatitis, was noted to have a contact allergic dermatitis for the same, (with no dermatitis on the scalp) which coexisted with a photoallergic dermatitis that worsened in summer and improved in winter[10].

Upon occurrence of contact dermatitis, the causative agent should be identified and removed[2]. In our case, the treatment with calamine/diphenhydramine lotion was stopped immediately following which the patient improved. The management of contact dermatitis include oral, topical steroids and smoothening agents[8]. Our patient was managed with topical steroids and Vitamin E cream as the lesions were only moderately severe. We could establish a probable causal relation ship (Naranjo score 6) [5] between calamine/diphenhydramine and the reaction.

The severity assessment revealed the ADR to be Moderate (Level 3) [6] suggesting that the suspected drug be withheld, discontinued, otherwise changed, and/or on antidote or other treatment is required. There was no increase in length of stay. Since this patient did not have a history of skin reaction due to calamine/diphenhydramine, this reaction was unpreventable. Our observation is supported by the Modified Schumock and Thornton scale[7].

**Table/Fig 1**



Dry rough skin with exfoliation over neck and upper back

Though we could establish a 'probable' causal relationship between the drug and the ADR, we failed to confirm as the child's parents was not willing for rechallenge. We also could not carryout the patch test. Since calamine is made up of zinc oxide and ferric chloride, the exact compound behind the cause of the ADR is not confirmed. Moreover, the possibility of excipients causing such an ADR also cannot be ignored.

**Table/Fig 2**



Dry rough skin with exfoliation over neck with erythema extending to the chest

**Conclusion:** Calamine/diphenhydramine is a commonly used combination for smoothing irritated or itchy skin as diphenhydramine, having antipruritic as well as mild local anaesthetic activity, compounds the smoothing effect of calamine. Diphenhydramine is a commonly prescribed systemic antihistaminic, which is available as an over the counter medication in many countries for a myriad of conditions including nasal allergy and common cold. Since calamine is a commonly used drug, one should be aware of this particular reaction, and as far as possible combination of calamine and diphenhydramine is to be avoided. Upon occurrence of this reaction, the drug should be stopped and the patient should be managed accordingly. We would have liked to patch test the patient with calamine as well as calamine/diphenhydramine to definitely establish the causality of the reaction. This couldnot be done as the child's parents did not consent for the same.

**Conflict of Interest:** None declared

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