

Accidental Overdosing with Diphenhydramine after Topical Application of an Antipruritic Lotion

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Abstrak

Telah dilaporkan sebuah kasus keracunan antihistamin difenhidramin pada seorang bayi perempuan berumur 3 bulan, berupa tidur yang dalam selama 2 hari, setelah pelumuran bedak kocok anti-gatal. Faktor-faktor yang meningkatkan penyerapan obat lewat kulit memang terdapat pada kasus ini. Diagnosis keracunan difenhidramin ditegakkan dengan meneteskan reagen MARQUIS pada popok bayi yang mengandung urin kering. Timbulnya warna kuning yang sangat kuat pada popok bayi tersebut membuktikan adanya difenhidramin serta metabolitnya di dalam urin dalam kadar yang tinggi. Bayi tersebut bangun seperti biasa pada keesokan harinya setelah pelumuran dengan bedak kocok dihentikan dan badan bayi dicuci bersih dari sisa-sisa bedak kocok. Disarankan agar pada botol bedak kocok yang mengandung difenhidramin dicantumkan juga peringatan agar digunakan secara hati-hati, terutama pada anak-anak, oleh karena dapat menimbulkan keracunan.

Abstract

A case of non-fatal accidental overdosing after topical application of a diphenhydramine containing lotion in a 3-month-old child, resulting in oversedation, is reported. Factors enhancing percutaneous absorption of the antihistamine were present. The diagnosis of diphenhydramine poisoning was established by reacting the dried urine on the diaper with the MARQUIS reagent. The resulting intense yellow colour indicated a high concentration of diphenhydramine and its metabolic products. The child woke up uneventfully the following day after discontinuation of the topical applications and washing off the body of any remnant of the lotion.

Keywords : Diphenhydramine overdosing, Topical application, Antipruritic lotion

INTRODUCTION

A well-known side-effect of H₁-blocking type of antihistamines is drowsiness and sedation, usually encountered when administered orally or parenterally. This is particularly true for diphenhydramine^{*,1,2}. However, no medical report could be found in Indonesia on diphenhydramine causing oversedation after topical application.

We like to report a case of accidental overdosing in a 3-month-old child, suffering from prickly heat, who slept deeply for 2 whole days, after several applications of a lotion containing diphenhydramine.

CASE REPORT

A 3-month-old female child was brought to our family practice clinic for consultation. The young mother, who came accompanied by her mother, was worried as

the usually lively child "slept" continuously for the past two days. Her daily consumption of bottled milk was uninterrupted while urinary excretion and defaecation were normal.

Examination of the child revealed a peaceful "sleeping" baby, rather too warmly clad in apparently good nutritional condition with normal body temperature. The patella and the pupil-light reflexes were normal. No stiffness of the neck could be detected. When the child was forcefully pinched in the thigh, it cried for an instant, while withdrawing and flexing the thigh to continue its sleep.

Any oral medication to the child was denied. When all the clothing, including the diapers were removed from the child, a rash could be detected at the neck, the chest, the back, the axillae and the groins, indicating miliaria rubra or prickly heat. Some parts of the skin were denuded with signs of infection. A thin

layer of whitish powder with camphor-like odour could be seen over above-mentioned areas of the body.

Careful questioning revealed that the over-loving grandmother had applied an anti-prickly heat lotion several times to her first-born granddaughter, after which the child was extra warmly and tightly clad. The child slept deeply after the second application. The lotion used was a left-over from the father, who bought it over the counter for his prickly heat some weeks earlier. It was applied by the grandmother three times a day during the past two days; the last application being early that morning.

The label describing the composition of the lotion listed among others : 2% diphenhydramine HCl. The antihistamine component was strongly suspected as the cause of the oversedation.

This proved to be right when the diaper in which the child had urinated was tested with the MARQUIS reagent.³ The diaper turned intense yellow, indicating a high concentration of diphenhydramine and its metabolic products.

No causal therapy was prescribed for the child. The mother was instructed to carefully wash the child's body to remove any remnant of the lotion and to dress the child lightly.

The grandmother was reminded not to apply the anti-pruritic lotion to her granddaughter again. They were sent home with the assurance that the child will wake up the following day.

The following morning the mother called to tell that the child woke up uneventfully and was as lively as usual.

DISCUSSION

The diagnosis of a child in deep sleep was established when neurological changes were ruled out.

Overdosing of the antihistamine diphenhydramine as the cause was strongly suspected as the anamnesis revealed that the child began to sleep after the topical application of the lotion.

Absorption through the skin is known to occur as the skin is not impermeable to topical drugs. In addition, factors enhancing absorption of the drug were present, such as:

- a. the not completely developed epidermal barrier function of the skin in this 3-month-old child
- b. the frequent applications of the lotion over a large area of the body
- c. the presence of denuded areas and
- d. the tightly wrapped diapers and warm clothing acting as an occlusive dressing⁴

Based on the method for the estimation of the extent of burns, it was estimated that approximately 30% of the patient's total body surface was covered with the lotion.⁵

Assuming a topical application of 5-10 ml. lotion each time, three times a day, the lotion applied would contain approximately 300-600 mg. of diphenhydramine HCl. If just one tenth of this amount is absorbed through the skin, then 30-60 mg. of the anti-histamine would have entered the child's body within 24 hours.

With above-mentioned factors augmenting percutaneous absorption, it is not too difficult to understand that this resulted in oversedation of the child. (The recommended oral daily dose of diphenhydramine for adults is 60-100 mg.)

The intense yellow colour produced with the MARQUIS reagent on the dried urine on the diaper confirmed our diagnosis of diphenhydramine overdosing. Another supportive evidence was that the child woke up uneventfully the following day.

Diphenhydramine is metabolised largely by the liver and is excreted by way of the urine. Following an usual dose, no metabolic product of diphenhydramine could be detected in the urine after 24 hours.¹

Diphenhydramine is frequently encountered as an anti-allergic component in many medical formulations. Because of its anti-pruritic activity it is also found in many skin lotions and cremes.⁶

There are not many reports of diphenhydramine toxicity after topical applications. A literature search revealed one case in a child with varicella, treated with a diphenhydramine lotion and a diphenhydramine syrup.⁷ We therefore suggest that the label of a diphenhydramine containing lotion should include a warning of cautious use and of possible poisoning.

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