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NIFEDIPINE IN THE TREATMENT OF ACRODYNIA*

*Şinasi Özsoylu MD***, Fikriye Sarıkayalar MD***, Avni Aksoy MD*****

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Acrodynia is a very rare syndrome seen in infants and young children, and is attributed to repeated ingestion of or contact with mercury[1]. We observed a girl with this syndrome who seemed to immediately respond to the administration of nifedipine, and we report her findings.

Case Report

An eight-and-a-half-year-old girl was admitted to the Hacettepe University Children's Hospital on May 29, 1986, because of profuse perspiration, swelling, pain, itching, desquamation of the hands and feet, and a pink color of the nose and cheeks of forty days' duration. The last twenty days she started to complain of abdominal pain. The patient and her three siblings had been exposed to mercury at home (while at play) two months ago, but only she had these complaints which were getting worse.

Physical examination revealed a child who was listless, restless, irritable, and in a state of misery. With the exception of the findings on the extremities, the pink color of the cheeks and the tip of the nose, the other findings were not contributory. The extremities were cold and clammy. She was constantly complaining of a severe burning sensation and pain in the hands and feet. In addition to the fingers, the palms and soles also appeared edematous. The blood pressure was 170/130 mmHg.

Laboratory studies revealed that with the exception of proteinuria (622 mg/sqm/day) and mild hypoalbuminemia (3.2 g/dl), liver, and kidney functions, and electrolyte and hematologic findings were within normal limits. An excretion of 25 ng/ml of mercury was detected in the patient's urine. However, greater excretions of mercury were found in the urine of her three siblings (40-97 ng/ml; control: 4 ng/ml).

Due to hypertension, intravenous nifedipine therapy was initiated in a dose of 0.2 mg/kg four times a day. The next day the pinkish color of the nose, faded and the

* From the Department of Pediatrics, Hacettepe University Faculty of Medicine, Ankara.

** Professor of Pediatrics and Hematologist, Hacettepe University Faculty of Medicine.

*** Professor of Pediatrics and Cardiologist, Hacettepe University Faculty of Medicine.

**** Pediatrician, Alanya.

pain in the extremities decreased, though the blood pressure was not considerably affected. Therefore, nifedipine (0.2 mg/kg) was administered six times a day. The patient was discharged on the ninth day of treatment, when her symptoms started to regress, the proteinuria disappeared and her blood pressure was under control (130/90 mmHg). She continued to take oral nifedipine in a dose of 0.2 mg/kg six times a day. Her blood pressure remained under control and the skin lesions improved rapidly. Within two weeks her appetite improved and she did not have any complaints, though some of the discoloration on her fingertips remained. One-and-a-half months after the initiation of treatment with nifedipine the lesions on her hands and feet completely regressed, and therefore, the dose of nifedipine was gradually decreased. Four months later the excretion of mercury in the urine was found to be normal and the drug was discontinued.

Discussion

This patient had the typical findings of acrodynia including an elevated excretion of mercury in the urine. Since her two older and one younger sibling had greater excretions of mercury in the urine than our patient, and in addition they did not present with hypertension or any of the other complaints associated with acrodynia, we believe that this syndrome is the result of an unusual reaction to mercury. However, a more widely accepted hypothesis is that acrodynia is caused by mercury poisoning[1].

Since nifedipine has been recommended in the treatment of childhood hypertension[2] and Raynaud's phenomenon in adults[3], it was therefore administered to our patient to control hypertension and skin changes most likely related to vascular processes. Although her blood pressure became somewhat lower a half an hour after every intravenous infusion, it remained generally around 140/90 mmHg for a week, though her symptoms, especially the pain, restlessness and the pinkish color of her cheeks and nose had faded considerably. As soon as her blood pressure was under control nifedipine was given in oral doses which seemed to help improve all of her findings within 50 days. Since regression of the skin lesions was observed within a few days, and the blood pressure was controlled much earlier than the normalization of mercury excretion in the urine (55 ng/ml on the 13th day of treatment) the effect of nifedipine should be symptomatic on vascular lesions but not with a decreasing mercury level. None of the side effects of nifedipine such as flushing, headache, nausea, palpitation, dizziness or syncope were observed in our patient[4]. Although we have had very favorable results with the use of sodium nitropurisside in the treatment of erythromelalgia, it was not tried in this case, because it should only be used intravenously[5,6], which requires long hospitalization due to of the chronicity of the syndrome.

Since acrodynia is an extremely rare syndrome, a control study could not be carried out. But early response to treatment evidenced by full recovery in 50 days, strongly suggests that the therapy used was effective.

It has been shown that several metal cations such as lead and cadmium are capable of abolishing the cooperativity among the two nifedipine binding sites on calmodulin which increase the apparent affinity of calmodulin for nifedipine. Mercury can compete with these potentiating, metal cations on calmodulin and produce an inactivation of this active calmodulin conformer[7]. Therefore, the effect of nifedipine in this case may have occurred by displacing mercury with the binding of calmodulin to different cells.

Summary

A case of acrodynia in an eight-and-a-half-year-old girl is presented whose symptoms–profuse perspiration, swelling, desquamation, pain, itching of the extremities, pinkish color of the nose and cheeks and hypertension–responded sharply to nifedipine therapy.

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