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Life-threatening asthma reaction caused by desensitization to milk

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Some children with IgE-mediated allergy to cow's milk proteins (CMP) develop life-long allergy that may be very severe and potentially fatal (1). Desensitization to milk is being used with good results (2), even in children with anaphylaxis (3).

A girl had presented urticaria–angioedema and vomiting with her first bottle of cow's milk formula at the age of 2 months and had positive skin prick tests to CMP. She followed a CMP-free diet since then. At 4 years of age, she developed symptoms of asthma and rhinitis and received preventive treatment with montelukast and inhaled corticosteroids, regularly adapted to the clinical course of her asthma, which was intermittent, with mild exacerbations.

Whenever accidentally exposed to small amounts of milk, she presented urticaria and vomiting. At the age of

15, her skin tests remained positive, and specific IgE was over 100 kU/l for whole milk, casein, lactalbumin, and 42 kU/l for lactoglobulin. The patient and her parents agreed to undergo an in-office desensitization procedure.

The first day she was given cow's milk diluted 1/100 in water at doses of 1, 2, 4, 8, and 16 ml at hourly intervals, with no clinical reaction. On the second day, she was due to receive 1/10 milk at doses of 1.6, 3.2, 6, and 12 ml, followed by 2.5 ml of undiluted milk.

With 6 ml of 1/10 milk, she presented transient self-limited hives in her right arm. When she received 12 ml of 1/10 milk, she developed some isolated hives in the trunk and sneezing and cough, which disappeared with a single dose of epinephrine. One hour later, she was asymptomatic and was given 2.5 ml of undiluted milk. She immediately started to sneeze and complained of difficult breathing. On auscultation she had wheezing, so she received a dose of epinephrine, with a good initial response, but after 10 min she complained again of difficult breathing and chest tightening. On auscultation, she had wheezing and hypoventilation. She received another dose of epinephrine, supplemental oxygen, intravenous hydrocortisone, and antihistamines and was put on nebulized salbutamol. She again initially improved, but after 10 min she developed very difficult breathing. The same pattern followed another dose of intramuscular epinephrine and two doses of 1/10 000 intravenous epinephrine. She was transferred to the intensive care unit, where she was sedated, intubated, and ventilated in a volume guarantee mode. She needed peak inspiratory pressures (PIP) of 50 cmH₂O; when she received intravenous epinephrine the PIP fell to 30 cmH₂O, but this

effect hardly lasted 10 min. She was put on a continuous infusion of intravenous epinephrine with stabilization of the clinical and respirator parameters; epinephrine was discontinued 6 h later, and she could be extubated. The arterial pressure remained normal and oxygen saturation over 94% all the time. The patient fully recovered with no sequels.

Desensitization has been reported to cause mild or moderate clinical reactions (2–4). Our patient had risk factors such as concomitant asthma (1) and high levels of specific IgE. We had used the same protocol in other patients with similar risk factors, with no or only very mild reactions. Thus, there must be a very close monitoring of patients during these procedures, especially in those with asthma, as most deaths of milk allergy are caused by severe unresponsive bronchospasm.

There is no first-line evidence supporting epinephrine as the treatment of choice for severe allergic reactions. A systematic review failed to identify randomized or quasi-randomized controlled trials assessing its effect (5), and probably these trials will never be conducted. In our patient, the only treatment that could revert bronchospasm was epinephrine. The effect could be evaluated while she was intubated, through the measures of PIP, so we advocate the use of as much epinephrine as needed for very severe allergic reactions.

In summary, we report the first, to our knowledge, case of near fatal asthma during desensitization to milk in a patient who would probably have died if not promptly and repeatedly treated. This calls for a more cautious use of this treatment in children with high risk.

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