

dog's milk. Prick tests results revealed a positive reactions to *Parietaria* pollens, *Dermatophagoides farinae* and *D. pteronyssinus*, dander of cat, grass, olive (+++), and to undiluted dog's milk (++++). Control prick tests with dog's milk performed in 5 healthy veterinarians were negative. We consider it important to take into account the possibility that dog's milk may be the aetiological agent of CU in veterinarians.

Key words: contact urticaria; dog's milk; occupational; veterinarians.

Occupational contact urticaria and rhinoconjunctivitis from dog's milk in a veterinarian

Contact Dermatitis 2007; 56: 169–171

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We report the case of a 46-year-old veterinarian who developed rhinoconjunctivitis and contact urticaria (CU) on his hands and forearms after contact with

Case Report

A 46-year-old veterinarian (in practice from 13 years at the time of observation) with a long-standing history of allergic rhinitis developed sneezing, nasal obstruction, and watery and itching blotches on his hands and forearms after contact with dog's milk. The onset of the symptoms occurred one year after the beginning of his work activity and recurred whenever the patient came in contact with dog's milk during surgical procedures or Caesarian section or, in general, examinations of bitches during pregnancy or false pregnancy (hysterical) or examinations of pups younger than 30 days (suckling). The symptoms regressed spontaneously after about 2 hr from exposure. He did not use gloves. The symptoms did not present after contact with dog saliva or other biological fluids (seminal fluid, etc.) or contact with cow's milk or (extremely rarely) other animals' milk (cat, bird, rabbit, hamster).

He had no dietary intolerance of dairy products made with the milks of the cow, sheep, or goat.

The symptoms disappeared when the patient began to rely on a collaborator for operations involving contact with dog's milk.

Allergological Assessment

Skin prick tests were performed with common aeroallergens, occupational allergens (epithelia of cats, dogs, rats, mice, rabbits, guinea-pigs, horses, hamsters, and goats), common foods including commercial extract of cow's milk, casein, α -lactoalbumin, and β -lactoglobulin (Lofarma, Milan, Italy), and with dog's milk. Histamine dihydrochloride 10 mg/ml was

used as a positive control. The results of prick tests were interpreted on the basis of the wheal diameter: a reaction in the same order of size as the positive histamine reference was recorded as +++, twice the size (or more) of the reference reaction as +++, half the size of the reference reaction as ++, a quarter the size of the reference reaction as +, and a negative reference reaction as -. We obtained positive prick test results to *Parietaria* pollens, *Dermatophagoides farinae* and *D. pteronyssinus*, dander of cat, grass, olive (+++), and to undiluted dog's milk (++++). Control prick tests with dog's milk performed in 5 healthy veterinarians were negative.

A specific challenge was then performed in a veterinary clinic during Caesarian section in a bitch. After 15 min from the challenge, the patient showed itchy blotches on his hands and forearms and rhinoconjunctivitis, which resolved about 4 hr after the test.

The level of total IgE (Uni-Cap, Pharmacia, Uppsala, Sweden) was 28.8 kU/l.

Assessment of the patient's serum by Uni-Cap method (Uni-Cap, Pharmacia, Uppsala, Sweden) revealed specific IgE antibodies to *Dermatophagoides*, *Parietaria judaica*, olive pollen, and grass. No specific serum IgE antibodies to cow's milk, casein, β -lactoglobulin, and α -lactalbumin could be detected.

Determination of Specific IgE to Dog's Milk

The enzyme-linked immunosorbent assay (ELISA) assay method was used to detect the presence of specific IgE antibodies to dog's milk in serum. For this 0.3 μ g/100 μ l of dog's milk (0.1 mg/ml), dog's epithelium (0.06 mg/ml), or cow's milk (0.1 mg/ml, used as negative control) in 50 mM carbonate/bicarbonate buffer, pH

9.6, were adsorbed on wells of polystyrene plates for ELISA tests by incubation at 4° Celsius for 16 hr. The wells were then washed with a buffer solution (60 mM phosphate pH 6.5 containing 0.05% Tween-20), and the free sites saturated with diluent solution (25% goat serum, 1 mM ethylenediaminetetraacetic acid, 0.05% Tween-20, 0.01% Thiomersal in 150 mM phosphate buffer pH 7.4). Equal aliquots (100 μ l) of a 1:1.5 dilution of human sera from our patient, from healthy people, and from another subject who developed rhinoconjunctivitis symptoms when exposed to dog's milk, are added to each sample and incubated at 25° Celsius for 2 hr. After 3 washing cycle, the anti-human IgE peroxidase-conjugated antiserum diluted 1:1500 in diluent buffer is added, followed by incubation at 25° Celsius for 1.5 hr. After 3 further washings, development of the colorimetric reaction was obtained by adding 100 μ l of TMB reagent (BioFX Laboratories, Owings Mills, MD, USA) and incubating for 20 min at 25° Celsius. The reaction was stopped by addition of 100 μ l of 1 N HCl and is measured at 450 nm with a spectrophotometer. In Table 1 we can observe the results of ELISA IgE. We consider as positive a sample giving an optical density (OD) value at least 3 times higher than the negative control. No significant specific IgE were present in the serum of patient neither against dog's milk nor against epithelium extract; on the contrary, the subject with allergic symptoms and considered a positive control, showed significant levels of specific IgE against both allergens (Table 1).

Discussion

Contact urticaria (CU) to cow's milk is fairly rare but well documented in

scientific literature (1,2). Such reactions are frequent in atopic subjects (3) and are usually immuno-mediated reactions associated with milk proteins such as casein and lactalbumin, whose sensitizing potential may not be modified by boiling the milk and so may oblige the patient to eliminate milk from the diet. Unusual cases of CU to endogeneous human milk proteins and to sheep's cheese have also been described (4).

We report an uncommon case of occupational CU to dog's milk in a veterinarian. Previous reports of CU of canine origin have been related to dog's saliva (6,7) and seminal fluid (8).

The diagnosis of occupational CU was made after analysis of the patient's medical history, a positive prick test to dog's milk, and a positive challenge test performed at the work place. Although we did not find specific IgE antibodies to dog's milk, we presumed that the reaction was of an allergic nature for the following reasons:

- (i) strong positive prick test results to dog's milk in the patient and negative reaction in five controls.
- (ii) the onset of symptoms after a period of one year of occupational exposure to dog's milk.

In veterinary practice, direct contact with animal milk is relatively rare, so it can be quite difficult to establish a correlation between CU and animal's milk. In view of the case we describe, we consider it important to take into account the possibility that dog's milk may be the aetiological agent of CU in veterinarians who manifest urticarious contact reactions after having examined pups younger than 30 days old or bitches in pregnancy or 'false' pregnancy, or during Caesarian section.

In conclusion, dog's milk should be added to the list of potential agents responsible for CU among veterinarians.

References

1. Boso E B, Brestel E P. Contact urticaria to cow milk. *Allergy* 1987; 42: 151-153.
2. Edwards E K Jr. Contact urticaria to cow's milk. *Cutis* 1981; 28: 450-451.
3. Oranje A P, Aarsen R S, Mulder P G, Liefwaard G. Immediate contact reactions to cow's milk and atopic

Table 1. Results of ELISA IgE test to dog's milk and to dog's epithelium in patient's serum, a positive and a negative control

Allergens	OD Values	Samples
Dog's milk	53	Patient's serum
	1445	Positive control
	31	Negative control
Dog's epithelium	40	Patient's serum
	264	Positive control
	35	Negative control

- children. *Acta Derm Venereol* 1991; 71: 263–266.
4. Makinen-Kiljunen S, Plosila M. A father's IgE-mediated contact urticaria from mother's milk. *J Allergy Clin Immunol* 2004; 113: 353–354.
 5. Munoz Martin T, de la Hoz Caballer B, Maranon Lizana F, Gonzalez Mendiola R, Prieto Montano P, Sanchez Cano M. Selective allergy to sheep's and goat's milk proteins. *Allergol Immunopathol (Madr)* 2004; 32: 39–42.
 6. Valsecchi R, Cainelli T. Contact urticaria from dog saliva. *Contact Dermatitis* 1989; 20: 62.
 7. Mancuso G, Berdondini R M. Contact urticaria from dog saliva. *Contact Dermatitis* 1992; 26: 133.
 8. Krakowiak A, Kowalczyk M, Palczynski C. Occupational contact urticaria and rhinoconjunctivitis in a veterinarian from bull terrier's seminal fluid. *Contact Dermatitis* 2004; 50: 385.

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