

CAT-PORK SYNDROME: A CASE REPORT WITH A THREE YEARS FOLLOW-UP

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SUMMARY:

A case of cat-pork syndrome with subsequent follow-up in a 17-year-old male patient is reported. At the initial observation, the patient was sensitized to cat epithelium – along with house dust mites and grass pollen – from two years. In 2001 he had an immediate reaction with urticaria, angioedema and dyspnea after eating grilled meat and sausage, and skin tests and CAP/RAST revealed a sensitization to pork meat, with a value of 4.7 KU/L for pork meat, and of 55 KU/L for cat epithelium. The patient was followed up for three years with annual repetition of diagnostic tests. The elimination of pork meat from the diet was incomplete, with slight skin reactions to small amounts of cooked pork meat but tolerance to seasoned pork products such as salami.

A challenge test with pork meat in 2004 was positive, with angioedema and asthma symptoms, and CAP/RAST showed a value of 43 KU/L for cat epithelium and 4 KU/L for pork meat. RAST inhibition confirmed the significant cross-reactivity between the two allergen sources.

These findings provide some knowledge on the natural history of the cat-pork syndrome, and confirm that very prolonged avoidance of the offending foods are needed to expect a loss of sensitization.

Cross-reactivity between inhalant and food allergens, caused by the presence in the different sources of common epitopes, is well known (1, 2). The consequent clinical syndromes may be particularly common, such as the birch-apple syndrome due to the high homology of major allergens from birch Bet v1 and from apple Mal d 1 (3) or rare. This is true for the so-called cat-pork syndrome, caused by a cross-reactivity between cat epithelia and pork meat (4), of which only a few cases are reported (5-7).

Here we describe a new case of cat-pork syndrome with evaluation of cross-reactivity by the RAST inhibition technique and followed up for three years.

MATERIAL AND METHODS

Patient

The patient was a 17 years-old male, referring to our Allergy center since 1999 for seasonal rhinitis, with an initial diagnosis of moderate/persistent rhinitis with positive skin tests for grass pollen, house dust mites and cat epithelium.

In 2001, after eating grilled meat and sausage the patient had an immediate reaction with urticaria, angioedema and dyspnea. The reaction receded in about three hours following administration of corticosteroids, oral antihistamines and inhalant β_2 -agonists. The repetition of skin tests with commercial extracts confirmed the positivity to cat epithelium and showed a positive reaction to pork meat (++), with *in vitro* confirmation by the CAP/RAST (Pharmacia, Uppsala, Sweden) technique: 55 KU/L for cat and 4.7 KU/L for pork meat. This established a diagnosis of pork-cat syndrome, with indication to eliminate from the diet all pork-derived foods. The patient was then followed up by regular annual control visits until 2005, with performance of *in vivo* and *in vitro* diagnostic tests.

Skin tests

Skin testing was performed by skin prick tests (SPT) with commercial extracts of food and inhalant allergens (Stallergenes, Antony, France) and by the prick + prick technique with raw and cooked meats

RAST inhibition

RAST inhibition was performed with commercial materials from Pharmacia by the immunoenzymatic

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method. Briefly, serial dilutions of the inhibitor extract from 1:2 to 1:16 were incubated with patient's serum, then with the solid phase of the extract to be inhibited (both extracts from Stallergenés) and to the anti-IgE tracer. Finally, the samples were loaded to ImmunoCAP™ and run. A reference extract to established levels for 100% inhibition was used, performing linear regression on the data between 10 and 90% inhibition, for reference and sample extracts. Comparing the slopes of the lines, which represent the degree of similarity between the extracts, the difference between the lines in vertical intercept (concentration) at 50% inhibition level, which is the relative allergenic potency, was calculated.

RESULTS

In 2002 the repetition of CAP/RAST showed a decrease of levels of specific IgE, which corresponded to 40 KU/L for cat epithelium and to 4.5 KU/L for pork meat. Skin tests for

raw and cooked meats by the prick by prick technique gave the results reported in table 1.

The SPT to the commercial extract of pork meat confirmed the ++ positivity.

In 2003 the CAP/ RAST was 23.9KU/L for cat epithelium and 1.95 KU/L for pork meat

Kind of meat	Raw	Cooked
Horse	+++	+
Rabbit	++	Negative
Cow	++	Negative
Lamb	++	Negative
Chicken	Negative	Negative
Turkey	Negative	Negative
Pork	++++	+

Table 1: Results of prick + prick with raw and cooked meats.

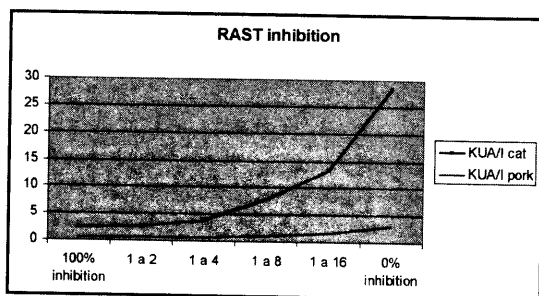


Figure 1: Prevalence of atopy in the three age groups.

In 2004 the CAP/RAST was 43 KU/L for cat epithelium and 4 KU/L for pork meat. The patient reported to have eaten small amounts of pork meat with slight skin reactions, but with no reactions to seasoned pork products such as salami.

For safety reasons, an open challenge with cooked pork meat was performed with development of angioedema and asthma symptoms. The need to avoid pork meat was confirmed to the patient.

In 2005 the *in vitro* evaluation was extended to RAST inhibition, which showed an inhibition of the CAP/RAST of cat epithelium by the pork meat extract (figure 1).

DISCUSSION AND CONCLUSIONS

A series of studies conducted by the group of Sabbah demonstrated that the cat-pork syndrome is caused by the sharing of an homologous protein, namely a serum albumin of 67 kD, in cat and pork (4-6). However, such protein is not present in seasoned pork meat and products, and this accounts for the tolerance to these foods in our patient. By contrast, the sensitization to the major allergen from cat Fel d1 is characteristic of patients with exclusive allergy to cat (5).

The sensitization to the cross-reactive serum albumin underlying the cat-pork syndrome is rare, considering the few cases reported thus far, but may be very dangerous, as indicated by a fatal anaphylaxis to boar meat (pork and boar are strictly related, belonging to the same family of *Suidae*). A suitable method to assess this possibility may be to test the most common meats by RAST technique or skin tests, with an advantage for the latter regarding the variety of meats when the prick + prick method is used.

On the other hand, a positive prick tests does not necessarily indicate clinical sensitization: our patient show a positive test (at least to raw meat) also to horse, lamb, cow, and rabbit, which were not associated to allergic reactions.

Still, the main remark of this report is the observation by a three years follow-up of the natural history of allergy to pork meat. Generally, clinical tolerance develops to most food allergens over time, but a complete avoidance is needed to achieve such an outcome (8). In fact, allergy to peanut, which may result very difficult to avoid entirely, shows a different natural history, characterized by a prolonged persistence of sensitization (8). Our data suggest that three years of incomplete avoi-

dance are insufficient to obtain a loss of sensitization, and therefore patients allergic to pork must be advised to keep away even from small amounts of such food.

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