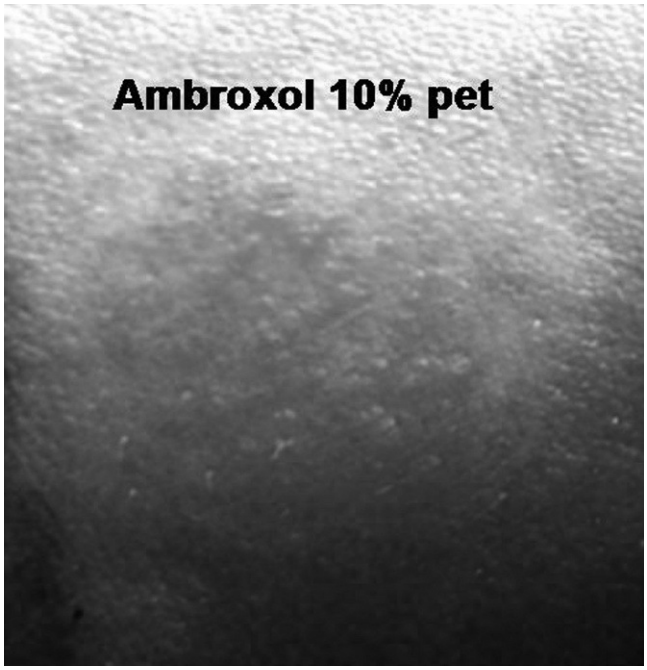

Figure 2. Patch test with ambroxol (10%pet) positive at 96 h (+++).

cal trials for the prevention of chronic bronchitis and respiratory distress syndrome in infant.

A 79-year-old woman presented a maculopapular rash with intense pruritus. She had taken ambroxol, acetaminophen, and codeine for 4 days at doses of 90 mg/day, 1,500 mg/day and 90 mg/day respectively, prescribed for odynophagia. On clinical examination there was a generalised maculopapular exanthematous eruption, with furfuraceous desquamation and intense erythema. The mucosa was spared. She was treated with hydratation, antihistamines, and oral corticosteroids and the skin lesions resolved within a week. After this episode the patient tolerated acetaminophen and acetylsalicylic acid. She had no personal and familiar history of atopic diseases.

Patch tests were performed, according to the guidelines of the International Contact Dermatitis Research Group, with the GEIDC standard series, ambroxol (10%pet) and codeine (10%pet).

Positive reaction was found to ambroxol at 48 hours (++) which increased at 96 (+++) (Fig. 2), and negative to codeine and the standard series. Patch tests were negative in 10 controls. The oral challenge was not carried out for ethical reasons.

Delayed reactions to systemic drugs are not rare and patch test is a well-known method for diagnostic confirmation purposed in patients with generalised type IV hypersensitivity reactions.[1,2] We report a systemic contact dermatitis due to ambroxol, presented as a maculopapular rash and confirmed by patch testing.

Systemic cutaneous reactions by immediate hypersensitivity have been described during the treatment with ambroxol such as urticaria. Delayed reactions to ambroxol such as non-pigmented fixed erythema[3] and contact sensitivity to ambroxol have also been reported when administered by aerosol,[4] but as far as we know, this is the first case of systemic generalised dermatitis caused when taken orally.

Exanthema induced by bromexine has been reported[5] and despite the chemical structures being very similar, the absence of cross-reactivity between them has been demonstrated in one case.[4] More studies should be reported to as certain it definitely. We did not perform an oral challenge with bromexine because of the possibility of inducing a severe reaction, and because it was not an essential drug for the patient.

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Severe allergy to poultry meat without sensitisation to egg proteins with concomitant Leguminosae allergy. Case report

To the Editor:

The number of known animal food allergens is limited. Although chicken meat is quite a common part of European diet and hen's egg is one of he most frequent allergens in children, severe poultry meat allergy without sensitisation to egg proteins is extremely rare.[1-3] Allergy to turkey and duck meat is even more rarely reported and the implicated allergens are poorly characterised.[2-4] In the bird-egg syndrome, sensitisation to chicken feather allergen occurs by the respiratory route and afterwards allergy symptoms appear due to bird meat consumption. The implicated allergen is thought to be alpha-livetin.[2] We report a clinical case of severe chicken and turkey meat allergy without sensitisation to egg proteins. There was also coexisting Leguminosae allergy.

The particular interest of this case is the need for liver transplantation and use of immunosuppressive therapy in the patient with familial amyloid neuropathy.

Solid organ transplantation with the use of calcineurine inhibitors, especially tacrolimus, is a risk factor for new food allergies and probably for aggravation of the pre-existing food allergy.[5] For this reason, careful elimination diet and immunosuppression with alternative drugs are very important in the post-operative period.

A 31-year-old Caucasian man, with a diagnosis of familial amyloid neuropathy, proposed for liver transplantation, was referred to our Immunoallergology Department for investigation of food allergy.

At the age of 21 and 23, he experienced generalised pruriginous erythema, laryngeal tightness and sialorrhoea immediately after ingestion of cooked red beans, white beans and black-eyed beans. At the age of 29, the patient developed generalised itch, palmar erythema, laryngeal tightness and dysphagia after ingestion of grilled chicken meat. One year later, he had a similar episode with ingestion of grilled turkey meat and oropharyngeal pruritus and sialorrhoea with ingestion of duck meat.

Following that, the patient eliminated all poultry meat and every type of beans from his diet. He had never had any complaints after ingestion of other legumes (namely soy), tree nuts and cooked or fresh eggs and had not previously ingested goose, pheasant and/or grouse meat.

The patient had symptoms of recurrent nasal obstruction from the age of 20 without seasonal aggravation. There was no contact with birds in the domestic environment and no history of eczema, asthma or drug allergies.

Skin prick tests (SPT) were performed with plastic Morrow-Brown needle (Stallerpoint®, Stallargenes) with extracts of the most common inhalant allergens and commercially available extracts of food allergens in a 0.5%phenolated solution and 50%glycerine (Bial-Aristegui®, Bilbao, Spain). Saline was used as a negative control and 10 mg/mL histamine phosphate as a positive control.

The SPT results were evaluated after fifteen minutes and reactions were considered positive if the largest wheal diameter was 3 mm over the negative control.

Cooked and raw chicken, turkey and duck meat, cooked and raw red and black-eyed beans were tested by prick-to-prick tests.

Serum total and specific IgE were determined by enzyme-immunoassay following the manufacturer's instructions (UniCAP®, Phadia, Uppsala, Sweden). Inhibition study was performed using RAST technique (UniCAP®, Phadia, Uppsala, Sweden) and results were expressed as percentage inhibition. Sodium dodecylsulphate-polyacrylamide gel electrophoresis (SDS-PAGE) Immunoblotting was carried out according to the method of Laemmli.[6]

Skin and serological test results are shown in Table I.

Food challenge was not performed due to the underlying disease and because of the clear clinical data with reproducible symptoms.

RAST inhibition study between rye-grass pollen and bean was positive (91%); the inverse study was negative.

SDS-PAGE Immunoblotting (Fig. 1) showed IgE binding bands of 27, 42 and 70 kDa in both, chicken and turkey raw meat extracts. Regarding turkey meat there was an intense fixation band in the 55 kDa region. The assay with bean extract demonstrated binding bands of 31 kDa.

The patient was instructed about the elimination diet (avoidance of all avian meat, beans, pea and chickpea) and the use of intramuscular adrenaline Kit. He was submitted to a liver transplantation with a use of cyclosporine as immunosuppressive drug without any complications during one year of follow-up.

Patients with so-called "bird-egg" syndrome exhibit cutaneous and respiratory symptoms after ingestion of egg-yolk and/or inhalation of feathers. In the majority of cases the allergen involved is alpha-livetin (chicken serum albumin) and sensitisation occurs by respiratory route.[2] Allergy to poultry meat is rare and the implicated proteins are poorly characterised.

We describe a rare case of severe chicken and turkey meat allergy and oral allergy syndrome after ingestion of duck meat. The patient had no sensitisation to egg proteins. IgE-mediated mechanism was confirmed by skin prick, prick-to-prick tests and serum specific IgE measurements.

According to the published results, patients with bird-egg syndrome have specific IgE antibodies against a 70-kDa protein of egg yolk, whereas those who suffer from chicken meat allergy but no feathers or egg allergy show IgE antibodies against several lower molecular weight proteins of chicken meat.[3,4] Our IgE-Immunoblotting study revealed proteins of 27 and 42 kDa with both chicken and turkey meat[2-4]. A protein of 55 kDa was only found with the turkey meat extract, a protein with a similar molecular mass was previously reported by Cahen et al.[2] Although IgE binding has been described at 70 kDa-band in studies with both chicken and turkey meat extracts, this binding was weaker than with sera from patients with bird-egg syndrome.[4]

The results of electrophoresis of various avian meats performed by Kelso et al. showed that duck meat has binding bands (8 kDa, 16 kDa) different from chicken, turkey and goose meat. This fact can probably explain milder symptoms of our patient in exposure to duck meat with negative skin prick-to-prick test results and negative specific IgE measurement.

Legumes are dicotyledonous plants belonging to the Fabales order. This botanical order is formed by three families: *Mimosaceae*, *Caesalpiniaceae* and *Papilionaceae*. Bean (*Phaseolus vulgaris*), chickpea (*Cicer arietinum*) and pea (*Pisum sativum*) belong to the *Papilionaceae* family.[7] Our patient had anaphylaxis after ingestion of red, white, and black-eyed bean, positive tests with pea and chickpea commercial extracts and elevated specific IgE to chickpea.

According to previously published results in Mediterranean population, about 80%of patients allergic to legumes had sensitisation to pollen; pea and bean were the legumes with more *in vitro* cross reactivity with *Lolium perenne*.[7]

Our RAST inhibition studies with rye-grass pollen and bean extracts showed the existence of cross-reactivity between both allergenic sources and the initial respiratory sensitisation to grass pollen. In the report of Ibanez et al., there was cross-reactivity between pea (*Pisum sativum*) and bean (*Phaseolus vulgaris*) in about 23%of the patients studied.[7]

To our knowledge, there are no reports of cross-reactivity between bean and chickpea (*Cicer arietinum*). SDS-PAGE Immunoblotting performed with bean extract revealed implicated protein of 31 kDa. The protein with similar molecular weight (30 kDa) was previously described for soy (*Glycine max*).[8]

Our patient had no complaints with soy ingestion and had negative skin and serological test results for soy.

The cross-reactive allergens of Leguminosae family are poorly characterised and the risk of cross-reactivity is hard

Table I. Skin and serological test results

Commercial allergens	SPT, mm	sIgE, kU/L	Commercial allergens	SPT, mm	sIgE, kU/L
Negative control	0	—	*Plantago lanceolatum*	5.5	0.73
Positive control	5.5	—	*Artemisia*	6.0	0.32
Dermatophagoides pteronyssinus	8.5	3.1	*Parietaria judaica*	0	NP
Dermatophagoides farinae	7.5	2.0	Latex	0	NP
Acarus siro	0	NP	Feathers mix	0	0
Blomia tropicalis	0	NP	Egg white	0	0
Euroglyphus maynei	0	NP	Egg yolk	0	0
Lepidogyphus destructor	0	NP	Ovomucoid	0	0
Alternaria alternata	0	NP	Ovalbumin	0	0
Asperillus fumigatus	0	NP	Lentil	0	0
Cladosporium	0	NP	Chickpea	7.0	0.31
Mucor	0	NP	Pea	6.0	0.24
Penicillium	0	NP	Peanut	0	NP
Candida albicans	0	NP	Soybean	0	NP
Trichophyton rubrum	0	NP	Broad bean	0	NP
Grass pollen mix	6.5		Green bean	0	NP
Lolium perenne	7.5	3.52	White bean	5.5	0.20
Phleum pratense	6.5	3.2	Chicken meat	6.0	0.43
Olea europea	7.5	0.84	Turkey meat	0	0.14
Betula	0	NP	Duck meat	0	0

Native food	PPT, mm	Native food	PPT, mm
Chicken meat (cooked)	9.5	Duck meat (cooked)	0
Chicken meat (raw)	8.0	Red bean (raw)	0
Turkey meat (raw)	9.5	Red bean (cooked)	0
Turkey meat (cooked)	9.0	Black-eyed bean (raw)	0
Duck meat (raw)	0	Black-eyed bean (cooked)	0

SPT: Skin Prick Test, mean diameter of the wheal; sIgE, serum specific IgE; NP: not performed; PPT: prick-to-prick test, mean.

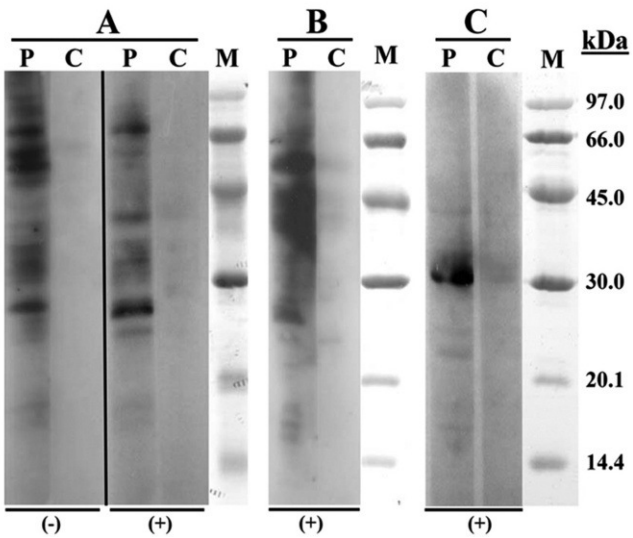

Figure 1. Sodium dodecylsulfate-polyacrylamide gel electrophoresis results. A) Chicken meat extract; B) Turkey meat extract; C) Bean extract. P: patient serum; C: control serum (pool of serum from non-atopic subjects); M: molecular weight marker.

to predict, in any case elimination diet is recommended only for foods with positive clinical data or oral provocation tests. We suggested elimination of beans because of clear clinical data and laboratory results. Pea and chickpea elimination was suggested because of sensitisation, documented by skin prick-to-prick tests in the patient with elevated food allergy risk.

When a patient has allergy to hen's meat without sensitization to hen's egg, the risk of cross-reactivity with other types of poultry meat is increased[3]. This fact was the reason for a very restrictive diet with elimination of all poultry meat.

It is well recognized that immediate-type hypersensitivity and life threatening food allergy may arise post-liver transplantation in patients treated with tacrolimus and it has been suggested that those at greater risk are patients with a personal history of atopy[5]. The mechanism of this phenomenon is poorly understood. Tacrolimus increases intestinal permeability and probably also antigen transport across gastrointestinal epithelium. Besides, as other calcineurin inhibitors, tacrolimus was associated with suppression of interleukin-2 and interferon-gamma, having no effect on IL-4 and IL-10 (Th2 cytokines). Cyclosporin is significantly less potent than tacrolimus, so the current recommenda-

tions for cases with high risk of food allergy after solid organ transplantation involve dietary manipulations —elimination diet and replacement of tacrolimus by cyclosporine[5]. In this particular case we suggested cyclosporine therapy and a rigorous elimination diet with avoidance of all poultry meat and Leguminosae. The patient had no complications and has been asymptomatic during one year of follow-up.

We describe a rare case of an adult with allergic rhinitis who had serious allergic reactions to various beans and poultry (chicken and turkey). The complexity was increased due to the need for immune suppression for liver transplantation.

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Allergic Rhinitis and Childhood Sleep Disordered Breathing

To The Editor:

Paediatric allergic rhinitis is one of the most common chronic illnesses of childhood. It is typically characterized by sneezing, pruritis, rhinorrhea and congestion. Even mild allergic rhinitis impacts all aspects of sleep, most prominently when uncontrolled. This case illustrates that uncontrolled allergic rhinitis can result in insomnia in a school age child.

Case Report: The patient is a 10 year old Hispanic male with a history of allergic rhinitis (AR) and specific IgE responses to grass, trees and dust mites documented by skin testing. He was well controlled with daily montelukast, and as needed, cetirizine and inhaled nasal corticosteroids. Currently, his mother stopped the montelukast and other medications, after hearing a news report that there were behavioural side effects associated with the montelukast. At the time she stopped the medications, there were no symptoms, changes in sleep or behaviour.

One month later, his sleep pattern dramatically changed. His sleep latency changed from ten minutes to two hours according to his history. Once asleep, he had two to three nocturnal awakenings. There was no associated snoring, nightmares, night terrors or daytime somnolence. His mother denied any changes in social, school or family history. He does not drink caffeinated beverages and has had no recent illness. His current symptoms also include frequent rhinitis, congestion and itchy eyes.

Environmental history: They have no pets or smokers at home. The family uses dust avoidance measures.

His past medical history is notable for normal spirometry, removal of tonsils and adenoids, for habitual snoring and enlarged tonsils in 2006. One nasal polyp was removed at the same time. No sleep study was performed. At the age of 15 months, he had one episode of cold symptoms and wheezing, which was relieved with albuterol. *Family Medical History:* notable for asthma in one parent. *Review of Systems:* He participates in soccer without dyspnoea or cough. His school performance is very good and has not changed since being off montelukast treatment. Notable findings on physical examination include a body mass index of 19. His ear, nose and throat exam revealed boggy pale nasal turbinates and clear nasal discharge. The remainder of his exam was normal. The patient was restarted on inhaled nasal corticosteroids and a second generation antihistamine with complete resolution of his symptoms.

Allergic Rhinitis is one of the most common chronic conditions among children. The disease is associated with both mechanical and inflammatory molecular mechanisms of sleep disordered breathing (SDB).[1] The case report illustrates that while the treatment of AR can contribute to SDB, the lack of treatment also can cause SDB.

Inflammatory cytokines are released as part of the allergic response, and in turn have been associated with suppression of both rapid eye movement (REM) and non-REM sleep. In particular, IL-1, IL-4 and SP can cause increased latency to REM.[2] Nasal challenges with Substance P can increase nasal airway resistance and latency to REM.[3] The patient described was well controlled with montelukast, a leukotriene antagonist. Leukotrienes as key allergic mediators increase vascular permeability, mucus secretion and nasal obstruction. Nasal congestion is directly linked to sleep quality. Nasal congestion caused a 1.8 fold increase in moderate to severe sleep-disordered breathing compared to subjects without this symptom. The peak congestive hours are in the early morning, correlating with enhanced effect on sleep. In studies, mean nasal congestion peaked at 5:00 AM and was associated with a 20% increase in overall symptom intensity.[4]