

All these data underline the close link among allergic inflammation, AR, and asthma. Thus, this study might suggest that a FeNO value >34 p.p.b., such as pathological, may predict future asthma onset with good reliability in AR children.

Therefore, all these previous studies were consistent with the present report, confirming the role of FeNO as marker of bronchial impairment. On the contrary, lung function assessment was not able to predict asthma onset in all children, also those with high FeNO values. This fact highlights the possible capability of FeNO as potential candidate of predictive marker for asthma onset in AR patients.

However, this study has a main limitation, such as the restricted number of children, who were enrolled.

In conclusion, this study provides a preliminary evidence that FeNO may predict with fair capability the risk of asthma onset in children with AR alone. Therefore, a simple FeNO measurement could suggest relevant information about possible bronchial involvement in AR.

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Psychological care of food-allergic children and their families: an exploratory analysis

To the Editor,

Food allergy is demonstrated to be a burden for young patients and their families, affecting general, mental health and quality of life (QoL) (1–4). Food allergy significantly influences stress and anxiety levels, and impacts on family daily and social life (2, 5, 6).

Adolescents are more inclined to risk-taking behaviours that put them at risk for fatal allergic reactions. Even if they describe living with food allergy as a way of life, they find it burdensome and they tend to feel frustrated because of their disease (7, 8).

Anaphylaxis represents a particular source of anxiety and stress for patients and caregivers (6, 8, 9). In most cases, the high levels of anxiety decrease and a more adaptive high level of vigilance prevails. In some cases, an excessive level of anxiety lasts and grows into maladaptive or psychopathologic anxiety. Healthcare providers must be aware of the psychological challenges these families face and know when to encourage families to seek psycho-educational guidance (1). There are

only few data on the psychological care of food-allergic children and their families, although consistent evidences are now available on the impact of food allergy on well-being and mental health, as well as on the convenience of improving QoL and reducing distress among these patients. This study aimed to investigate psychological treatments offered to food-allergic children and their families assessing patients' main characteristics, reasons for seeking psychological support, type and timing of treatments and patients' perception of the effectiveness of the intervention.

One hundred psychological treatments held at a Food Allergy Referral Centre (FARC) in the Veneto Region (North-eastern Italy) were selected consecutively. All treatments were held by a psychologist psychotherapist specialized in clinical psychology and with expertise in food allergy, working at the centre. Psychological healthcare service at the centre is exclusively dedicated to food-allergic patients and their relatives to support the psychosocial burden of food allergy. All food-allergic patients received the diagnosis by an allergist on the

Table 1 Assessment of patients' perception of the intervention effectiveness (N = 100)

	Much worse	A bit worse	About the same	A bit better	Much better
How are your problems after the intervention?	0	0	0	67%	33%
Has the intervention helped in other ways, for example providing information or making the problems more bearable?		Not at all 0	Only a little 2%	Quite a lot 49%	A great deal 49%

basis of clinical history, positive skin prick test, *in vitro*-specific IgE and positive food challenge. Data were collected from hospital records. A descriptive statistical analysis was performed to assess typology of patients, reasons for seeking psychological support, type and timing of treatments and patients' perception of effectiveness.

The reasons why patients asked for psychological support were analysed and assigned to four main categories: emotional/social problems, difficulties in managing food allergy, eating problems and behavioural problems.

Patients' perception of the effectiveness of treatments was measured through an adaptation of the additional follow-up questions of the Strengths and Difficulties Questionnaire of Goodman for use after an intervention (available at <http://www.sdqinfo.com/>) as shown in Table 1. The study was performed in accordance with the Italian regulation regarding potential sensitive data and according to World Medical Association Declaration of Helsinki Ethical Principles for Medical Research Involving Human Subjects. Parents and patients of age signed an informed consent. Authors intentionally avoided reporting detailed information about patients to guarantee anonymity and confidentiality.

On the whole sample, 25% of treatments were addressed to food-allergic children from 5 to 12 yr of age, 36% to teenagers (13–19 yr), 26% to the whole family of the food-allergic patient, 9% to mothers, 2% to fathers and 2% to siblings. Totally, 51% of treatments were addressed to males.

Focusing on the reason why patients asked for psychological support, 40% of treatments were required mainly because of emotional/social problems including anxiety, stress and mood disorders, internalizing problems such as excessive worry and/or fear, loneliness, social isolation and poor self-esteem. Moreover, 40% of treatments were sought because of difficulties in managing food allergy that included inadequate or maladaptive coping strategies in managing diet and/or treatment. Furthermore, 18% were requested because of eating problems such as monotonous or excessively restricted diet, difficulties in introducing or re-introducing foods, excessive diffidence and fear towards food. Finally, 2% of treatments were sought because of behavioural problems including oppositional behaviours. Interestingly, 25% of treatments were sought as a consequence of an anaphylactic reaction.

On the whole sample, 56% sought psychological care spontaneously, while 36% did it on the basis of clinician's suggestion (allergist, paediatrician or dietitian), and 8% were addressed by National Food-Allergic Patient Organization. With regard to type and timing of treatments, 76% was

individual consultation and 24% group activity; 8% of treatments consisted of psychotherapy, 31% counselling and 61% psychological support; 4% of treatments were long-term (more than 24 sessions), 19% midterm (from 11 to 24 sessions) and 82% brief therapy (up to 10 sessions). Data on patients' perception of the effectiveness of the intervention are shown in Table 1.

The majority of treatments in our sample were addressed to adolescents: this is in line with literature showing that this group of age is challenging with regard to psychosocial management of food allergy. Teenagers demonstrated risk-taking behaviours in the management of their food allergies (8). The continual work of vigilance and decision-making was described as time-consuming and frustrating. They reported a sense of insecurity, as well as feelings of being disregarded and misunderstood by others. (7). DunnGalvin and colleagues (10) found that following the transition point of 8 yr, children begin to speak about how 'being different' has psychosocial consequences. In food-allergic patients, the normal developmental process of achieving personal autonomy takes place against a backdrop of anxiety for both children and parents. Results from the present study showed that a considerable number of treatments were addressed to the whole family. The family can be considered as an entity that has to accommodate the requirements imposed by food allergy such as reading labels, adapting recipes, managing allergen avoidance and possible reactions. It is recommended that the experience of allergy should be viewed in the wider family context with specific consideration given to parental coping and anxiety (1, 9, 11). A number of treatments were addressed to parents, mostly mothers, and also to siblings. Mothers reported worse psychological and physical QoL than fathers and had higher scores for anxiety and stress (2, 6). No data are available about the psychological burden of food allergy in siblings, although it was stated that they might become resentful of the extra attention given to the allergic child or become fearful that the allergic brother or sister will have another reaction and die (11).

Based on findings, patients asked psychological care mostly for emotional/social problems and difficulties in managing food allergy. Food-allergic patients and families were found at risk of emotional and psychosocial consequences (1, 2, 6, 8). Food allergies may impact emotions through both direct and indirect mechanisms. Direct mechanisms include the effects on the central nervous system from biologic mediators released during allergic reactions. Indirect mechanisms include the stress of coping with food allergy as well as managing the fear of the potential consequences of food ingestion. Indirect effects

may also be mediated through family members such as the impact of parents' stress on the child (4). Moreover, food allergy impacts on approach to social life (5) and may sometimes even result in bullying (12).

With regard to problems in managing food allergy, avoidance of the implicated food requires families and patients to determinate suitable approaches to best manage food allergies, varying as the child age or as the situation changes (5, 11). A small but substantial proportion of families experience significant psychological distress and/or maladaptive coping responses that interfere with the child's psychological and social development and family's optimal functioning (1). Young people are at a disproportionately increased risk of anaphylaxis deaths for reasons that include a failure to institute appropriate long-term management regimens. Checking food labels, eating out and deciding whether or not to carry the adrenaline autoinjector have been identified as critical for adolescents. Some of them showed inadequate knowledge of potentially dangerous situations and concrete strategies to manage their condition in a safe and responsible way as well as an inappropriate overconfidence and minimization of the risk (7, 8). On the other hand, high levels of anxiety, vigilance and generalized avoidance of situations and people not directly related to food consumption were also associated with maladaptive strategies (1, 10).

Regarding 18% of treatments, asked because of eating problems, a previous study reported low interest in tasting new foods and monotonous or excessively restricted diet among food-allergic children (5). Young patients who have experienced a severe reaction sometimes develop disordered eating or become withdrawn and fearful (11). Only talking about food can generate anxiety in these patients and is often associated with physical reactions and illness (10).

Interestingly, a quarter of treatment was sought in consequence of an anaphylactic reaction. Having a child with anaphylaxis can have a significant long-term psychological impact on parents, and this anxiety may in some cases be transferred from parents onto their children (8). Anaphylaxis is a distressing and potentially fatal event; people may develop stress disorders and psychiatric comorbidity symptoms after experiencing anaphylaxis, which then impacted the way they coped with food allergy. The physical, cognitive and behavioural aspects of anxiety that may be associated with anaphylactic risk must be addressed to ensure optimal psychological as well as medical outcomes (9).

A quarter of the analysed treatments consist of group activity such as group therapy or psycho-education: this type of intervention is particularly recommended for teenagers and parents (1, 9) as it reassures patients that their concerns are shared by other people, promotes new and more adaptive coping strategies through discussion and comparison among participants and facilitate socialization.

Based on the results, the majority of patients needed psychological support including cognitive behavioural treatment,

relaxation treatment and psycho-educational interventions to facilitate more adaptive approaches (emotional, behavioural, cognitive and social) in managing food allergy and anaphylaxis, to allow patients to express feelings in a safe environment, to alleviate feelings of distress and prevent psychopathological risk. A number of treatments consisted in counselling intervention mainly focused on improving patients' awareness of their difficulties and strengths in dealing with food allergy, offering positive models and promoting QoL. Only a small number of patients required psychotherapy for more structured psychological symptoms and mental health problems.

It is worth to note that all patients reported at the end of their treatment an improvement of their situation and evaluated the intervention as helpful.

This first exploratory analysis presents a number of shortcomings that have to be acknowledged. The investigation is very descriptive in its nature, although it first offers a picture of psychological care of food-allergic children, teenagers and families, comparing clinical data from a FARC to literature data on psychological burden of food allergy. Effectiveness of the intervention was measured only through a brief patients' self-report; further studies should use more specific and comprehensive instruments, as well as long-term evaluations. Because of the relative small size and variety of the sample, it was not possible to compare different types of patients and treatments; however, it would be useful to investigate what kind of intervention is more effective and for which type of patient or problem.

Children, teenagers and families may have a variety of unique psychosocial needs related to adequate coping with food allergy. Although many patients with food allergy function well, a certain subset of children and families may require guidance, support or psychotherapy to reach a positive, balanced adaptation to food allergy. Allergists are in an important position to recognize food-allergic patients' and families' needs for psychological care. When excessive distress or anxiety, social problems and/or maladaptive coping are a concern, clinicians should consider referral to a psychologist or suggest the use of an integrated centre offering focused psychological treatments (1, 4). As recently recommended by EAACI, facilitated access to psychological interventions as well as coordination among healthcare professionals should be ideally put in place for the effective treatment of food-allergic patients (3).

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Endoscopic findings in the acute phase of food protein-induced enterocolitis syndromae

To the Editor,

A gastrointestinal (GI) allergy is defined as hypersensitivity reaction of the digestive system after the ingestion of certain foods or drugs. The mildest condition is food protein-induced proctocolitis (FPIPC), which presents as small and fresh rectal bleeding and mucosal edema or erosion of the rectum [1]. The diagnostic guideline for FPIPC includes Odze's pathological criteria: eosinophil infiltration in the colonic lamina propria of ≥ 60 cells/10 high power field (HPF) [2]. However, endoscopic findings in the acute phase of food protein-induced enterocolitis syndrome (FPIES) have not been well documented. We present the first case of a patient with FPIES accompanied by severe diarrhea and hypovolemic shock who underwent sigmoidoscopy on the day of the disease onset.

A girl born on the 36th week of gestation (2350 g) was only fed maternal breast milk. She developed rectal bleeding at 41 days old. As her bowel movements gradually increased, she was seen by a primary care physician. She did not have an ill appearance or weight loss; thus, she received no treatment. However, she gradually developed poor sucking, diarrhea, and body weight loss. She was admitted to the pediatric department of a regional hospital at 56 days after birth. The laboratory data showed an elevated C-reactive protein (CRP) level. A sepsis work-up was performed, and fluid therapy and antibiotic treatment were started. As sepsis due to bacterial transmission from mastitis through breastfeeding was suspected, the patient's mother was instructed to stop breastfeeding and to start bottle-feeding with a cow's milk formula. On the following day, the diarrhea and dehydration worsened, after which hypovolemic shock and seizure started, and she was transferred to our hospital.

Upon admission, she was hypovolemic and acidotic, and she passed whitish watery stool every 10 min. Her white blood cell

count was elevated ($53.6 \times 10^9/l$), CRP level was 8.65 mg/dl, and procalcitonin level was 2.27 ng/ml. There was no peripheral eosinophilia. She required an intravenous fluid infusion (170 ml/kg every 7 h) and a calcium gluconate infusion for hyperkalemia (9.4 mEq/l).

After 3 h of treatment, her vital signs became stable, and sigmoidoscopy without sedation was performed to evaluate the cause of severe diarrhea. The endoscopic findings showed edema and loss of the vascular pattern of the mucosa (Fig. 1). However, erosion and ulcers were not evident. The histopathologic findings from a biopsy specimen of the rectum showed a marked crypt abscess and crypt distortion, which resembled those in ulcerative colitis. Eosinophil infiltration was not observed. Her stool was negative for eosinophils, which was consistent with these findings. Instead, mast cells, which were positive for c-kit immunostaining, were markedly increased (50/HPF) (Fig. 2b). As the blood culture was negative, we suspected that the symptoms were due to FPIES. A lymphocyte stimulation test (LST) against the cow's milk protein showed positive values (stimulation index [SI]: 2.6), and a skin prick testing to the cow's milk also showed a positive result. The patient's serum histamine level increased to 2.58 ng/ml (normal range: 0.15–1.23 ng/ml) upon admission, and her total IgE level was 169.2 IU/l (normal range: <20 IU/l); however, the specific IgEs against the cow's milk, alpha-lactalbumin, beta-lactoglobulin, and casein were negative. The serum cytokine profiles showed a marked elevation of interleukin (IL)-1 beta, IL-6, IL-8, and the tumor necrosis factor (TNF)-alpha, all of which were normalized within 2 weeks after treatment. The IL-4, 5, and 12 were not increased on admission or after treatment. Enteral nutrition with extensively hydrolyzed casein formula was started on the 12th day post-admission without further symptoms.