

Alimentary allergy and Ultrasonography: facts and fantasies

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Abstract:

The international guidelines about food intolerances, allergy and immunity provide for rigorous steps in which ultrasonography is not provided. However there is evidence in literature about an ancillary role of ultrasonography in these conditions.

In this report we analyze the main pathologies with allergic or immune pathogenesis

Key words: Ultrasound – food allergy- Intolerance -

Introduction:

Ultrasonography (US) represents the first-choice diagnostic tool in the setting of the most relevant abdominal pathologies, however his role remain unclear and controversial in the diagnosis of allergic or immunologic disorders of the gastrointestinal tract. In fact, it is difficult to imagine how a morphological investigation could be of help in functional disorders.

However in the literature there are numerous studies that highlight a role, albeit ancillary, to US in the evaluation of these disorders. In this review we analyze the ultrasound findings of the main pathologies food-related

Hypertrophic pyloric stenosis.

The hypertrophic pyloric stenosis (HPS) is a condition characterized by progressive hypertrophy of the smooth muscle of the pylorus. This hypertrophy leads to worsening vomiting with

metabolic alkalosis and dehydration with the need for surgery. The US scan play a relevant role in the diagnosis of HPS: diagnostic criteria for PS included muscle thickness equal to or greater than 4 mm, length equal to or greater than 18 mm, and/or limited flow of fluid through the pyloric channel (Fig 1)(1) . Us was performed with patient in supine position or in oblique right position, by mean of a linear 7,5- 12 MHz probe. US had a 100% sensitivity and 100% specificity for HPS: thickness of 3 mm or higher was 100% sensitive and 99% specific for HPS, and pyloric lenght of 15 mm or higher was 100% sensitive and 97% specific (2). Another signs is increased vascularity at color-Doppler examination (3).

However, some conditions mimic hypertrophic stenosis: since 1972 a correlation between HPS and allergy has been hypothesized (4) and in 1978 another report was reported (5). A case of foveole hyperplasia presenting with clinical symptoms of HPS has been reported (6). Indeed there is a recent report about eosinophilic gastroenteritis mimicking HPS (7). The eosinophilic gastroenteritis is part of the pathologies in which food awareness can be demonstrated. As a final consideration we report a study in which authors observe the high incidence of HPS in patients undergoing gastrointestinal surgery (8): HPS: cause or effect of allergy?

Cow's milk allergy:

Cow's milk protein (CMP) allergy is a condition frequently encountered in the first 36 months of life and 2-3% of children are believed to have this condition (9). The diagnosis is based on clinical criteria, remission of symptoms on a milk protein-free diet and recovery of symptoms with the reintroduction of milk proteins (10). Numerous studies have been conducted regarding the correlation between allergy and US (11, 12, 13).. The patient was in supine position, and examination was performed by mean of 7,5 -12 MHz probe. The following parameters were considered: wall thickness of ileum and colon, defined as normal if the thicknesses is higher of 3

mm and 4 mm, respectively. The thickness was measured by placing the pointer between the mucosal surface and the serosa in the same bowel loop. Another sign considered is vessel density, evaluated at color-Doppler examination. In conclusion Doppler ultrasonography and small intestinal vessel density can support the diagnosis of CMP allergy. Promising studies are underway similar to those conducted on upper mesenteric artery flowmetry in patients with celiac disease.

Interesting studies between allergy and liver involvement have been conducted: the main role seems to be played by mast cells, a common point between the allergic cascade and that of NAFLD (14, 15,16,17)

Coeliac disease

The celiac disease is a peculiar intolerance to gluten, a protein widely spread in food, especially in wheat. The symptoms are related to malabsorption, and US signs respect the pathophysiology of the disease: intestinal loops stretched out by liquids, flattening of the mucosa and reduced wall thickness (18). Flowmeter changes are reported as expression of parietal inflammation, reversible after the introduction of a gluten-free diet (19, 20)

Conclusion:

The US takes an emerging role in the diagnosis of food allergy-based diseases in the child and supports the clinician in the diagnosis, but further studies are needed to improve the diagnostic margins.

Conflict of interest

The Authors declare that they have no conflict of interest

Informed consent:

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki declaration of 1975, and its late amendments. Additional informed consent was obtained from all patients for which identifying information is not included in this article

Human and animal rights

This article does not contain any studies with human or animal subjects performed by any of the Authors

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