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Original articles

What does Anisakis simplex parasitism in gastro-allergic Anisakiasis teach us about interpreting specific and total IgE values?

A. Daschner A. Alonso-Gómez and C.
 López Serrano

Antecedentes: la anisakiasis gastroalérgica es una entidad clínica, generalmente transitoria, producida por Anisakis simplex. La historia clínica sugiere su presencia y el diagnóstico se confirma por gastroscopia e IgE específica. Objetivo: describir un caso de anisakiasis gastroalérgica con una respuesta de IgE específica y total importante y los resultados de 10 meses de seguimiento serológico de la IgE específica y total. Métodos: la IgE total e IgE específica contra A. simplex se analizaron a las 24 horas y después de 1, 4, 6 y 10 meses. En los meses 4 y 10, se determinó la IgE específica frente a Ascaris lumbricoides y Echinococcus granulosus para valorar la sensibilidad cruzada. Resultados: se observó una elevación importante de IgE específica frente a Anisakis simplex (hasta 903 kU/l) a los seis meses y de IgE total (hasta 15.258 kU/l) al mes. Se detectó IgE específica con reactividad cruzada a Ascaris lumbricoides y Echinococcus granulosus. Conclusiones: consideramos que la elevación de IgE total y específica es una característica de la infestación por helmintos y encontramos una gran variabilidad en los valores de la IgE específica y total en los meses después de la reacción alérgica y parasitaria. La cantidad de IgE específica contra otros parásitos que pueden producir reactividad cruzada depende directamente del nivel de IgE total.

Palabras clave: Anisakis simplex. Anisakiasis gastroalérgica. IgE total. IgE específica. Expansión policlonal.

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Background: gastro-allergic Anisakiasis is a mostly transitory clinical entity caused by *Anisakis simplex* (*A. simplex*) and can be suspected by history and confirmed by fiberoptic gastroscopy and specific IgE. **Objective:** we report a case of gastro-allergic Anisakiasis, in which the parasite induces a high specific and total IgE response, and want to follow the specific and total IgE values by a serologic follow up over 10 months. **Methods:** an analysis of total IgE and specific IgE against *A. simplex* was performed within 24 hours, after 1, 4, 6 and 10 months. At month 4 and month 10 specific IgE against *Ascaris lumbricoides* and *Echinococcus granulosus* was determined in order to value cross-reactivity. **Results:** there is an important raise in specific IgE against *Anisakis simplex* (up to 903 kU/l) after 6 months and total IgE (up to 15,258 kU/l) after one month. Cross-reactive specific IgE against *Ascaris lumbricoides* and *Echinococcus granulosus* can be detected. **Conclusions:** we consider a raise of total and specific IgE as a typical feature of helminth infestation and learn that specific and total IgE values are highly variable in the months following the allergic and parasite-specific reaction. The amount of specific IgE against other cross reactive parasites depends directly on the total IgE values.

Keywords: *Anisakis simplex*. Gastric Anisakiasis. Total IgE. Specific IgE. Polyclonal stimulation. Cross-reactivity.

What does *Anisakis simplex* parasitism in gastro-allergic Anisakiasis teach us about interpreting specific and total IgE values?

A. Daschner, A. Alonso-Gómez and C. López Serrano

Sección de Alergia. Hospital General Universitario «La Paz». Madrid.

SUMMARY

Background: gastro-allergic Anisakiasis is a mostly transitory clinical entity caused by *Anisakis simplex* (*A. simplex*) and can be suspected by history and confirmed by fiberoptic gastroscopy and specific IgE.

Objective: we report a case of gastro-allergic Anisakiasis, in which the parasite induces a high specific and total IgE response, and want to follow the specific and total IgE values by a serologic follow up over 10 months.

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RESUMEN

Antecedentes: la anisakiasis gastroalérgica es una entidad clínica, generalmente transitoria, producida por *Anisakis simplex*. La historia clínica sugiere su presencia y el diagnóstico se confirma por gastroscopia e IgE específica.

Objetivo: describir un caso de anisakiasis gastroalérgica con una respuesta de IgE específica y total importante y los resultados de 10 meses de seguimiento serológico de la IgE específica y total.

Métodos: la IgE total e IgE específica contra *A. simplex* se analizaron a las 24 horas y después de 1, 4, 6 y 10 meses. En los meses 4 y 10, se determinó la IgE específica frente a *Ascaris lumbricoides* y *Echinococcus granulosus* para valorar la sensibilidad cruzada.

Resultados: se observó una elevación importante de IgE específica frente a *Anisakis simplex* (hasta 903 kU/l) a los seis meses y de IgE total (hasta 15.258 kU/l) al mes. Se detectó IgE específica con reactividad cruzada a *Ascaris lumbricoides* y *Echinococcus granulosus*.

Conclusiones: consideramos que la elevación de IgE total y específica es una característica de la infestación por helmintos y encontramos una gran variabilidad en los valores de la IgE específica y total en los meses después de la reacción alérgica y parasitaria. La cantidad de IgE específica contra otros parásitos que pueden producir reactividad cruzada depende directamente del nivel de IgE total.

Palabras clave: *Anisakis simplex*. Anisakiasis gastroalérgica. IgE total. IgE específica. Expansión policlonal.

INTRODUCTION

Diseases caused by *Anisakis simplex* are known since the early 60's and have been reported from all over the world (1-6). Gastric and gastro-allergic Anisakiasis are probably the most frequent clinical entities caused by this nematode. Gastric Anisakiasis is caused by the third-stage larva of *Anisakis simplex* acquired by eating raw or undercooked fish. In Japan about 1,000 cases of gastric Anisakiasis per year

are diagnosed and urticaria has been reported in about 10 per cent of cases (7, 8). In recent years gastro-allergic Anisakiasis has been reported as an acute parasitism by this nematode where gastric and allergic hypersensitivity symptoms appear simultaneously and where specific IgE against *A. simplex* can be detected by means of skin prick tests and seric specific IgE (9-13).

We report a case of gastroscopically confirmed gastro-allergic Anisakiasis, in which the parasite induces a high specific and total IgE response, detected by a serologic follow up over 10 months and discuss features of varying IgE values.

CASE REPORT

A 58 years-old woman arrived to the emergency room with epigastralgia, nausea and vomiting, as well as a generalized urticaria. Four hours prior to onset of symptoms she ate fresh, crude anchovies. No other suspected meal or drugs were ingested. A few hours after treatment with parenteral corticosteroids and anti-histamines, the urticarial reaction disappeared, but epigastric pain remained, so that a fiberoptic gastroscopy was performed.

A minimal erosion was detected in gastric mucosa, and a filariform white worm was removed out of it, which was identified as *A. simplex* by our microbiology service. Gastric symptoms disappeared within 2 hours after extraction of the worm and the patient could be discharged without further medication. She was told to avoid eating raw or undercooked fish in order to prevent new acute parasitism with gastric and allergic symptoms.

We performed analysis of total IgE (IMx-Method, Abbot Diagnostics, Chicago, Illinois) and specific IgE by CAP-FEIA (Pharmacia, Uppsala, Sweden) against *Anisakis simplex* and detected a very high total (15,258 kU/l) and specific IgE (712 kU/l) after one month, so that periodic controls of these parameters were performed. We could see the patient after 1, 4, 6 and 10 months (Fig. 1). After one month total IgE decreased constantly to near-initial values and specific IgE against *A. simplex* augmented slightly during 6 months, but after 10 months was found under the initial value. All the time the patient remained asymptomatic.

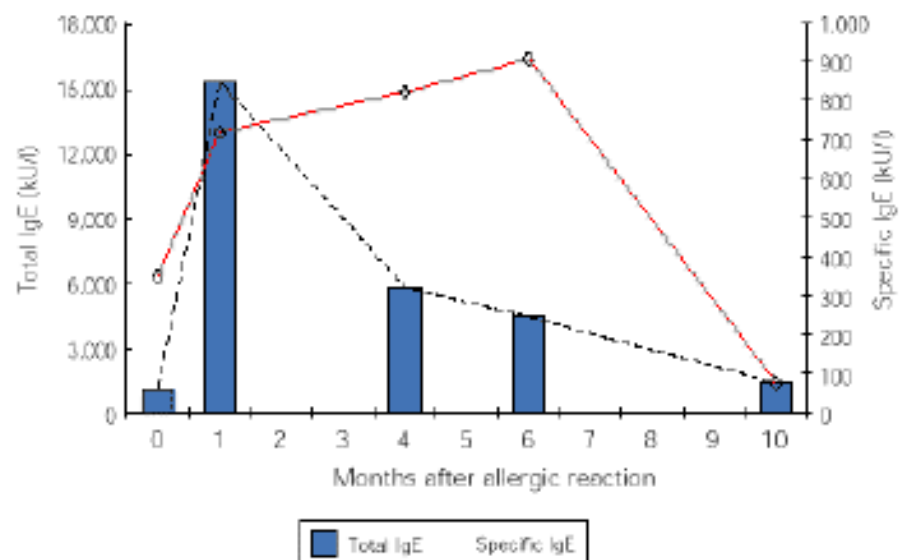


Figure 1.--Total and specific IgE (against *Anisakis simplex*) values in kU/l. Month "0" describes values obtained 60 hours after the allergic reaction.

Specific IgE against *Ascaris lumbricoides* and *Echinococcus granulosus* (CAP-FEIA) and a search for other parasitic disease was conducted, but stool specimen for parasites were negative, hemagglutination test for hydatid cyst was negative and no significant eosinophilia could be seen. Results for total IgE and specific IgE and their ratios can be seen in figure 1 and table I.

Table I Absolute values and ratios for total and specific IgE

	Month 0	Month 1	Month 4	Month 6	Month 10
Total IgE	1,067	15,258	5,812	4,413	1,411
IgE-Anisakis	383	712	846	903	98
IgE-Anisakis/total IgE	35.9%	4.7%	14.6%	20%	6.9%
IgE-Ascaris	n.d.	n.d.	41.2	n.d.	9.9
IgE-Ascaris/IgE-Anisakis	n.d.	n.d.	4.9%	n.d.	10.1%
IgE-Ascaris/total IgE	n.d.	n.d.	0.7%	n.d.	0.7%
IgE-Echinococcus	n.d.	n.d.	10.6	n.d.	1.8
IgE-Echinococcus/IgE-Anisakis	n.d.	n.d.	1.2%	n.d.	1.8%
IgE-Echinococcus/total IgE	n.d.	n.d.	0.18%	n.d.	0.13%

Values for total and specific IgE against *Anisakis simplex*, *Ascaris lumbricoides*, *Echinococcus granulosus* at month 0, 1, 4, 6 and 10 after allergic reaction. Values are in kU/l. Ratios are given in %. n.d.: no data available.

DISCUSSION

High IgE levels and induction of a specific IgE response are a typical features of helminth infestation and a significant increment of total and specific IgE after acute parasitism could be found in animal models (14-16). So IgE levels can be used for monitoring clinical outcome of anti-parasite treatment. We already showed that *Anisakis simplex* was able to enhance specific and total IgE values in an acute parasitism, even if contact with gastric mucosa was only a few hours (17).

Our patient could be followed over a 10 months period, so that we can learn about dynamics of seric specific and total IgE.

With gastro-allergic Anisakiasis we have at our disposal a model of acute parasitism, where the exact infestation time can be elucidated by history. When the nematode is extracted by gastroscopic means, allergic as well as gastric symptoms disappear and acute parasitism ceases. In our patient peak IgE values were found after 30 days. This

is concordant with animal studies, where it has been shown that rats inoculated with third stage larvae of *A. simplex* peak specific IgE against this larva at 30 days after infection (14). Total IgE diminishes then progressively and reaches nearly initial values after 10 months. It is interesting that in this patient specific IgE still augments slightly after one month, reaching a peak value after 6 months, but decreasing afterwards to a value inferior to the initial one. In this respect the proportion between specific IgE against *Anisakis simplex* and total IgE varies widely, with a high proportion of nearly 36% at 60 hours and minimal quotient of 4.7% after one month. A high proportion of newly synthesized IgE antibodies is "useful" in an allergic reaction, as these new specific IgE antibodies can compete more effectively with non-specific IgE antibodies for binding to cell receptors and initiate a reaction by degranulation of mast cells and basophils (18). We suspect that the initial specific IgE value was widely inferior to 383 kU/l and that a rapid recruitment of specific IgE producing cells is responsible for the high and over 6 months maintained specific IgE values as is to be expected in a reaction resembling immunologic memory. In contrast, total IgE augments more than 1,500% of the initial value as a typical marker of a parasite immunologic stimulation, but decreases rapidly after this 30 days. In this respect the highest proportion of specific/total IgE was detected near the allergic type I hypersensitivity reaction. On the other side the lowest proportion was found at the peak total IgE, probably induced by the live parasite and not by the "allergen".

In other words the high and transitory polyclonal total IgE response seems to be produced by parasite factors other than the allergen, that induces a specific and in this case longer lasting IgE response.

The nonspecific nature of a polyclonal stimulation can suppress allergic responses by causing mast cell blockade by Fc* receptor saturation. It has repeatedly been postulated that the induction of a high IgE response could be a mechanism of evasion by the parasite (19, 20). On the other hand a protective effect of parasitic disease on allergic diseases has been postulated (19, 21), this being partly due to a dilutive effect of high IgE levels induced by the parasite, so that basophils and mast cells can not be triggered. Thus the excess IgE represents a means of evasion of the parasite from one possible immune response. In this respect it has been shown that high total IgE levels predisposes to reinfection after antihelminthic treatment (22).

A high prevalence of sensitization to *Anisakis simplex* in patients with increased levels of total IgE was reported previously in our area (23). Taking into account, that after acute parasitism by this nematode, total IgE levels can remain high several months, and that because of raw fish eating habits up to 16% of the general population has specific IgE against this parasite in the area studied, it is not surprising to find high IgE levels, depending on the time interval between "allergic" reaction and blood-extraction (24).

Another interesting feature of this case report is the detection of specific IgE against other parasites, namely *Ascaris lumbricoides* and *Echinococcus granulosus*. Infestation by these parasites has been ruled out and the plausible reason of this finding is cross-reactivity with *Anisakis simplex*, as has previously been described (24, 25). These specific IgE values vary considerably, but correlate with specific IgE against *Anisakis simplex* and above all with total IgE. In an extrapolation, it is to be expected, that *Echinococcus* IgE antibodies will be undetectable (< 0.35 kU/l), if total IgE decreases to about 274 kU/l and *Ascaris* IgE antibodies would not be

detected in total IgE values under 50 kU/l.

We learn much about this case in handling with specific and total IgE:

1. It is important to consider the time of blood extraction after an allergic reaction and/or acute parasitism, when we want to interpret total IgE values.
2. The proportion of specific and total IgE varies after a parasite immunological reaction. In contrast in further studies it should be determined how specific and total IgE vary in time after a non-parasitic allergic reaction, e.g. by a food-allergen (17).
3. Specific IgE is not to be considered "negative" or "positive", but is always to be related to total IgE values.

REFERENCES

1. Mira Gutiérrez J, García Martos P, Hilario Madrid LM, Rodríguez Iglesias MA. Anisakiasis, una parasitosis emergente en nuestro medio. Rev Clin Esp 1995;195:51-4.
2. Van Thiel PH, Kuipers FC, Rosman RT. A nematode parasitic to herring causing acute abdominal syndromes in man. Trop Geogr Med 1962;2:97-113.
3. Lucas SB, Cruse JB, Lewis AAM. Anisakiasis in the United Kingdom. Lancet 1985;1:843-4.
4. Pinkus GS, Coolidge C, Little MD. Intestinal Anisakiasis. First case report from North America. Am J Med 1975;59:114-20.
5. Kliks MM. Anisakiasis in the western United States: four new cases reports from California. Am J Trop Med Hyg 1983;32: 526-32.
6. McKerrow JH, Sakanari J, Deardorff TL. Anisakiasis: revenge of the sushi parasite. NEJM 1988;319:1228-9.
7. Oshima T, Kliks M. Effects of marine mammal parasites on human health. Int J Parasitol 1987;17:415-21.
8. Kasuya S, Hamano H, Izuni S. Gastric Anisakiasis with anaphylactoid reaction. ACI News 1989;1:140-1.
9. Alonso A, Daschner A, Moreno-Ancillo A. Anaphylaxis with *Anisakis simplex* in the gastric mucosa. NEJM 1997;337: 351-2.
10. Daschner A, Alonso A, Vicente J, et al. Anisakiasis gástrica. ¿Son siempre inocuos los boquerones en vinagre? Emergencias 1997;9:173-5.

11. Daschner A, Alonso-Gómez A, Mora C, Moreno-Ancillo A, Villanueva R, López-Serrano MC. Gastro-allergic Anisakiasis with massive parasitism. *Rev Esp Alergol Inmunol Clín* 1997; 12:370-2.
12. Daschner A, Alonso-Gómez A, Caballero MT, Barranco P, Suárez de Parga JM, López-Serrano MC. Gastro-allergic Anisakiasis: an underestimated cause of acute urticaria and angioedema? *Br J Dermatol* 1998;139:822-8.
13. Daschner A, Alonso-Gómez A, Cabañas R, Suárez-de-Parga JM, López-Serrano MC. Gastroallergic anisakiasis: borderline between food allergy and parasitic disease - clinical and allergologic evaluation of 20 patients with confirmed acute parasitism by *Anisakis simplex*. *J Allergy Clin Immunol* 2000;105: 176-81.
14. Amano T, Nakazawa M, Sugiyama H, Secor WE, Oshima T. Specific antibody patterns of Wistar rats inoculated with third stage larvae of *Anisakis simplex*. *J Parasitol* 1995;81:536-42.
15. Finkelman F, Pearce E, Urban J, Sher A. Regulation and biological function of helminth-induced cytokine responses. *Immunol Today* 1991;12:62-6.
16. Lynch NR. Immediate hypersensitivity (allergic) reactions to intestinal helminthic infections. *Baillieres Clin Trop Med Commun Dis* 1987;2:573-93.
17. Daschner A, Alonso-Gómez A, Caballero MT, Suárez de Parga JM, López-Serrano MC. Usefulness of early serial measurement of specific and total IgE in the diagnosis of gastro-allergic Anisakiasis. *Clin Exp Allergy* 1999. *Clin Exp Allergy* 1999;29:1260-4.
18. Windelborg Nielsen B, Lind P, Hansen B, Reimert CM, Nansen P, Schiotz PO. Immune response to nematode exoantigens: sensitizing antibodies and basophil histamine release. *Allergy* 1994;49:427-35.
19. Lynch NR, Hagel IA, Palenque ME, Di Prisco MC, Escudero JE, Corao LA, et al. Relationship between helminthic infection and IgE response in atopic and nonatopic children in a tropical environment. *J Allergy Clin Immunol* 1998;101:217-21.
20. Allen JE, Maizels RM. Immunology of human helminth infection. *Int Arch Allergy Immunol* 1996;109:3-10.
21. Lynch NR, Medouze L, Di Prisco-Fuenmayor MC, Verde O, López RI, Malave C. Incidence of atopic disease in a tropical environment: partial independence from intestinal helminthiasis. *J Allergy Clin Immunol* 1984;73:229-33.
22. Hagel I, Lynch NR, Di Prisco MC, Rojas E, Pérez M, Álvarez N. *Ascaris* reinfection of slum children: relation with the IgE response. *Clin Exp Immunol* 1993;94:80-3.
23. Pascual C, Crespo JF, Ortega N, Ornia N, San Martín MS, Martín Esteban M. High prevalence of sensitization to *Anisakis simplex* in patients with increased levels of total IgE [Abstract]. *J Allergy Clin Immunol* 1996;97:233.

24. Muñoz Pereira M, San Martín M, Ornia N, Ortega N, Pascual C, Martín Esteban M. Incidencia de IgE específica frente a *Anisakis simplex* y *Ascaris lumbricoides* en población normal y atópica [Abstract]. Rev Esp Alergol Inmunol Clín 1996;11: Extraordinario núm 2:197-8.

25. Kennedy MW, Tierney J, Ye P, McMonagle FA, McIntosh A, McLaughlin D, et al. The secreted and somatic antigens of the third stage larva of *Anisakis simplex*, and antigenic relationship with *Ascaris suum*, *Ascaris lumbricoides*, and *Toxocara canis*. Mol Biochem Parasitol 1988;31:35-46.