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International Journal of Infectious Diseases

journal homepage: www.elsevier.com/locate/ijid



Case Report

Anisakis, just think about it in an emergency!

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ARTICLE INFO

Article history:

Received 20 April 2013

Received in revised form 14 May 2013

Accepted 15 May 2013

Corresponding Editor: Eskild Petersen,
Aarhus, Denmark

Keywords:

Raw anchovies
Parasitosis
Acute abdomen
Nematodes
Zoonosis
Italy

SUMMARY

A few years ago, Anisakis infection was almost unknown. Since the first observation in the Netherlands in 1960, several cases of gastrointestinal infections due to a zoonosis sustained by this nematode have been described in countries in which the consumption of raw or uncooked fish (e.g., marinated or salted) is common. Japan alone accounts for 90% of all cases of anisakiasis described in the literature because of the widespread use of raw fish in traditional Japanese cuisine, with sushi and sashimi. Nonetheless, other cases have been reported in Europe, North and South America, and Asia. In Italy, this zoonosis is rare and mostly transmitted by the ingestion of marinated anchovies in coastal areas, or fashion foods (sushi, sashimi, etc.) in inland areas. Once eaten, this parasite can cause an acute form of disease characterized by severe abdominal pain, and for this reason many patients receive the final diagnosis only on obtaining the surgical specimen. Since conservative medical treatment for acute anisakiasis relies on endoscopic removal of the nematode from the gastrointestinal wall if performed within 12 h from the ingestion of contaminated fish, it should be compulsory to consider this parasitosis in the accident and emergency department. Here we describe two cases of infection by *Anisakis simplex* due to ingestion of marinated anchovies in a coastal area of the Tyrrhenian Sea and discuss the types and varieties of Anisakis infection in humans.

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1. Introduction

Anisakiasis is a parasitosis caused by the ingestion of raw fish contaminated with *Anisakis simplex*.¹ Human infections were first described in the Netherlands in 1960 and then in different countries. In recent years, a few cases of anisakiasis have also been described in Italy.² We describe two acute cases of infection due to marinated anchovies and discuss anisakiasis in humans.

2. Case reports

2.1. Case 1

The first case was a 57-year-old woman admitted to the accident and emergency department with a sudden onset of severe abdominal pain, vomiting, and diarrhea. A week before presentation, she had complained of a fever and a mild diffuse abdominal pain that recovered spontaneously. At admission, physical examination revealed severe tenderness with guarding and no bowel sounds; blood tests showed leukocytosis and a

high C-reactive protein value. The patient underwent an urgent abdominal ultrasound scan and a computed tomography scan; a thickening of the gastric antrum, mild pancreatitis, and fluid accumulation within the peritoneal cavity were found. Initial clinical management included the insertion of a nasogastric tube, intravenous proton pump inhibitors, and volume replacement. She remained under careful observation for the first 12 h to decide whether a surgical intervention was required. The patient then began to show a gradual improvement, and after 24 h underwent an upper endoscopy to study the antral thickening. This revealed esophagitis (class B according to the Los Angeles classification), fundus and corpus gastritis, and a normal antrum (histology: mild gastritis, without *Helicobacter pylori*). Three days later, in a stable clinical condition, she discharged herself from the hospital.

After 20 days, with persistent moderate abdominal pain, the patient came to our attention for a follow-up. At this time an ultrasound abdominal scan again confirmed the antral thickening (9 mm); blood tests were normal. After a careful interview, she revealed that before the onset of symptoms she had eaten raw anchovies. IgE dosage against p4 *A. simplex* was consequently performed, with a highly positive result (>100 kU/l; normal range between 0.00 and 0.35 kU/l) in the absence of eosinophilia. No specific treatment was recommended at that time.

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Six months later, the patient had almost completely recovered, with only mild irritable bowel syndrome-like abdominal pain. Blood tests showed a hyper-IgE (3.324 IU/ml, normal value <87 IU/ml) with a specific IgE titer for *A. simplex* >100 kU/l (normal value 0.00–0.35 kU/l).

2.2. Case 2

The second case was a 46-year-old man with an acute onset of epigastric pain and an allergic reaction that required corticosteroids, shortly after the ingestion of raw anchovies. He was immediately admitted to the A&E department, and after obtaining a comprehensive history and performing a physical examination and blood tests, an urgent upper endoscopy was required to support clinical findings. During the upper endoscopy, a larva was demonstrated at the esophago-gastric junction, which was removed with forceps. The parasite was sent to the Zooprophy-lactic Institute, which confirmed that the larva belonged to the *Anisakis spp.* After removal of the larva, the patient recovered immediately. Specific blood tests revealed only a strong increase in total IgE (615.1 kU/l, normal value between 0.00 and 0.35 kU/l), and a skin prick test confirmed a hypersensitivity against *A. simplex*.

3. Discussion

A few years ago, *Anisakis* was almost unknown in Italy. Several cases of infection have been described in countries in which the consumption of raw fish is common (e.g. sushi in Japan, cod liver in Scandinavia), with a variety of clinical manifestations. *A. simplex*, together with *Anisakis pegreffii* and *Phocanema decipiens*, belongs to a group of nematodes that accidentally infect humans during their reproductive cycle.¹ The larvae recognize marine mammals as a primary host, but the infective (L3) parasite can be ingested by edible fish (sardines, anchovies, etc.) and then accidentally eaten by humans. Once eaten, *A. simplex* can break the gastrointestinal mucosal layer, enter into the intestinal mucosa forming a granuloma, where, a few weeks later, it dies.³

Epidemiologically, *A. simplex* infections have been described globally, with a marked prevalence in Japan. Indeed, Japanese cases alone account for more than 90% of all case reports (about 2000 cases per year),⁴ and some other patchy cases are reported in Europe, the USA, and Australia. In Europe, it has been described particularly in Spain. One study showed that *A. simplex* was found in 39.4% of the fresh mackerel examined from different fish markets in Granada, Spain.⁵ Recently, a prevalence of 55.6% of *A. simplex* infestation has been seen in blue whiting fish sold in five supermarkets of a national chain across Spain. In Italy, a few cases have been described, particularly in association with the ingestion of marinated anchovies. Also, *A. simplex* has been linked to sensitization and occupational diseases among professionally exposed categories, with a prevalence up to 20.2% of specific IgE against *A. simplex* in fishermen.

Clinically, following its penetration in the human gastrointestinal tract, *A. simplex* can cause gastrointestinal (classified as acute, chronic, or ectopic reactions) or allergy symptoms. The clinical manifestations vary depending on the organ infected and which

Anisakis spp. is ingested. In Japan, it occurs most commonly as a gastric infection, while intestinal disease is more common in Europe.⁴

The acute reaction typically involves the stomach and is characterized by abdominal pain, vomiting, and nausea within hours of the ingestion of contaminated food, mimicking an acute abdominal syndrome. In this form, an upper endoscopy performed within 12 h of the ingestion of larvae is essential to allow the localization and removal of *A. simplex* with a complete resolution.⁶ Some authors recommend the use of narrow banding imaging to better visualize *A. simplex*, which otherwise may resemble mucus.⁷

The chronic form is due to the localization of *A. simplex* in the intestinal wall. Typically, symptoms persist for months, with mild cramping abdominal pain, weight loss, and diarrhea, and it can be difficult to diagnose. A subtype of this form is characterized by the migration of the larvae beyond the gastrointestinal wall, with the localization of the parasite in the peritoneal cavity or in solid or hollow organs, causing symptoms related to the involved organ.

The allergic form occurs within hours of the ingestion of contaminated fish. Several cases of anaphylactic shock, hypersensitivity reactions, urticaria, and angioedema have been described in association with the ingestion of or re-exposure to contaminated fish, predominantly in Spain.

As mentioned above, the medical treatment of the acute form consists of the endoscopic removal of the living larvae from the gastrointestinal wall. In contrast, the treatment of chronic and ectopic anisakiasis depends on the medical complications produced by the larvae, ranging from the need for surgical removal of the granuloma to the use of steroids to reduce local inflammation. Unfortunately, as no effective pharmacological treatment is able to kill the larvae once eaten, the only protection against *A. simplex* is the correct storage and processing of raw fish (freezing at temperatures lower than 20 °C for at least 24 h).

In conclusion, the widespread use of raw fish means that physicians should suspect this zoonosis promptly when a patient presents with severe abdominal pain following the ingestion of raw or uncooked fish. If this disease is suspected and endoscopy is available, the endoscopic removal of the larvae can result in the resolution of symptoms, avoiding unnecessary medical or surgical interventions.

Conflict of interest: None to declare.

References

1. European Food Safety Authority. Scientific opinion on risk assessment of parasites in fishery products. EFSA Panel on Biological Hazards (BIOHAZ). *EFSA Journal* 2010;8.
2. Mattiucci S, Fazii P, De Rosa A, Paoletti M, Megna AS, Glielmo A, et al. Anisakiasis and gastroallergic reactions associated with *Anisakis pegreffii* infection, Italy. *Emerg Infect Dis* 2013;19:496–9.
3. Kliks MM. Human anisakiasis: an update. *JAMA* 1986;255:2605.
4. Hochberg NS, Hamer DH. Anisakidosis: perils of the deep. *Clin Infect Dis* 2010;51:806–12.
5. Adroher FJ, Valero A, Ruiz-Valero J, Iglesias L. Larval anisakids (*Nematoda: Ascaridoidea*) in horse mackerel (*Trachurus trachurus*) from the fish market in Granada, Spain. *Parasitol Res* 1996;82:319–22.
6. Sugimachi K, Inokuchi K, Ooiwa T, Fujino T, Ishii Y. Acute gastric anisakiasis. Analysis of 178 cases. *JAMA* 1985;253:1012–3.
7. Taranto D, Sessa G, Tortora R, Tremolaterza F. Narrow band imaging enhancement could improve gastric *Anisakis* detection. *Dig Liver Dis* 2011;43:e5.