

# Anisakiasis

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Adult *Anisakis simplex* have been found in the stomachs of whales, seals, sea lions, walruses and dolphins. Humans are incidental hosts and the human “equivalent” of anisakiasis for sea animals is ascariasis. The eggs are eliminated with the faeces. In sea water the eggs hatch after embryonation after which the released larvae penetrate small crustaceans e.g. copepods or krill, which then in turn are eaten by fish or cephalopods. *Anisakis* larvae are usually restricted to the fish viscera in vivo only infesting the muscles after the fish has been killed, particularly if the fish is not promptly gutted and cleaned after its death. Humans become infected by eating undercooked or raw infected marine fish. The parasites which measure about 2-3 cm in length attach themselves to the gastric or intestinal mucosa by their anterior parts as far as the muscularis mucosa. This makes them visible during endoscopy.

In humans the parasites do not reach the adult stage and usually die off spontaneously after 3 weeks. The dying organism induces an inflammatory reaction and a tissue abscess develops with a predominance of eosinophils. **Gastric pain and nausea/vomiting** may occur within a few hours after eating infected fish or cephalopod but symptoms may have a late onset with abdominal pain appearing up to three weeks later. Late manifestations have rarely been described (several weeks to months) and are due to more distal intestinal infections. The infection is sometimes confused initially with appendicitis, stomach ulcer, duodenal ulcer, stomach cancer or Crohn’s disease. Rarely the worms perforate the intestinal wall and are found in the peritoneum. Eosinophilia is present. Approximately 95% of all cases in the world, which amounts to some 2000 cases annually, occur in Japan. Many different species of *Anisakis* larvae are being recognized as the cause of **urticaria and hypersensitivity reactions** after eating fish. The worm can in fact trigger quite dramatic hypersensitivity reactions even after it is dead. The first signs of an allergic reaction usually occur 60-120 minutes after ingestion, but may be delayed for up to 6 hours later probably due to passage of the food bolus through the gastro-intestinal tract. This means that urticaria and angio-oedema may occur at night. The diagnosis of allergy to *Anisakis simplex* is based on (1) a compatible anamnesis such as urticaria or angio-oedema after consumption of saltwater fish, (2) a positive skin prick test, (3) specific IgE against *Anisakis simplex* via radio-immunoassay, (4) negative reactions to the proteins of fish. There are some people who have antibodies to *Anisakis* without ever having exhibited symptoms.

Therapy of anisakiasis consists of mechanical removal by means of surgery (in case of intestinal obstruction) or endoscopic extraction. Ivermectin and albendazole therapy has been suggested.

Thorough cooking to 70°C or adequate freezing to -20°C for a minimum of 72 hours are the best preventive measures.

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