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Outbreaks of Trichinellosis Linked to Consumption of Walrus Meat

Background

Trichinellosis is a parasitic disease that occurs after consumption of raw or undercooked meat infected by roundworm species in the genus *Trichinella*. Early signs and symptoms occur 1–2 days after ingestion and include diarrhea, abdominal pain, fatigue, nausea, and vomiting. Systemic signs and symptoms, which typically occur 1–2 weeks after ingestion and last for 1–8 weeks, include eosinophilia, facial and periorbital edema, fatigue, remittent fever and chills, headache, myalgia, nausea, and pruritic skin (with or without a rash).

Historically in the United States, trichinellosis has been most frequently attributed to consumption of pork products; however, multiple wild game species are competent hosts for *Trichinella* spp. and are now collectively implicated in the majority of trichinellosis cases nationally. Since 1975, over half of all trichinellosis cases reported in Alaska, including the three largest outbreaks recorded in the state (in 1975, 1979, and 1988),¹ were known (100/241, 41%) or suspected (24/241, 10%) to have been due to walrus consumption (Figure). The frequency of walrus-associated trichinellosis has declined in recent years from an average of 6.3 cases per year during 1975–1992 (113 cases over 18 years) to an average of 0.5 cases per year during 1993–2017 (as of July 7, 2017, 11 cases over 24.5 years). This *Bulletin* describes two recent outbreaks of trichinellosis associated with the consumption of raw or undercooked walrus meat in two communities in the Norton Sound region during July 2016–May 2017. These communities are separated by <150 km, and residents harvest walrus from the same hunting grounds in the northern Bering Sea.

Investigations

The first outbreak began in July 2016 and involved two adolescent and three adults from two households who had consumed walrus meat either raw or pan-fried (to “medium doneness”). All reported moderate to severe muscle and joint pain; other reported symptoms included fever, weakness, rash, nausea, and diarrhea. Blood tests showed that all five patients had elevated eosinophil counts (18% to 50% of total leukocytes) and four had elevated creatine kinase levels. Three of the five persons tested positive for *Trichinella* immunoglobulin G (IgG) by Enzyme-linked Immunosorbent Assay (ELISA). All five patients were treated with albendazole and made a fully recovery. No left-over walrus meat was available for testing.

The second outbreak began in April 2017 and involved five adult Alaska Native persons from two households who had shared a meal of walrus meat boiled for approximately 1 hour such that portions of meat remained undercooked or raw. Four of the five patients reported muscle and joint pain, and one patient reported facial edema. Blood tests showed that all five had elevated eosinophil counts (11% to 51% of total leukocytes) and four of the five had elevated creatine kinase levels. Two of the five patients tested positive for *Trichinella* IgG antibodies on ELISA. All five patients were treated with albendazole and made a fully recovery. Larvae of *T. nativa*

were detected by microscopy and polymerase chain reaction (PCR) from a sample of frozen walrus meat collected from the index patient’s household freezer.

Discussion

Two consecutive trichinellosis outbreaks involving five cases each occurred in Norton Sound in 2016 and 2017. Both of these outbreaks involved consumption of raw or undercooked meat. Multi-case outbreaks of walrus-associated trichinellosis in Alaska had not been previously identified since 1992.² The reasons for the decline in walrus-associated trichinellosis cases are unknown and might include decreased parasite burden in walruses; changes in the timing and location of walrus hunting; improved methods used to store, collect, handle, or prepare walrus meat for consumption; changes in diagnostic testing practices; or decreased public/provider awareness.

After the first outbreak, an updated trichinellosis poster had been developed and was being piloted when the second outbreak occurred. Factsheets and public service announcements were also subsequently distributed in the region.³ A more detailed description of these outbreaks and walrus-associated trichinellosis in Alaska was published in the Centers for Disease Control and Prevention’s Morbidity and Mortality Weekly Report on July 6, 2017.⁴

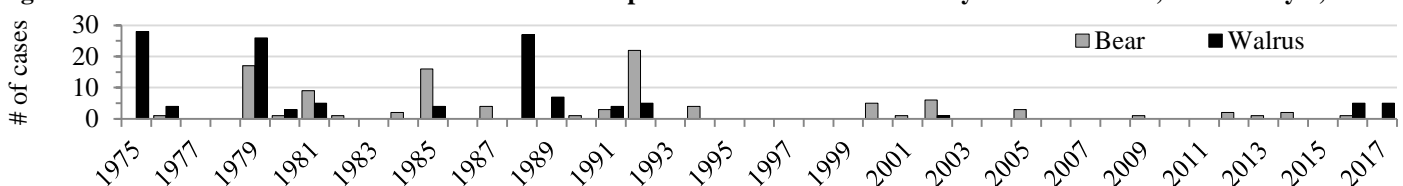
Recommendations

1. Health care providers should inquire about consumption of both commercially prepared and personally harvested meats, and methods of meat preparation, when evaluating suspected trichinellosis cases.
2. Report all suspected and confirmed cases of trichinellosis to the Section of Epidemiology (SOE) by calling 269-8000 (see: <http://dhss.alaska.gov/dph/Epi/Pages/pubs/conditions>).
3. Albendazole is recommended for treatment of trichinellosis.⁵ Additionally, patients are sometimes prescribed prednisone for muscle and joint pain.
4. The public should be educated about cooking methods that can reduce the probability of infection by *Trichinella* spp., including fully cooking meat to $\geq 160^{\circ}\text{F}$, using a food thermometer to measure the internal temperature of cooked meat, washing hands after handling raw meat, and cleaning meat grinders thoroughly after each use.⁶

References

1. Margolis HS, Mittleman JP, Burgess RD. Arctic trichinosis: two Alaskan outbreaks from walrus meat. *J Infect Dis* 1979;139:102–5.
2. Alaska Epidemiology *Bulletin*. “Trichinellosis Cases – Alaska, 2005–2014.” No. 6, March 18, 2015. Available at: http://www.epi.alaska.gov/bulletins/docs/b2015_06.pdf
3. SOE. Trichinellosis Factsheet and Poster. Available at: <http://dhss.alaska.gov/dph/Epi/id/Pages/dod/foodwater/default.aspx>
4. Springer YP, et al. Outbreak of trichinellosis linked to consumption of walrus (*Odobenus rosmarus*) meat—Alaska, 2016. *MMWR* 2017;66:692–96. Available at: <http://dx.doi.org/10.15585/mmwr.mm6626a3>
5. CDC. Trichinellosis Resources for Health Professionals. Available at: https://www.cdc.gov/parasites/trichinellosis/health_professionals/index.html
6. USDA. Trichinae. Available at: https://www.aphis.usda.gov/vs/trichinae/docs/fact_sheet.htm

Figure. Cases of Trichinellosis Associated with Consumption of Bear* and Walrus† by Year — Alaska, 1975 – July 1, 2017



*Bear includes cases for which the patient reported consuming bear and seal and a single implicated source of infection could not be identified (103/241, 43%).

†Walrus includes cases for which the patient reported consuming walrus and seal and a single implicated source of infection could not be identified (124/241, 51%).

(Contributed by Yuri Springer, PhD Section of Epidemiology.)