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## Trichinosis - Another Hazard of the North

On July 4, 1991, three men from Southcentral Alaska went camping on the Kenai Peninsula. Two of them ate a piece of bear meat which they grilled over a campfire. About a week later, both men became ill. The first, a 28-year-old on active duty in the Air Force, had profuse watery diarrhea, low grade fever, general malaise, and diffuse myalgia. The other, 36 years old, developed diarrhea, fever, chills, weakness and general myalgia. When the second person subsequently developed facial swelling, rash, and temporal muscle pain, the diagnosis of trichinosis was considered and he was admitted to Valley Hospital in Palmer. On admission, he had a WBC differential with 40% eosinophils.

On July 30, upon learning of his friend's diagnosis, the 28-year-old presented to the Primary Care Clinic at Elmendorf Air Force Base Hospital. At that time, he had a temperature of 101.8°, mild periorbital edema, diffuse muscular tenderness, and mild confusion. The patient's WBC differential had 30% eosinophils. He was admitted to the hospital with the diagnosis of trichinosis. Both patients were treated with mebendazole and a short course of prednisone. Each was discharged after about a week and had a slow recovery complicated by diffuse myalgia and arthralgia.

The meat they consumed came from a black bear which had been shot in September 1990 near Skwentna, AK by the third man on the camping trip. Frozen meat was distributed to two households in the Anchorage area, as well as persons in Washington State and Rhode Island. There were no ill individuals in these households and persons were aware of the danger of trichinosis from eating undercooked bear meat.

During the July 4 camping trip, wet weather made it difficult to maintain the campfire and, as a result, the meat was not thoroughly cooked. A specimen examined at the Alaska Department of Environmental Conservation Laboratory had >500 *Trichinella spiralis* cysts per gram, an extremely heavy load.

**Comments:**

Trichinosis is caused by consumption of meat containing viable *T. spiralis* cysts. Once ingested, the cysts develop into adult worms in the epithelium of the small intestine. Gravid females produce larvae which penetrate the gut wall, disseminate via the bloodstream, and become encysted in skeletal muscle.

Patients with trichinosis usually develop gastrointestinal symptoms including diarrhea, abdominal pain, nausea, or vomiting about 1 week after consumption of meat bearing cysts. After several more days, as the larvae disseminate, fever, prostration, myalgia, rash, and periorbital edema may occur. At this stage, eosinophilia can be as high as 70% if a large number of viable cysts have been consumed. The severity of illness is directly proportional to the infective dose and can vary from inapparent infection to fulminating, fatal illness. In severe infections, myocardial failure, pneumonitis, and encephalitis can occur.

Between 1974 and 1991, 172 cases of trichinosis--an average of nearly 10 cases per year--have been reported to the Section of Epidemiology. Only 19 of the cases were solitary patients with trichinosis. **All 153 others were associated with multiperson outbreaks ranging in size from 2 to 27 cases** (median = 4.0 cases). Overall, of 37 single- or multiperson outbreaks, 26 (70%) were among Alaska Natives, 8 (22%) were among non-Natives, and 3 (8%) were among persons of unknown race. Twenty-five (68%) of the outbreaks occurred between May and October, months during which there may be increased consumption of wild game meats. All outbreaks were caused by consumption of raw or undercooked meat. Among 26 outbreaks with complete documentation, 14 (54%) were due to consumption of bear meat (black, brown, or polar), 11 (42%) were due to walrus, and 1 (4%) was due to either walrus or seal.

**Recommendations:**

1. Trichinosis probably is frequently unrecognized. This may be particularly true in Alaska where bear or walrus meat are consumed by many individuals. Health-care providers should consider trichinosis in any patient with constitutional symptoms following a gastrointestinal illness if there is a history of recent bear or walrus consumption. The diagnosis is strongly supported if the patient has >5% eosinophils.
2. All bear and walrus meat should be thoroughly cooked before eating. Meat can be considered safe only if it has changed from a red or pink color to completely gray. The *T. spiralis* strain which infects bear and walrus in Alaska is cold-resistant. Therefore, freezing (which effectively destroys *T. spiralis* cysts in pork) will not render arctic meat safe for consumption.
3. As noted above, most trichinosis cases occur as part of multiperson outbreaks--single, unrelated cases are the exception. Our investigations have usually identified additional ill persons and have located contaminated meat which might have been consumed by other people, resulting in more illnesses. Because a single case of trichinosis implies that other people may be ill or at risk, all cases of trichinosis should be promptly reported when suspected to the Section of Epidemiology.
4. The drug of choice for treatment of trichinosis is mebendazole (Vermox®). The adult dosage is 200-400 mg tid for 3 days followed by 400-500 mg tid for 10 days. As an alternative, thiabendazole (22 mg/kg bid for 5-7 days) can be used to eradicate adult worms from the gut; however, it appears to be ineffective against migrating or encysting larvae. Corticosteroids are useful only for severe cases (e.g., myocardial or CNS involvement). Non-steroidal antiinflammatories may provide some symptomatic relief.

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