

Alert to Neurologists — Help Needed to Help Solve Mysterious Neurological Illness at Minnesota Pork Plant

By Kurt Samson

ARTICLE IN BRIEF:

✓ Health officials are speculating — but are not sure — that an unknown inflammatory polyneuropathy may have been caused by exposure to an infectious agent in airborne brain particulate matter.

An unusual illness in a dozen workers at a Minnesota pork processing plant has state health officials concerned that the cluster could be an unknown animal-borne nervous system disease.

All of the employees worked in an area where compressed air was used to cleanse brain cavities, giving rise to speculation that the illness — health officials are calling it an unknown inflammatory polyneuropathy — may have been caused by exposure to an infectious agent in airborne brain particulate matter.

In early November, the Minnesota Department of Health launched an investigation at the Quality Pork Processors plant in Austin, where at least a dozen workers reported neurological symptoms in the past year, including leg pain and weakness, sensitivity changes, and marked fatigue.

Early reports suggested chronic inflammatory demyelinating polyneuropathy (CIDP), which damages the myelin sheath surrounding nerves and typically progresses for months. However, CIDP, as a specific diagnosis, was ruled out after workers were examined by neurologists and had nerve conduction studies.

UNUSUAL SYMPTOMS, SIMILAR TO CIDP

According to Daniel Lachance, MD, the Mayo Clinic neurologist who is caring for many of the workers, “an astute nurse” at the plant brought the symptoms to the attention of local Austin physicians, who in turn notified the Mayo Clinic. The clinic treats many patients from the area of southern Minnesota where the plant is located. Dr. Lachance, who sees neurological patients in Austin and is also a neuroimmunologist and neuro-oncologist, recog-

nized the symptoms as being unusual.

He told *Neurology Today* in a telephone interview that while the illness shares many similarities with CIDP, tests have shown it has a different signature. Unlike CIDP, which is characterized by slowing or blocking of nerve conduction, the workers’ illness can be categorized only as an inflammatory response that is attacking nerve roots proximally, and peripheral motor nerves distally, he explained.

“While they do have electrophysiological evidence for peripheral nerve involvement and the disorder appears associated with a remarkable activation of the immune system, the clinical picture is different from CIDP,” he said. “The clinical symptoms and MRI findings suggest that nerve roots are primarily affected, so the syndrome is best characterized as an inflammatory polyradiculopathy.”

The Minnesota Health Department was quick to emphasize that the workers did not have multiple sclerosis, as some early news reports had speculated, and stressed that there was no evidence of any risk of illness from consuming pork products.

“All of the information we have to

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date indicates that the general public is not at increased risk for developing this type of illness,” said Minnesota Commissioner of Health Sanne Magnan, MD, PhD, in a news release. “Also, there is no evidence that the food supply has been affected.”

Two workers were hospitalized, including one who stayed on for subsequent rehabilitation. Symptoms appeared over several weeks to months, characterized by muscle weakness, paresthesias — especially in the legs — and chronic fatigue with a sudden onset.

In most patients symptoms have been severe enough to limit many daily activities, according to Dr. Lachance, noting, for example, that many have difficulty managing stairs. Symptoms were first noted in one worker in a local soccer league when he could not continue playing. In some patients, sensory symptoms and discomfort in the neck, lower back, and limbs dominate the clinical picture,



Health officials say there was no evidence of any risk of illness from consuming pork products.

while in others, mild to moderate weakness can be demonstrated on the neurologic examination. Treatment has generally consisted of observation in milder cases, while the more severely affected have been treated with steroids or in-

travenous immunoglobulins.

NO CAUSES IDENTIFIED

At press time, the Minnesota state health department had not identified a cause of the illnesses. Investigators had interviewed all 12 patients, as well as workers who worked in the same area and those who did not, collecting information on work history, medical history, potential exposures, and other topics. Clinical specimens, including throat swabs and blood, were obtained from 90 percent of those interviewed and evaluation for possible infectious agents is ongoing.

All of the cases involved people who worked in an area where swine heads are processed and brains are removed. No workers in any other parts of the plant have had symptoms, said Dr. Lachance.

A compressed air system for cleaning out the brain cavities of processed swine

was introduced at the plant shortly before the first worker complained of symptoms, and there has been concern that the illness might have been caused by inhalation of aerosolized brain tissue or a microorganism associated with this mode of exposure.

The plant quickly stopped using the compressed air system and implemented other measures to protect workers in early December 2007, and as of press time, no new cases with symptom onset since the changes were made have been reported, according to Dr. Lachance.

Aerosolized blood and organ particulate in slaughterhouses and meat processing plants, referred to as “blood mist” in occupational safety circles, has long been recognized as a potential health risk and there are regulations for worker exposure in the Occupational Health Act. Even so, the symptoms do not match any known neurological illness that can be transmitted from animals to humans.

Exposure to chemical toxins at the plant has been ruled out as a cause. To date, no similar cases have been found in other states or elsewhere in Minnesota. State health department investigators are working with the CDC and alerting colleagues in the rest of the country to determine if cases are being seen in workers in other pork processing plants around the U.S.

“We’re still trying to define the illness, but all but two of the workers appear to have some type of inflammatory neuropathy with features of a sensory

Pork Plant, Neurological Illness

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polyneuropathy," said Dr. Lachance. Of great interest, the worker with the most intense exposure presented with a transverse myelitis in late 2006, improved after a period of rehabilitation, and a few months after returning to work developed the polyradicular pattern experienced by other workers. "This appears to be a specific syndrome. All of the workers have had at least one or more abnormalities on MRI, EMG, spinal fluid examination, or serological tests."

He noted that MRI shows contrast enhancement and in some cases enlargement of nerve roots in the cauda equina. Spinal fluid protein is elevated, sometimes quite significantly. EMG studies show prolonged motor distal latencies and F-wave latencies, occasional mild reduction of motor and sensory amplitudes, and generally mild denervation changes on needle examination.

"As it stands right now, we cannot be any more specific about the nature of

the serological findings, but as data continue to be analyzed, we expect to be able to provide more information in a published report in the future."

Because the workers were close to the brain removal area, concern was raised that the pig CNS might be the infectious vehicle. "But we do not know of any specific infectious or autoimmune disorder like this that is caused by exposure to animal tissue," Dr. Lachance said, adding the disorder could be an autoimmune response to an infection. "Transverse myelitis or a brachial plexopathy after a viral syndrome, Guillian-Barré syndrome associated with campylobacter infection are the most likely models, but to our knowledge, nothing like this has ever been encountered before."

NEUROLOGISTS' HELP NEEDED

"This is an unusual occurrence," said Ruth Lynfield, MD, state epidemiologist for the Minnesota Department of Health. "We are working with the Austin plant and partners in public health, environmental

health, medicine, veterinary medicine, agriculture, and the swine industry to determine the cause."

Because the illness is so unusual, Dr. Lachance is specifically asking neurologists to come forward with any information that might help explain the epidemic.

"We would like to communicate to all neurologists that we need their help to solve this problem," he said. "We want to know whether there have been other cases anywhere in the country. We want to talk to neurologists who have had any patients with inflammatory neuropathies who worked in pork processing plants. Why this plant? Why these workers? Why now? We really need to be able to answer these questions."

Any neurologist with information can contact Dr. Lachance at the Mayo Clinic, by phone (507-284-5005) or e-mail lachance.daniel@mayo.edu. Neurologists can also contact the Minnesota Department of Health Infectious Disease Epidemiology, Prevention and Control Division, 651-201-5414/5797. ■



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