INFO & RESEARCH EXCHANGE

Green Tobacco Sickness

Harvesting burley tobacco during the hot, humid months of late summer and early fall creates a risk of green tobacco sickness (GTS). GTS or nicotine poisoning occurs when nicotine is absorbed through the skin of tobacco workers. This dermal absorption occurs when the workers come in contact with wet green tobacco. Wet clothing contaminated with nicotine during the early morning may continue to dose the worker with nicotine throughout the day.[1]

Nicotine, a liquid alkaloid, is readily absorbed from the gastrointestinal tract, respiratory mucous membranes, and skin, and is freely soluble in water.[2] Nicotine exerts an effect across multiple systems and is dose related. In small doses, nicotine exerts a stimulating effect on the medullary centers of the central nervous system and on the peripheral nervous system; larger doses cause depression of these systems.[2]

During the past decade, GTS has gained notable attention as a preventable occupational illness. The incidence rate for GTS has not been established because the illness is usually self-limiting and does not require medical treatment. However, researchers did identify 47 persons seeking emergency department treatment for GTS in a five-county area of Kentucky during a 2-month period in 1992.[3]

Risk Factors

Individuals working with wet tobacco without wearing protective clothing are at risk for GTS. The worker's clothing becomes saturated from the wet tobacco or the tobacco comes in direct contact with the skin, creating the perfect situation for dermal absorption of the nicotine.[3] Being under age 30 years was determined to be a risk factor in a 1993 case-control study. The reduced risk of GTS among older workers may be the result of strategies they have initiated over time to decrease their exposure to this toxic agent.[4]

Symptoms

Symptoms associated with GTS are nonspecific [2,5-8] (Table 1). Because of nicotine tolerance, smokers may experience less intense symptoms from nicotine exposure than nonsmokers.[5] Symptoms develop within 3 to 7 days after exposure to nicotine. Less severe cases subside in 12 to 24 hours after onset. If the symptoms are severe or continue past the expected duration of 24 hours, the worker should seek medical attention.[5]

Differential Diagnosis

The health care provider must be able to distinguish the clinical manifestations of GTS from the signs and symptoms of organophosphate (pesticide) poisoning, heat disorders, and gastroenteritis. Most GTS cases develop during the hot, humid months of July, August, and September.

Heat exhaustion and heat stroke can be ruled out because the worker's temperature is not elevated and the symptoms of GTS occur at the end of the day after the worker is no longer exposed to extreme temperatures. The symptoms of GTS are similar to those of organophosphate poisoning. However, organophosphate insecticides are not used on tobacco during the last month before harvest.[3] The health care provider must base the differential diagnosis on the worker's occupational history, the presenting signs and symptoms, and physical assessment findings.

Treatment

Symptomatic treatment and measures that will stop the dermal absorption of nicotine are needed. Initial treatment should include showering to remove nicotine from the skin and changing into clean, dry clothes. Additionally, intravenous fluids and antiemetics may be needed.[1,7]

Prevention

The ultimate aim is to prevent GTS from developing. All laborers who top, cut, or load green tobacco should be warned of the occupational hazard of GTS. Public service announcements on television and radio as well as newspaper articles assist in spreading the message. Another effective method is poster displays and brochures in locales where workers congregate (farm service agency, farm meetings, country stores). In addition, nurse practitioners can assist by disseminating information regarding

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Table 1.[2,5,8]
Signs and Symptoms Associated with GTS

Common Signs and Symptoms
Nausea
Vomiting
Dizziness
Weakness
Other Clinical Manifestations
Diarrhea
Changes in heart rate and blood pressure
Abdominal Cramps
Headaches
Dyspnea

prevention, treatment, and follow-up.

Additionally, workers must avoid or minimize exposure to wet tobacco. Delaying work with tobacco after rain or in the early morning when the dew is heavy is an excellent preventive practice. Protecting the skin from the toxic agent by wearing protective clothing such as gloves, boots, and long-sleeve shirts and long pants is also a preventive strategy.[9,10] If clothing becomes wet, workers should change into dry clothing and remember to shower immediately after leaving the tobacco field.[1,3] Wearing waterproof clothing would appear to be the perfect barrier to prevent the exposure to nicotine; however, this strategy can cause severe heat-related disorders due to the impermeable nature of waterproof clothing.

Impact of Green Tobacco Sickness

The economic impact of GTS on the tobacco grower is staggering. The grower suffers not only from costly medical treatment of employees but also from lost work time. One study reported that the average cost to treat GTS was $250 for outpatient services, $566 for hospital admission, and $2,041 for intensive care treatment.[3]

Recommendations for research include investigating the impact of GTS on persons with preexisting chronic diseases, women, children, and the elderly. Health care providers, tobacco workers, and growers must collaborate to develop and implement creative strategies to prevent this occupational illness.

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