Changing Epidemiology of Murine Typhus in Texas

Jennifer A. Shuford, M.D., M.P.H., 1 Patrick Hunt, B.S., 2 Bonny Mayes, M.A., R.Y.T. 2

1 Texas Department of State Health Services, Laboratory and Infectious Disease Services, 2 Zoonosis Control Branch

Abstract

Background: Murine (also known as flea-borne) typhus is uncommon in the U.S. but is considered endemic in the southernmost parts of Texas. It is caused by Rickettsia typhi, which is transmitted to humans by rat and cat fleas. Murine typhus is often a mild illness with nonspecific clinical findings, though delayed treatment may result in severe disease and increased risk of complications. Diagnostic tests lack sensitivity in early disease. Therefore, correctly diagnosing patients with murine typhus is challenging unless clinical suspicion is high. In endemic regions, physicians are aware of the disease and diagnosis is readily however, in areas that have not historically been affected, physicians may be less familiar with the presentation of this rickettsial infection.

Methods: Probable and confirmed murine typhus cases reported in Texas were collected for 1944-2017. Cases were mapped by county for each of the last 5 years. Cases reported over the last 5 years were also geocoded by residence for spatial cluster analysis by year.

Results: There has been an overall rise in the number of murine typhus cases reported per year over the last 15 years. The distribution of reported cases throughout Texas has changed over the last 5 years. There continues to be a high number of reported cases in South Texas and Central Texas, while reported cases are increasing in Harris County, Tarrant County, and Dallas County. Spatial cluster analysis of typhus cases over the last 5 years shows areas of increased risk in South Texas that have persisted over time, while other areas of increased risk have appeared more recently in North Texas and Central Texas.

Conclusions: Murine typhus can be a difficult diagnosis to make based on clinical presentation, and physician awareness of its epidemiology is important. The gradual increase in case counts and the changing distribution of cases within Texas may put patients at risk of missed diagnoses. Recognizing the changing epidemiology of typhus in Texas may help inform public health education and control efforts.

Background

• Murine typhus is uncommon in the U.S. but has been present in Texas for many years (fig. 1). 1-3
• It is endemic in some parts of Texas.
• Murine typhus is caused by Rickettsia typhi.
• Organism is transmitted by rat and cat fleas.
• Reservoirs include rats, opossums, cats, and dogs. 4
• Typhus is often a mild, self-limited illness, but delayed treatment may lead to severe disease.
• Up to 70% of reported cases are hospitalized. 4
• Mortality ranges from 1-5%, depending on treatment availability. 5-5
• Diagnostic tests lack sensitivity in early disease. 5
• Physician awareness is important for accurate and timely diagnosis.

Methods

• Probable and confirmed cases of murine typhus reported in Texas were collected for 1944-2017.
• Cases were mapped by county for 2013-2017.
• Cases from 2013-2017 were geocoded by residence for spatial cluster analysis by year.

Results

• Reported murine typhus cases in Texas have increased over the last 13 years (fig. 2).
• The distribution of cases throughout Texas has changed over the last 5 years (fig. 3, 4).
• Spatial cluster analyses show persistent areas of increased risk of typhus in South Texas, with areas of increased risk recently emerging in Central Texas and North Texas (fig. 5, 6).

Limitations

• Analyses rely on data from passive surveillance. Physicians, laboratories, and health care facilities are required to report cases of rickettsiosis to local or regional health departments in Texas, but the data are often incomplete.
• Analyses include confirmed and probable cases. However, many cases of suspected typhus in Texas are treated empirically without laboratory evidence of typhus, and thus are not reported.

Conclusions

• Case counts and distribution of cases of murine typhus in Texas are increasing.
• Because accurate and timely diagnosis and treatment of murine typhus reduces complications and mortality, physician awareness of the clinical presentation and effective treatment of murine typhus is important in Texas.
• Geographic analysis of murine typhus cases can help inform public health interventions, including educational campaigns and vector/reservoir control measures.

References