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A Commentary on Acute Hepatitis E Infection: A Zoonotic Infection from Deer

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About the Study

Acute Hepatitis E Virus (HEV) infection continues to be a major health burden with approximately an estimated 20 million HEV infections worldwide leading to 3.3 million symptomatic cases and 44000 deaths in 2015. It accounts for 3.3% of mortality due to viral hepatitis [1]. HEV can cause acute hepatitis with hepatocellular damage and there have been reported cases of chronic HEV [2]. Infection can lead to fulminant liver failure and death in pregnant women [3]. Although HEV is primarily transmitted through fecal-oral route from contaminated water, zoonotic infection has been reported. In this issue of the Journal of infectious disease and therapy, Akpoigbe et al. report the zoonotic transmission of HEV from deer to human.

HEV infection and transmission from deer

Different genotypes of HEV have been reported to infect animals as well as humans. While genotypes 1 and 2 are primarily human infection found in developing countries in Asia and Africa, 3 and 4 infect humans and many animal species around the world [4]. Genotypes 1 and 2 transmissions is mainly found in developing countries from poor sanitary conditions with water outbreaks accounting for most infection. Contrarily, in Japan, Europe, and North America, where genotypes 3 and 4 account for HEV infection, the main route of transmission is meat consumption [4]. Nevertheless, reported transmissions have been reported from meat slaughterers [5]. Several reservoirs of HEV infection in animals include swine, boars, and deer. Tei, et al., reported the zoonotic transmission of hepatitis E virus from deer to humans among people who had eaten uncooked wild Sika deer meat. Genetic sequencing and cluster identification of viral sample from a sample on the left of the consumed meat and the human HEV isolate confirmed genotype 3 [6]. Also, consumption of uncooked deer meat has been reported as a risk factor for HEV in a case control study which showed significantly elevated HEV IgG levels in subjects who ate raw dear meat [7]. While no genetic analysis was done in this case control study, the temporal association of HEV seroprevalence was significant for consumption of raw deer meat when compared with the controls. We reported a case of HEV in the U.S.A from the butchering of deer meat [8]. This was found in a native American who slaughtered about 5 deer and presented with symptoms and serological markers consistent with acute HEV infection. While consumption of undercooked or raw deer meat has been established as a route of transmission, Slukinova et al noted there is a high risk of contracting HEV infection in persons who had exposure to infected animals especially for slaughterers [5]. One limitation in both studies was the missing genotype(s) of the HEV involved. As such there was no evidence to corroborate both studies with the more prevalent genotypes 3 or 4 that are usually associated with zoonotic infection. However, the temporal association between the two studies establishes HEV infection and deer meat. The majority of HEV infection is acute and self-limited infection lasting a few days to weeks characterized by abnormal liver enzyme elevation. Serum immunoglobulins are positive for HEV infection including IgM for the acute infective stage and IgG indicating recovering and immunity will be found. Few cases of HEV infection would result in death but usually often fatal in pregnant women who may likely develop fulminate acute liver failure.

Conclusion

Deer is an important reservoir and source HEV infections in North America. This is an important finding that should be capitalized on to improve greater public awareness and care when handling the animal. It should also inform clinicians to consider HEV infection earlier on in the treatment cascade for patients suspected of having viral hepatitis. This would help in early diagnosis of HEV infection and more accurate prediction of intervention and care.

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