Mad cow disease

Family

Madcow Disease Disease Mad cow disease is a fatal disease of the brain that is incurable and affects mainly cattle and other animals like sheep and goat (Wisniewski, 2005). It is the common name for bovine spongiform encephalopathy or BSE because the disease affects the nervous system of the cow making it act strangely and lose control to do normal things like walking. The disease is mainly contracted by animals. However, there is some evidence between BSE and a rare condition of the brain that affects humans known as variant Creutzfeldt-Jakob disease (vCJD) (Wisniewski, 2005). Individuals who eat beef prepared from cows suffering from BSE are at increased risk of developing madcow disease. Until 2009, only about 219 cases of the disease have been reported worldwide, most of which have occurred in Britain. The first case of BSE was detected in United States in December 2003 (Wisniewski, 2005). The previous occurrence in the world was seen in 1980s when there was was an epidemic in Great Britain and other European countries. People living in areas affected by the epidemic are not allowed to donate blood or organs. The first infections in cattle probably occurred in 1970s (CDC, 2011). According to CDC (2011), " there exists strong epidemiologic and laboratory evidence for a causal association between a new human prion disease called variant Creutzfeldt-Jakob disease (vCJD) that was first reported from the United Kingdom in 1996 and the BSE outbreak in cattle. The interval between the most likely period for the initial extended exposure of the population to potentially BSE-contaminated food (1984-1986) and the onset of initial variant CJD cases (1994-1996) is consistent with known incubation periods for the human forms of prion disease." Causative agent The main causative agent for vCJD is an abnormal protein known as prion. People suffering from vCJD a sponge like appearing

brain due to death of cells (Aucouturier et al, 2000). Gradual death of cells in the brain makes people lose their control both physically and mentally. The human form of madcow disease is known as variant Creutzfeldt-Jakob disease (vCJD) or new variant Creutzfeldt-Jakob disease (nvCJD). The classical disease, CJD was earlier identified among elderly people (Wisniewski, 2005). Prions are neither viruses nor bacteria, they are actually infectious proteins (CDC, 2011). Transmission Madcow disease is transmitted from animals to human through ingestion of beef. Human to human transmission is rare and can occur through cannabalism and tissue transplantation. Transmission of infection can occur even in preclinical stage (WHO, 2002). Manifestations The incubation period of the disease is long and lasts for several years. Symptoms begin to appear only when critical levels have reached in the brain. Some early symptoms include dementia, depression and difficulty in walking. These symptoms progress rapidly and gradually. Other important early symptoms include trouble sleeping, anxiety, worsening memory, withdrawal, unsteady gait and muscle spasms. The clinical presentation is atypical. Sensory and psychiatric symptoms are prominent and neurological abnormalities are dementia, ataxia and diffusely abnormal electroencephalogram that is non-diagnostic (Wisniewski, 2005). Pathology The prions settle in spinal cord, brain, retina and other nervous tissues of animals and humans. rarely, they can also be found in spleen, bone marrow and lymph nodes. In some cases, low levels of prions can be found in blood too. Prions eat the tissue of the brain and create sponge like holes in several parts of the brain. These holes cause slow deterioration and contribute to loss of control symptoms of the cattle and the humans. This is eventually followed by death. The nature of prion is not well understood. The

most accepted theory is that prion is a modified form of normal protein (CDC, 2011). Treatment and prevention As of now, there is no treatment or vaccine for prion diseases, including madcow disease. There is no specific diagnostic test for madcow disease. However, tests need to be performed because other differential diagnoses need to be ruled out. These include complete blood picture, liver function tests, blood culture, thyroid function tests, blood levels for folate and vitamin B-12, tests for sexually transmitted diseases, and HIV. Important imaging studies include PET scan, MRI and EEG. Spinal tap may be done to rule out meningitis. Brain biopsy is rarely done and does not have much role (Wisniewski, 2005). Main treatment is supportive. Drugs which affect memory and cause confusion must be stopped. Death is mandatory and can occur in 8 months after onset of symptoms (Wisniewski, 2005). Main prevention strategy is to resort to vegetarian diet. A non-vegetarian may avoid beef products. Blood transfusion and organ donation in affected areas must be avoided. Milk and milk products however, do not seem to transmit the disease (Wisniewski, 2005). References Aucouturier, P., Carp, R. I., Carnaud, C., Wisniewski, T. (2000). Prion diseases and the immune system. Clin Immunol. Aug., 96(2), 79-85. CDC. (2011). BSE (Bovine Spongiform Encephalopathy, or Mad Cow Disease). Retrieved from http://www. cdc. gov/ncidod/dvrd/bse/ WHO. (2002). Bovine spongiform encephalopathy. Media center. Retrieved from http://www. who. int/mediacentre/factsheets/fs113/en/ Wisniewski, T. (2005). Madcow disease. Retrieved from http://www. emedicinehealth. com/mad_cow_disease_and_variant_creutzfeldt-jakob_dis/page11_em. htm