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Bovine Cysticercosis and Hospital Based Retrospective Survey of Human Taeniasis in and around Debre Brihan City, Central Ethiopia

Andualem Yimer* and Belayneh Mergia

Gebrmedehan School of Veterinary Medicine, Wollo University, Dessei, Ethiopia

INTRODUCTION: Tapeworm and cysticercosis are parasitic meat-borne infections that are important to public health and the global economy. Tapeworm is the intestinal infection of humans, through the adult stage of cestodes of the genus Taenia. The main cestodes that are important for causing tapeworm in humans, which act as the natural end hosts of these tapeworms, are Taenia solium, Taenia saginata and Taenia asiatica. The main risk factor that supports the transmission of the disease is the unsanitary disposal of human excrement and the consumption of raw or undercooked beef or pork. Cysticercosis is a tissue infection of the intermediate hosts of band worms caused by the ingestion of Taenia eggs. Cattle serve as an intermediate host for T. saginata and cysticerci only develop in beef, while those of T. solium and T. asiatica in the visceral organs of pigs. The eggs of these ribbon worms are lost or in the proglottids excreted with the faces of the infected final host to the external environment. When ingesting infectious eggs, intermediate hosts / cattle become infected and develop larval stages of metacestodes (also called cysticerci), resulting in bovine cysticercosis. People get tapeworm after eating undercooked beef containing viable cysticerci. Taenia saginata is a parasitic infection of humans residing in the small intestine of infected humans. T. saginata is considered to be distributed worldwide, it is widespread in developing countries, especially in Africa, Latin America, the Caucasus, Asia and the countries of the eastern Mediterranean. In these countries where hygienic conditions are associated with poor cattle management practices and the lack of strict meat inspection due to the common habit of slaughter in backyard. Although the prevalence of the disease is very low in developed countries, public health and the economic importance of T. saginata is considered a re-emerging zoonosis in previously disease-free areas due to the migration of infected people and livestock exchanges. Bovine cysticercosis was a foodborne parasitic zoonosis caused by the larval stage of the tapeworm Taenia saginata commonly known as beef tapeworm. It was difficult to diagnose in live animals, but if the animal was heavily infested, cysts could be felt on the tongue and face. The majority of cases were identified during visual slaughter inspection, with samples sent to a laboratory for confirmation. If confirmed, the meat would be destroyed or frozen to inactivate the cysts and prevent transmission to humans. Prevention and control methods should aim to avoid or reduce the risk factors associated with the transmission of tapeworm and cysticercosis. Measures used in the fight against tapeworm and cysticercosis include diagnosis and treatment of Taenia carriers, mass education to use latrines, avoid consumption of raw meat and post-mortem inspection of carcasses for presence of Cysticercus bovis. The cultural aspects of a certain community towards cooking and eating habits are some of the factors responsible for the spread of T. saginata infections. This unhygienic practice by the population of the country has a great contribution to the spread of bovine cysticercosis in the communities. In Ethiopia, human tapeworm is a common infection linked to the common practice of eating raw or undercooked beef in many sections of the country's human population. Blind defecation, due to the lack of latrines, is a common practice, especially in the rural community of Ethiopia where more than 80% of the population resides. The traditional farming practices common in Ethiopia (free grazing of cattle) mainly allow the free access of cattle to the contaminated environment and perpetuate the transmission of cysticercosis, since cattle are infected by the ingestion of pasture / feed for animals or water contaminated with T. saginata eggs. The prevalence of human taeniasis due to T. saginata was reported in different regions of Ethiopia with range of 27.5% [12] to 70% based on questioner survey. T. saginata/C. bovis prevalence has been recorded from different regions and charted cities of Ethiopia: at Addis Ababa abattoir by Kebede et al.; in Southern Ethiopia by Regassa et al. , Northern Ethiopia by Getachew and Getachew and Ashiwani ; in Awassa municipal abattoir (Southern Nations' Nationalities' Peoples' Region) by Abunna et al. , in northwestern Ethiopia by Kebede. The questioner based survey revealed a higher prevalence of T. saginata infection than the hospital based studies, however questioner based survey result did not show the actual infection in the community. The hospital based studies are important to estimate the actual prevalence of T. saginata infection in the community. Moreover, patients who visited referral hospital came from different districts of north showa zone, in the central region of Ethiopia, our hospital based study may provide insight in to the region-wide distribution of T. saginata as well as other epidemiological data. Obtaining epidemiological data of a certain disease is essential before planning and implementation of control programs. Information resulting from hospital records has been taken as useful sources of data for the study of the actual distribution and epidemiological aspect of T. saginata. Therefore, this study was conducted to determine the prevalence of bovine cysticercosis and cyst characterization in view of its public health implication in the study abattoir and another objective was to evaluate the prevalence and possible trends of human T. saginata in and around Debre Birhan town based on hospital data over a period of 5 years [19]. MATERIALS AND METHODS The study area The study was conducted in Debre

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Brihan town, Amhara Regional State, which is located at 130 km northeast of Addis Ababa. The study area geographically located at latitude 090 31/N and longitude 390 28/E. The area is plateau and found in central Ethiopia at an altitude of 2780 m a.s.l. It has mean annual rain fall of about 956 mm of which 84% falls during the long rainy season that extends from June to September and the remaining is during the short rainy season that extends from October to May. The mean annual minimum and maximum temperatures are 5.3°C-17.8°C; 9°C and 24°C, respectively and the mean relative humidity is about 75% [20]. Extensive management system was dominant, while semi intensive husbandry system of cross breed dairy cattle was rarely practiced. Study design and study population A cross sectional study was carried to determine the prevalence of bovine cysticercosis. The breeds of the study animals were the indigenous zebu cattle and cross breeds of zebu with HolsteinFriesian. The study animals were indigenous zebu and exotic cross breed cattle brought at Debre Birhan municipal abattoir in Debre Brihan town for slaughtering, from different localities during the study period. Most of the slaughtered animals were male cattle originated from different localities mainly from market origins of Shewarobit, Jiru, Chacha, Debre Birhan, Ankober and Kotu districts of north Shewa zone, Central Ethiopia. During sampling of the study animals in the study time, sex, breed, origin, ages and body conditions of all the sampled animals from the study area was recorded for the assessment of risk factors.