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Non Tuberculous Mycobacteria in Swine: Is it a Public Health Problem?

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The importance of infections caused by non-tuberculous mycobacteria (NTM) in animals and humans has gained considerable recognition during the past few years. Unlike the members of *Mycobacterium tuberculosis* complex (MTC) that are highly pathogenic, majority of the NTM have been regarded as non-pathogenic. This opinion is now changing as more NTM are associated with disease [1]. *Mycobacterium avium* subspecies *avium* and *hominisuis* belong to a much wider group of non tuberculous mycobacterium (NTM) called *mycobacterium avium* complex (MAC) [2]. This group is reported to be the most frequently encountered form of NTM in the Western world. Its members have a wide range of sources including water, soil, animal beddings, domestic and wild animals [3-5]. At the beginning of the AIDS pandemic, Non-Tuberculous Mycobacteria (NTM) were reported as emerging pathogens responsible for opportunistic infections, found in most HIV/AIDS infected patients, especially those with CD4 cell counts B/100/ml [6]. Currently, it is estimated that 50% of the AIDS patients are likely to develop MAC complex, predominately *M. avium* if their CD4 count is below 50 [2]. The other species documented to cause opportunistic human infections are *; Mycobacterium avium, M. intracellulare, M. kansasii, M.paratuberculosis, M. scrofulaceum, M. simiae, M. habana, M. interjectum, M. xenopi, M.heckeshornense, M. szulgai, M. fortuitum, M. immunogenum, M.chelonae, M. marinum, M.genavense, M. haemophilum, M. celatum, M. conspicuum, M. malmoense, M. ulcerans, M.smegmatis, M. wolinskyi, M. goodii, M. thermoresistible, M. neoaurum, M. vaccae, M.palustre, M.elephantis, M. bohemicam, M.conceptionenseand M. septicum* [7-9]. It is however difficult to accurately describe the situation in Sub SaharanAfrica and other developing countries since most of the data on which these inferences are made comes from Europe or North America.

Swine tuberculosis is a chronic infectious disease characterized by inflammatory reactions in various body parts but mostly in the digestive system. Calcification prone tubercles, inflamed lymph nodes and sarcoid-like granulomas are the most common features of this disease [4,5,10]. The lesions are generally small foci 1 to 10mm in diameter which are unlikely to cause detectable clinical signs in the pigs. In additions cases may also develop milliary lesions along the course of the lymphatic system especially if infected by *M.avium* complex. These lesions are however most detectable at slaughter which result into financial losses. These economic losses primarily result from condemnation of pork, head and visceral organs at inspection [11,12]. The following have been isolated from infected pigs; *M. bohemicum, M. intracellulare, M. avium, M. hemophilum, M. malmose, M. szulgai, M. kansasii, M. scrofuleceum,M. tuberculosis, M.simiae, M. palustre, M. gordonae, M. terrae, M. xenopi and M. heckershornense* [5,13]. Reports from Czech Republic indicated that outbreaks in herds have been due to contaminated peat, compost and saw dust [11] while in Nigeria it is reported that swine are mainly infected by ingestion of soil, litter, dust contaminated by faeces of tuberculous chicken or consumption of improperly processed infected chicken [4].

The absence of documented human to human and animal to human transmission in the last 30 years has led to theconclusion that the environment is the source of NTM for human, however there is growing evidence that food of animal origin could be the source of these infection to human [1,4,14]. In Netherland [12] showed a close genetic relatedness between *M. avium*subsp. *Hominissuis* isolated from swine and humans. Since then many scholars have continued to document more evidence re-affirming the rolepigs could be playing in the transmission of mycobacterial infections to immune compromised and immune competent individuals. In 2007, Oloya et al. isolated *M. avium* subsp. *Hominissuis* from tuberculous lesions in cattle and T.B patients with cervical lymphadenitis in pastoral areas of Karamoja in Uganda. The molecular findings too showed a very high genetic relatedness between animal and human isolates [15]. Although the true source of human infection isstill a matter of dispute, these findings tend to point us to zoonotic scenario. Diagnostics and early detection are believed to be the greatest public health hindrance in sub Saharan Africa and many developing countries, as infection are mostly detected at slaughter, at which point food safety is outweighed by food security.

The relative importance of mycobacterial diseases has indeed been evolving over the past few years, and new challenges are expected to overwhelm the available prevention, control and surveillance strategies. The growing evidence that swine could be playing a role in dissemination of NTM is of public health concern especially in developing countries where HIV/AIDS is more prevalent.

References

1. Falkinham JO 3rd (2009) Surrounded by mycobacteria: Nontuberculous mycobacteria in the human environment. J Appl Microbiol 107: 356-367.
2. AIDSINFONET (2011) Mycobacterium Avium Complex (MAC) Fact sheet 514 accessed 04. February 2012.
3. Krizova K, Matlova L, Horvathova A, Moravkova M, Beran V, et al. (2010) Mycobacteria in the environment of pig farms in the Czech Republic between 2003 and 2007. Veterinarni Medicina 55: 55-69.
4. Ofukwo RA, Iortyom BK, Akwuobu CA (2010) Mycobacterium avium and Mycobacterium intracellular Infections in Slaughtered Pigs in Makurdi, North-Central Nigeria: An Emerging Zoonosis. Int J Anim Vet Adv 2: 43-46.
5. Cvetnić Ž, Špićić Š, Benić M, Katalinić JV, Mateja P, et al. (2007) Mycobacterial infections of pigs in Croatia. Acta Vet Hung 55: 1-9.
6. Masur H (1993) Recommendations on prophylaxis and therapy for disseminated Mycobacterium avium complex disease in patients infected with the human

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immunodeficiency virus. Public Health Service Task Force on Prophylaxis and Therapy for Mycobacterium avium Complex. N Engl J Med 329: 898-904.

7. Katoc VM (2004) Infections due to non-tuberculous mycobacteria (NTM). Indian J Med Res 120: 290-304.
8. Griffith DE, Aksamit T, Brown-Elliott BA, Barbara A, Catanzaro A, et al. (2007) An Official ATS/IDSA Statement: Diagnosis, Treatment, and Prevention of Nontuberculous Mycobacterial Diseases. Am Thoraci Soc 175: 367-416.
9. Shojaei H, Hashemi A, Heidarieh P, Ataei B, Naser AD (2011) Pulmonary and extrapulmonary infection caused by Mycobacterium conceptionense: the first report from Iran. JRSM Short Rep 2: 31.
10. Coetzer JAW, Tustin RC (2004) Infectious Diseases of livestock. Oxford University press 3: 1973-1987.
11. Matlova L, Dvorska L, Ayele WY, Bartos M, Amemori T, et al. (2005) Distribution of Mycobacterium avium complex isolates in tissue samples of pigs fed peat naturally contaminated with mycobacteria as a supplement. J clin microbiol 3: 1261-1268.
12. Komijn RE, de Haas PE, Schneider MM, Eger T, Nieuwenhuijs JH, et al. (1999) Prevalence of Mycobacterium avium in slaughter pigs in The Netherlands and comparison of IS1245 restriction fragment length polymorphism patterns of porcine and human isolates. J Clin Microbiol 37: 1254-1259.
13. van Ingen J, Wisselink HJ, van Solt-Smits CB, Boeree MJ, van Soolingen D (2010) Isolation of mycobacteria other than Mycobacterium avium from porcine lymph nodes. Vet Microbiol 144: 250-253.
14. Muwonge A, Kankya C, Godfroid J, Djonne B, Opuda-Asibo J, et al. (2010) Prevalence and associated risk factors of mycobacterial infections in slaughter pigs from Mubende district in Uganda. Trop Anim Health Prod 42: 905-913.
15. Oloya J, Kazwala R, Lund A, Opuda-Asibo J, Demelash B, et al. (2007) Characterisation of mycobacteria isolated from slaughter cattle in pastoral regions of Uganda. BMC Microbiol 7: 95.