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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 *hominissuis* 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.conceptionense* and *M. septicum* [7-9]. It is however difficult to accurately describe the situation in Sub Saharan Africa 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. scrofulaceum*, *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 the conclusion 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 role pigs 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 is still 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.

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