

Mycobacterium caprae – the first case of the human infection in Poland

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Abstract

The strain of tuberculous mycobacteria called *Mycobacterium caprae* infects many wild and domestic animals; however, because of its zoonotic potential and possibility of transmission between animals and humans, it poses a serious threat to public health. Due to diagnostic limitations regarding identification of MTB strains available data regarding the incidence of *M. caprae*, human infection does not reflect the actual size of the problem. Despite the fact that the possible routes of tuberculosis transmission are known, the epidemiological map of this zoonosis remains underestimated. The progress in diagnostic techniques, application of advanced methods of mycobacterium genome differentiation and cooperation between scientists in the field of veterinary medicine and microbiology, have a profound meaning for understanding the phenomenon of bovine tuberculosis and its supervise its incidence. This is the first bacteriologically confirmed case of human infection of *M. caprae* in Poland.

Key words

bovine tuberculosis, *Mycobacterium bovis*, *Mycobacterium caprae*, zoonosis

INTRODUCTION

Among the members of *Mycobacterium tuberculosis* complex (MTBC), tuberculosis (TB) in humans is mainly caused by *M. tuberculosis*, while bovine tuberculosis (bTB) results mostly from infection with *M. bovis* detected in wild and domestic mammals [1]. Since bovine mycobacteria causes clinical, radiological and pathological symptoms similar to *M. tuberculosis*, these strains can be distinguished only using special diagnostic techniques, such as culture, strain identification based on the biochemical and morphological features, and genotyping. Until recently, one of the criteria for differentiation of *M. bovis* was also resistance to pyrazinamide (PZA); however, PZA-susceptible strains of *M. bovis* have been described. As a consequence, *M. bovis* was split into two subspecies: *M. bovis* subsp. *bovis*, which showed resistance to PZA, and *M. bovis* subsp. *caprae*, which was sensitive to PZA. *M. caprae* has been identified in several European countries, including Spain, Austria, Italy, Croatia and Germany, and it is not solely restricted to the caprine host; *M. caprae* has been isolated from sheep, red deer, cattle, wild boar, from humans and captive animals, such as the Siberian tiger, camel and bison [2–11]. To-date, in Poland, *M. caprae* has been identified in cattle and wild animals, but until now no such case has been documented in humans [12]. As described, Polish strains classified as *M. caprae* and *M. bovis* have not acquired environmental resistance. *M. caprae* strains revealed sensitivity to all anti-mycobacterial drugs tested, and *M. bovis* isolates showed natural resistance only to PZA [13].

MATERIALS AND METHOD

In November 2012, a 46-year-old male was admitted to the pulmonology department in one of the district hospitals in the Silesian Province of south-western Poland. The patient was cachectic, in a weak general condition, with dyspnea and dysarthria. In the last six months he had lost 12 kg of body weight and had a severe cough with haemoptysis. The patient was living alone, had been unemployed for 20 years, living on pension and had been a smoker for many years. Psychiatric consultation revealed organic disorders caused by chronic alcohol abuse. The man denied that he has had tuberculosis in the past or contacted a sick person with TB. Basic laboratory testing of blood and urine was performed, as well as chest X-ray and tuberculin test. Sputum was sampled for bacteriological testing. Identification of the grown strain was performed with molecular testing (GenoTypeMTBC, Hain Lifescience). Drug sensitivity was determined with the genetic method GenoTypeMTBplus/sl (HainLifescience) and on LJ medium, according to the methods used in all laboratories for mycobacterium in Poland. Genomic DNA was isolated using hexadecyltrimethylammonium bromide [14]. Genotyping of the strain was carried out according to the described methodology, using spoligotyping [15].

RESULTS AND DISCUSSION

In most developed countries, including Poland, after the introduction in the middle of the last century of means for controlling tuberculosis, the threat of bovine tuberculosis in human decreased significantly [1]. The simultaneous implementation of appropriate eradication and surveillance programmes has resulted in the fact that in 2009 Poland obtained the status of being free from this zoonotic disease.

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