Epidemiology of mycobacteria infections in Basilicata, Italy: 1999-2012

Leonardo Buono, Giuseppe Montesano

Madonna delle Grazie Hospital, Matera, Italy

Summary

This short note describes the epidemiology of mycobacteria related infection through laboratory data in the region of Basilicata (Southern Italy) over a period of 13 years from 1999 to 2012. A total of 14,255 clinical specimens have been evaluated, showing 370 positive identification (84% *M.tuberculosis* complex and 16% non-tuberculosis mycobacteria).

Introduction

The availaibility of an efficacious laboratory diagnosis is the bottom line to achieve an effective control of mycobacteria related infections.

The Basilicata Region (Southern Italy) started in 1999 a specific regional project to implement a regional reference centre for diagnosis of mycobacteria infection in the Centro di Medicina Sociale per le Malattie dell'Apparato Respiratorio, ASL 4 of Matera. Later on, in 2002, this centre was transferred to the Ospedale Madonna delle Grazie of ASL 4 of Matera, This laboratory participated in many National diagnostic activities including the SMIRA (Studio Multicentrico Italiano Resistenze Antibiogramma - Italian Multicentric Study on Antibiogram Resistance) project and in the external quality control activities managed by ISS (Istituto Superiore di Sanità) (1,8)

This laboratory had since the beginning of its activity available the basic resources for the diagnosis, including microscopy, culture based tests alongside with the biochemical identification of species. Specific antimicrobial sensitivity tests and gene amplification were also available (7,8, 10,11).

The aim of this report is to describe the overall data collected over 13 years in Basilicata.

Correspondence: Leonardo Buono, Clinical Pathology and Analysis Laboratory, "Madonna delle Grazie" Hospital, Via Montescaglioso 75100 Matera, Italy.
Tel.: +39.328.0088376.
E-mail: leobuono@alice.it

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Materials and methods

From 1999 to 2012 a total of 14,255 samples of pathological materials were examined (Table 1). The microscopic examination and the culture tests were performed using standard methods (8). The gene amplification was carried out using a Strand Displacement Amplification (SDA) technology. This method was also used in samples of extra-pulmonary origin, even if aware that this technique is not completely validated of non respiratory specimens.

From 1999 to 2005 the identification of Non-Tuberculous Mycobacteria (NTMs) was outsourced to the reference Centre for Mycobacteria in Tuscany were a high-performance liquid chromatography (HPLC) was applied. From 2006 onward this diagnosis has been directly performed by *hsp65* gene sequencing (9,10).

The antimicrobial sensitivity testing was determined for streptomycin (SM), isoniazid (INI), rifampicin (RMP) and ethambutol (ETB), using the proportion method on solid medium until 2007, and thereafter by using the MGIT liquid medium method (Becton, Dickinson and Company, Milan, Italy) (4,13).

A total of 370 mycobacteria strains were isolated: 310 (84%) belonged to the *M. tuberculosis* complex and 60 (16.0 %) to the group of non-tuberculous mycobacteria. In Tables 1 and 2 are summarized the results. The results obtained for NMTs are indicated in Table 3.

Results

It is noteworthy that *M. paraffinicum* was isolated from one patient that has been previously treated for tubercolosis and that although treatment with second-line pharmaceuticals was maintained, *M. paraffinicum* was still isolated over at least 4 years after the stop of the specific tuberculosis therapy.

Three of the NTMs isolates were from foreigners citizens arrived in Italy less than 6 months before this diagnosis: two were not typeable and one was a *M. abscessus* isolate. *M. porcinum/septicum* was isolated from a patient suffering from pulmonary cancer (6,12).

The AST data obtained over the 13 years of the study clealrly showed that 79% (n.245) isolates of *M.tuberculosis* complex were sensitive to the common therapeutic agents whereas only 21% (n.65) showed a variable degree of resistance. Only 3 isolates (all obtained from respiratory biological samples were classified as MDR according to the current definition (2,3,5).

Conclusions

In conclusion, it can be stated that the centralization of the laboratory diagnosis for the mycobacteria related,

Table 1. Origin of samples.

Type of sample	N.	%
Sputum, bal, bas aspirates gastrico	9463	66.3
Genito-urinary materials	1886	13.2
Liquor	184	1.3
Cavitary fluids: pleu., peric., perit., synov.	2307	16.2
Purulent materials and aspirates	262	1.8
Miscellaneous materials (biopsies, blood, faeces)	153	1.1
Total	14,255	100

Table 2. Mycobacterium tuberculosis complex isolated in various materials (in parenthesis the number of isolated strains from Not-Italian patients).

Pathological materials	Autochthonous (foreign), n.	Total N.	Total %
Respiratory material	194 (41)	235	75.8
Genital-urinary material	24 (1)	25	8.1
Liquor	12 (0)	12	3.9
Cavitary fluids (pleu., peric., perit., synov)	11 (4)	15	4.8
Material and aspirates (gluteal pus from psoas abscess, intervertebral lymphoglandular and scrotal)	12 (3)	15	4.8
Biopsies	5 (1)	6	1.9
Various materials (faeces and blood)	2 (0)	2	0.6
Total	260 (50)	310	100

Table 3. Non-tuberculosis mycobacteria species and number of isolated strains.

M. avium	2	*M. kumamotonense*	1
M. chelonae/abscessus	5	*M. mucogenicum*	1
M. fallax	1	*M. paraffinicum*	1
M. fotuitum	1	*M. paratuberculosis*	2
M. gordonae	5	*M. porcinum/septicum*	3
M. houstonense/terrae	1	*M. thermoresistibile*	2
M. inje	1	*M. xenopi*	24
M. intracellulare	3	NOT typeable NTMs	2
M. kansasii	5	Total strains isolated	60

besides the possibility top draw a very comphensive epidemiological picture, has enabled to observe the presence of NTMs not identifiable by biochemical techniques giving evidence about the circulation of these bacteria also in Basilicata region.

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