

DESCRIPTIVE ANALYSIS OF NONTUBERCULOUS MYCOBACTERIA ISOLATED OVER A 5-YEAR PERIOD AT A GENERAL UNIVERSITY HOSPITAL

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Abstract:

Objectives. The frequency of the isolation of Nontuberculous Mycobacteria (NTM) is increasing in recent years in southern Europe, especially in patients with chronic lung disease, coinciding with a decrease in the cadence of tuberculosis (TB). The aim of this study was to describe the NTM isolated in a general university hospital serving an area of 400,000 inhabitants and analyze the associated epidemiological, clinical and microbiological factors.

Methods. In this retrospective study, MNT isolates were obtained over a 5-year period (January 2008 to December 2012) from our Microbiology database. Medical charts were reviewed for the following data: demographic, pulmonary and non-pulmonary diseases, presence of immunosuppression (HIV and non-HIV-related), site of disease, major symptoms at the time of sample collection, toxic habits, mycobacteriosis background and direct staining results. Case analysis definition: patients with more than one isolate of the same species were considered once, whereas those with isolates separated over time with more than one species were considered as different cases.

Results. 211 cases of MNT corresponding to 195 patients were analyzed. 183 (93.9%) had a single species and 12 (6.2%) had two or more (8 with 2 and 4 with 3). 121 (62.1%) patients were men. The mean age was 63.2 years (median 67, range 21-103). 92.9% of patients were Spaniards. Regarding toxic habits, smoking was reported in 47.9%; alcohol in 10.4%; other drugs in 7.1%; and unknown in 9.0%. Immune Status: 14.7% were HIV+, 30.3% had non-HIV-related immunosuppression (29.8% neoplasms, 4.3% post-transplant, 10.0% unknown). Pulmonary disease: 23.2% chronic obstructive pulmonary disease (COPD), 6.2% asthma, 28.4% bronchiectasis, 1.4% other pulmonary disease and 8.5% unknown. Diabetes was positive in 14.2% of cases. Previous mycobacteriosis was present in 18.5% of cases, 14.7% being TB and 3.8% NTM. Direct staining was positive in 5.2% of cases. The species distribution was as follows: 40.3% *Mycobacterium avium* complex (MAC), 13.3% *Mycobacterium gordonae* (MG), 4.7% *M. xenopi* (MX), 6.2% *M. kansasii* (MK), 1.4% *M. genavense* (MGe), 14.2% *M. chelonae-abscessus* complex (MCA), 10.9% *M. fortuitum* complex (MFC) and 9.0% other species. Localization was pulmonary in 88.2% of cases. Analysis by species showed: diabetes and COPD were more common in MAC; alcohol in MX; general symptoms in MK; HIV in MGe and in other species; and bronchiectasis in MCA. On dividing the analysis into two periods of 2.5 years more isolates of MAC and MFC were observed with a decrease in MCA and MG in the second period.

Conclusions. Most of the NTM isolates in our center were pulmonary and mainly observed in patients with pulmonary pathology, including a history of mycobacteriosis, and with some immunosuppression factors.

Objectives

The frequency of the isolation of Nontuberculous Mycobacteria (NTM) has been increasing during the last years in southern Europe, especially in patients with chronic lung disease, coinciding with a decrease in the incidence of tuberculosis (TB). The aim of this study was to describe the NTM isolated in a general university hospital serving an area of 400,000 inhabitants and to analyze the associated epidemiological, clinical and microbiological factors.

Methods

Retrospective study. NTM isolates were obtained over a 5-year period (January 2008 to December 2012) from the Microbiology Department database. Medical charts were reviewed, recording the following data: demographic, pulmonary and non-pulmonary diseases, immunosuppression (HIV and non-HIV-related), localization of disease, major symptoms at time of sample collection, toxic habits, previous Mycobacteriosis and sample staining results. Case analysis definition: patients with one or more NMT isolates during the study period. Second or third episodes with different species were considered as different cases.

Results

211 cases of MNT corresponding to 195 patients were analyzed. 183 (93.8%) had a single species and 12 (6.2%) had two or more (8 with 2 and 4 with 3). 121 (62.1%) patients were male. The mean age was 63.2 years (median 67, range 21-103). 92.9% of patients were Spaniards. Regarding toxic habits, smoking was reported in 47.9%; alcohol abuse in 10.4%; other drug use in 7.1%; and unknown in 9.0%. Immune Status: 14.7% were HIV+, 30.3% had non-HIV-related immunosuppression (29.8% neoplasms, 4.3% post-transplantation, 10.0% unknown). Pulmonary disease: 23.2% chronic obstructive pulmonary disease (COPD), 6.2% asthma, 28.4% bronchiectasis, 1.4% other pulmonary disease and 8.5% unknown. Diabetes was positive in 14.2% of cases. Previous Mycobacteriosis was present in 18.5% of cases, 14.7% being TB and 3.8% NTM (Table 1). Direct staining was positive in 5.2% of cases. The species distribution was as follows: 40.3% *Mycobacterium avium* complex (MAC), 13.3% *Mycobacterium gordonae* (MG), 4.7% *M. xenopi* (MX), 6.2% *M. kansasii* (MK), 1.4% *M. genavense* (MGe), 14.2% *M. chelonae-abscessus* complex (MCA), 10.9% *M. fortuitum* complex (MFC) and 9.0% other species (Figure 1). Localization was pulmonary in 88.2% of cases. Analysis by species showed (Table 2): diabetes and COPD were more common in MAC (23.0% and 34.2% vs. 11.4% and 19.3%); alcohol abuse in MX (33.3% vs. 10.4%); general symptoms in MK (85.7% vs. 45.2%); and bronchiectasis in MCA (81% vs. 49.1%). HIV was positive in 100% of MGe isolates. The percentage of HIV in the group including MAC, MX, MK, MGe, MCA and MFC was 31.8% vs. 12.7% in the remaining species. Other differences were not statistically significant. On dividing the analysis into two periods of 2.5 years, more isolates of MAC and MFC (30.4 and 7.0% vs. 52.1 and 15.6%, $p < 0.05$) were observed, while a decrease in MCA and MG (18.3 and 17.4% vs. 9.4 and 8.3%, $p > 0.05$) was found in the second period.

Conclusions

1. *M. avium* complex was the most frequent species, accounting more than one third of the isolates. 2. *M. chelonae-M. abscessus* were predominant among rapid growers. 3. Most of the NTM isolates in this study were pulmonary and mainly observed in patients with chronic pulmonary diseases. 4. Several factors were associated with different species, such as bronchiectasis or COPD to MAC and MCA, respectively.

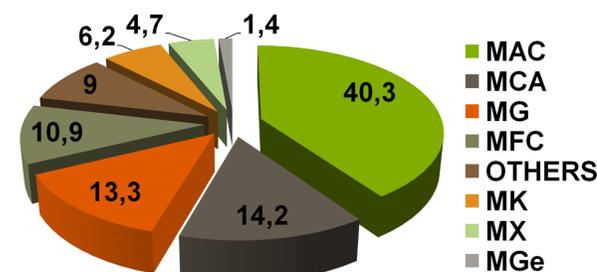


Figure 1. Species distribution (%).

Table 1. Demographic and clinical data from patients (195 cases).

	Frequency (%)		Frequency (%)
• Male	62.1	• Alcohol abuse	10.4
• Spaniards	92.9	• Smoking	47.9
• HIV	14.7	• Other drug use	7.1
• Hematologic neoplasia	8.5	• COPD	23.2
• Solid organ neoplasia	21.3	• Asthma	6.2
• Post-transplantation	4.3	• Bronchiectasis	28.4
• Other no-HIV immunosuppression	2.8	• Fever	25.6
• Previous Mycobacteriosis	18.5	• Respiratory symptoms	51.7
• Diabetes	14.2	• General symptoms	29.4

Table 2. Risk factors associated with different NTM species. Data with statistically significant differences ($p < 0.05$; univariate analysis).

	MAC	No-MAC species
• Diabetes	23.0*	11.4
• COPD	34.2	19.3
	MX	No-MX species
• Alcohol abuse	33.3	10.4
	MK	No-MK species
• General symptoms	85.7	45.2
	MGe	No-MGe species
• HIV	100	13.5
	MCA	No-MCA species
• Bronchiectasis	81	24.9
	MFC	No-MFC species
• Smoking	81	49.1

* Percentage of cases.