Risk Factors, Clinical Characteristic and Treatment Outcomes for Nontuberculous Mycobacterial Disease in Mexico

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Background

There are around 150 species of nontuberculous mycobacteria (NTM) of which approximately 80 are slow-growing mycobacteria (SGM) and 70 are rapid-growing mycobacteria (RGM) [1]. Nontuberculous mycobacteria (NTM) are ubiquitous in environments such as soil, animals, residential tap water and health care facility water systems [2,3,4], and they are transmitted by aerosol, dust, ingestion, skin inoculation, and recently reported human to human transmission in a cystic fibrosis patient. [5]. In spite of this wide distribution, only a third of all species are significant pathogens for humans [1]. Recently, there has been an increased prevalence around the world as well as a geographical and climatic predisposition for species [6-9].

Methods

We conducted a retrospective study at Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran, Mexico, this is a tertiary-care referral medical center with 200 beds for adult medical and surgical patients.

We searched the database of the Clinical Microbiology laboratory to identify patients in whom an NTM was isolated between January 2001 and December 2017; medical records were reviewed to obtain clinical data, radiographic presentation, and treatment outcomes. A description of these parameters for RGM and SGM were classified in clinical syndromes, and a comparison among them was performed.

Results

Figure 1. Annual number of isolations of slowly growing mycobacteria (SGM) from 2001-20017.

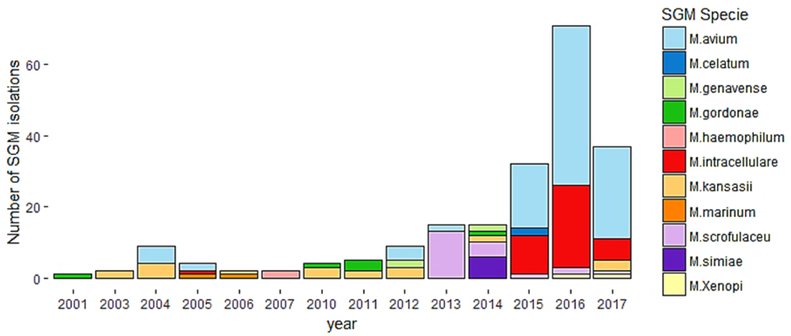

Table 1. Demographic characteristic, site of isolation and risk factors for non-tuberculous mycobacterial disease

	Rapidly growing mycobacterial infections n=90*	Slowly growing mycobacterial infections n=87*	*P*
Sex (%)			
Female	43(62)	26 (38)	0. 01468
Male	47(43)	61(57)	
Median age (range)	51(16-87)	39 (20-92)	
Relevant Medical history (%)			
HIV	4 (4)	43(49)	<0. 001
Cancer	18 (20)	6(7)	0. 02787
Lung disease	9 (10)	3(3)	0. 1344
DM	15 (16)	4(5)	0. 01418
CKD	19 (21)	7(12)	0. 04662
SLE	6 (6)	1(1)	0. 05783
Immunosuppressive medication (%)	24 (26)	4(5)	<0. 001
Invasive dispositive (%)	**20 (22)**	0	<0. 001
Site of isolation†			
Respiratory samples (%) (sputum, BAL, lung biopsy, pleural fluid)	96 (60)	137 (59)	0. 9091
Extra pulmonary (%)			
Blood	39(24)	38(16)	0.1247
Skin and Soft tissue	21(13)	30(13)	
Lymph Node	1(0. 6)	4(2)	
Visceral	1(06)	7(3)	
Stool	1(0. 6)	13(6)	
Urine	2 (1)	3 (1)	

. Number of patients with isolation of nontuberculous mycobacterias

. † there was patients with more of 1 isolation

Table 2. Outcomes of 49 patients with pneumonia for NTM, who met ATS/IDSA criteria. *

	Treatment	No treatment	*P*
All patients(%)	23 (47)	26 (53)	-
Cure (%)	18 (78)	18(69)	-
Persistence (%)	3(13)	3(12)	-
Death(%)	2(9)	5(19)	-
			***P* = 0. 58**

* Median follow-up time was 410 days (range 240 to 5040)

Table 3a

Skin and soft tissue infections			
	Rapidly growing mycobacterial infections n=35	Slowly growing mycobacterial infections n=38	P
Number of antibiotics			
Monotherapy	2	0	0. 7902
Bitherapy	3	2	
Triple therapy or more	4	3	
Median days Hospital stay	14(3-55)	1(1-9)	0. 07192
Median days of treatment	180 (21-1230)	270 (30-360)	0. 9314
Outcomes (%)			
Cure	8(89)	3(60)	0. 5055
Death or persist infection	1(11)	2(40)	

Figure 2. Annual number of isolations of rapidly growing mycobacteria

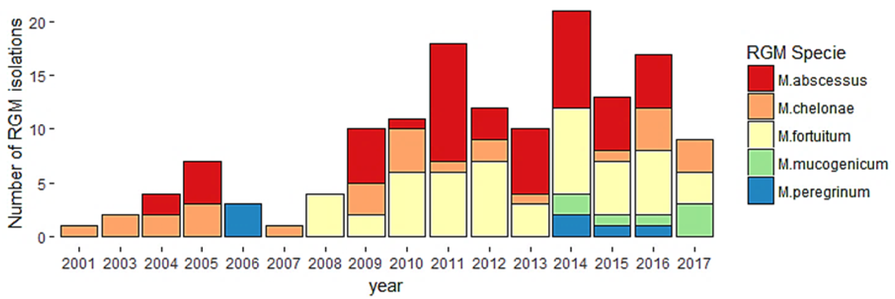

Table 3. Treatment and outcomes of patients who received antibiotic therapy and completed follow-up*

Mycobacterial stream infections and disseminated disease			
	Rapidly growing mycobacterial infections n=35	Slowly growing mycobacterial infections n=38	*P*
Number of antibiotics			
Monotherapy	1	0	1
Bitherapy	8	7	
Triple therapy or more	11	9	
Median days Hospital stay (range)	20. 5(1-75)	30(14-63)	0. 1801
Median days of treatment (range)	42(1-720) *	210(30-365)	**0. 01557**
Outcomes			
Cure (%)	15(75)	5(31)	**0. 02217**
Death or persist infection (%)	5(25)	11(69)	

Table 3b

Lung infections ‡			
	Rapidly growing mycobacterial infections n=35	**Slowly growing mycobacterial infections n=38**	***P***
Number of antibiotics			
Monotherapy	1	0	0. 1929
Bitherapy	3	6	
Triple therapy or more	2	11	
Median days Hospital stay (range)	17 (13-63)	13 (2-15)	0. 04983
Median days of treatment (range)	255(14-540)	360 (15-365)	0. 2993
Outcomes			0. 08859
Cure(%)	3(50)	15(88)	
Death or persist infection(%)	3(50)	2(12)	

* median follow-up time was 410 days (range 240 to 5040)

† One patient died after 1 day of treatment

‡ Meet IDSA/ATS criteria

TMP-SMZ; Trimethoprim-sulfamethozaxol

Conclusions

The evaluation of the epidemiology of NTM infections is mandatory because the incidence is increasing, and outbreaks or higher number of infections in specific populations in risk could be unnoticed.

The decision to treat patients with NTM isolates should be based on careful clinical judgment particularly in lung infections weighing the long time and potentially toxic antibiotic treatment.

Better strategies and simplified drugs regimens from randomized trials are needed.