Prevalence, colonization patterns, antibiotic susceptibility and MALDI-TOF identification of *Burkholderia cepacia* complex isolates from a Spanish cystic fibrosis unit

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BACKGROUND

Burkholderia cepacia* complex** (BCC) species are associated with a rapid decline in lung function and high mortality in cystic fibrosis (CF) patients[1]. Correct identification of BCC species is crucial as some of them, like ***B. cenocepacia, are associated with poorer prognosis[2]. ***B. contaminans*** (Bcont), a novel species with unknown clinical importance, has been reported as the most frequently isolated in Spain[3].

Our objectives were:

- To study the **prevalence**, antibiotic **susceptibility** and **colonization patterns** of the BCC species isolated in our Hospital.
- To compare **MALDI-TOF MS** identification of BCC (used routinely in our laboratory) with the recommended ***recA*** gene sequencing.

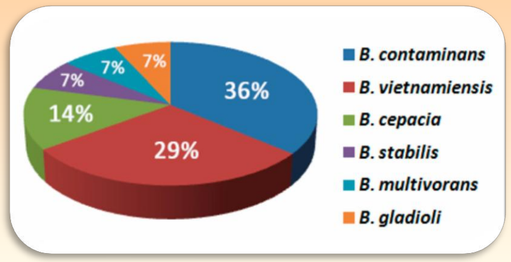
MATHERIAL/METHODS

- ***Burkholderia* spp.** strains isolated from CF-patients between 2010 and 2015 were recovered.
- **Susceptibility testing** was performed by automated microdilution methods (MicroScan).
- **Clonality** of the isolates was assessed by Pulse Field Gel Electrophoresis (PFGE) with ***Spe*I** digestion.
- **Identification** was performed by MALDI-TOF MS (Bruker Daltonics. Germany) and by ***recA*** sequencing.

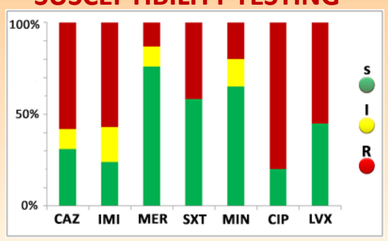
RESULTS

PREVALENCE OF *BURKHOLDERIA* SPP. AND SPECIES DISTRIBUITION

- ***Burkholderia* spp.** strains were isolated in **14 of 313 CF patients.** **4.5% Prevalence**
- ***recA* sequencing identified Bcont** as the most prevalent BCC species (n=5/14 patients)



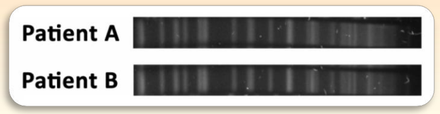
SUSCEPTIBILITY TESTING



S: susceptible; **I:** intermediate; **R:** resistant; **CAZ:** ceftazidime; **IMI:** imipenem; **MER:** meropenem; **SXT:** cotrimoxazole; **MIN:** minocycline; **CIP:** ciprofloxacin; **LVX:** levofloxacin

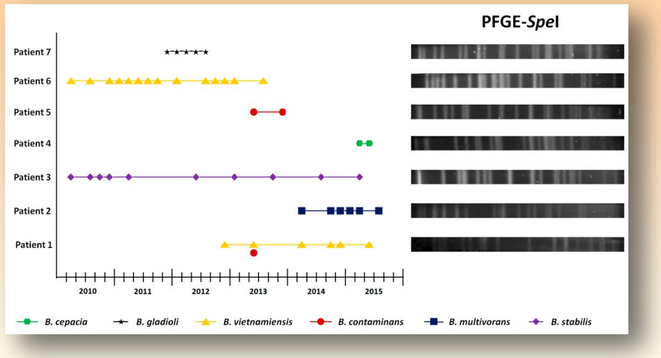
CLONALITY OF THE ISOLATES

- **PFGE showed that each patient harbored his own clone.**
- **Only 2 patients (A and B) shared the same clone of Bcont.**



RESULTS

CHRONIC COLONIZATION



Sequential isolates from patients chronically colonized by *Burkholderia* spp.

- **Chronic colonization was found in 7 patients**
- **Only 1 patient had > 1 isolate of Bcont**

COMPARISON BETWEEN MALDI-TOF AND *recA* IDENTIFICATION

rec A Id.	No. Isolates	MALDI-TOF IDENTIFICATION	
		Correct, n (%)	Incorrect, n(species)
B. multivorans	10	10 (100)	0
B. gladioli	6	6 (100)	0
B. vietnamiensis	23	21 (91)	2 (1 *B. cenocepacia*; 1 *Brevibacillus* spp.)
B. stabilis	6	3 (50)	3 (1 *B. pyrrocinia*; 2 BCC Group)
B. cepacia	3	1 (33)	2 (*B. cenocepacia*)
B. contaminans	7	0 (0)	7 (4 *B. cepacia*; 3 *B. cenocepacia*)

- **MALDI-TOF identified correctly at genus and at species level 98% and 76% of the isolates, respectively.**
- **All *B. multivorans* and *B. gladioli* strains were correctly identifed by MALDI-TOF.**
- **MALDI-TOF always misidentifies Bcont as *B. cepacia* or *B. cenocepacia*.**

CONCLUSIONS

- **Bcont is the most frequent BCC species in our institution but is not frequently associated with chronic infections.**
- **MALDI-TOF misidentification could have a negative clinical and psychosocial impact as the most prevalent BCC species in Spain are frequently misidentified as *B. cenocepacia*.**
- **MALDI-TOF could be a rapid a promising tool for the identification of BCC species, but an increased number of BCC spectra in its database is needed.**

1. Mahenthiralingam E, *et al*. Nat Microbiol Rev. 2005; 2. Saiman L, *et al*. Infect Control Hosp Epidemiol. 2014; 3. Medina-Pascual MJ, *et al*. Eur J Clin Infect Dis 2012.