

Characteristics and Consequences of Fungal Respiratory Colonization of 201 Adult Patients with Cystic Fibrosis

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Objectives

- **Nature of the fungal respiratory colonization**
 - ✓ Yeasts
 - ✓ Filamentous fungi (molds)
- **Factors in relation with fungal colonization ?**
 - ✓ Age, Sex, Genotype
 - ✓ Cirrhosis, Pancreas insufficiency, Diabetes
 - ✓ Bacteria
 - ✓ ABPA

Methods

- **Retrospective study (2005-2006)**

- ✓ 657 sputa
 - 201 patients (53% males)
 - Age 17- 65 years (median 26)
- ✓ We excluded
 - Transplantation

- **Conventional Methods**

Yeasts

- **72 % (152/201) of the patients**

	<hr/> Patients <hr/>
<i>C. albicans</i>	72%
Others <i>Candida</i>	8%
<i>C. glabrata</i>	5%
<i>C. parapsilosis</i>	1.4%
<i>C. tropicalis</i>	0.5%
<i>C. kefyr</i>	0.5%
<i>C. lusitaniae</i>	0.5%

Yeasts

- 72 % (152/201) of the patients

	Patients	Samples
<i>C. albicans</i>	72%	67% (358/535)
Others <i>Candida</i>	8%	27% (26/96)
<i>C. glabrata</i>	5%	
<i>C. parapsilosis</i>	1.4%	
<i>C. tropicalis</i>	0.5%	
<i>C. kefyr</i>	0.5%	
<i>C. lusitaniae</i>	0.5%	

Filamentous fungi

- **66 % of the patients**

- ✓ One species in 48% of the patients
- ✓ Different species in 17% of the patients

	Patients
<i>A. fumigatus</i>	57%
Other <i>Aspergillus</i>	10%
<i>A. flavus</i>	3%
<i>A. niger</i>	3%
<i>A. nidulans</i>	2%
<i>A. terreus</i>	1%
<i>A. versicolor</i>	1%
<i>S. apiospermum</i>	3%

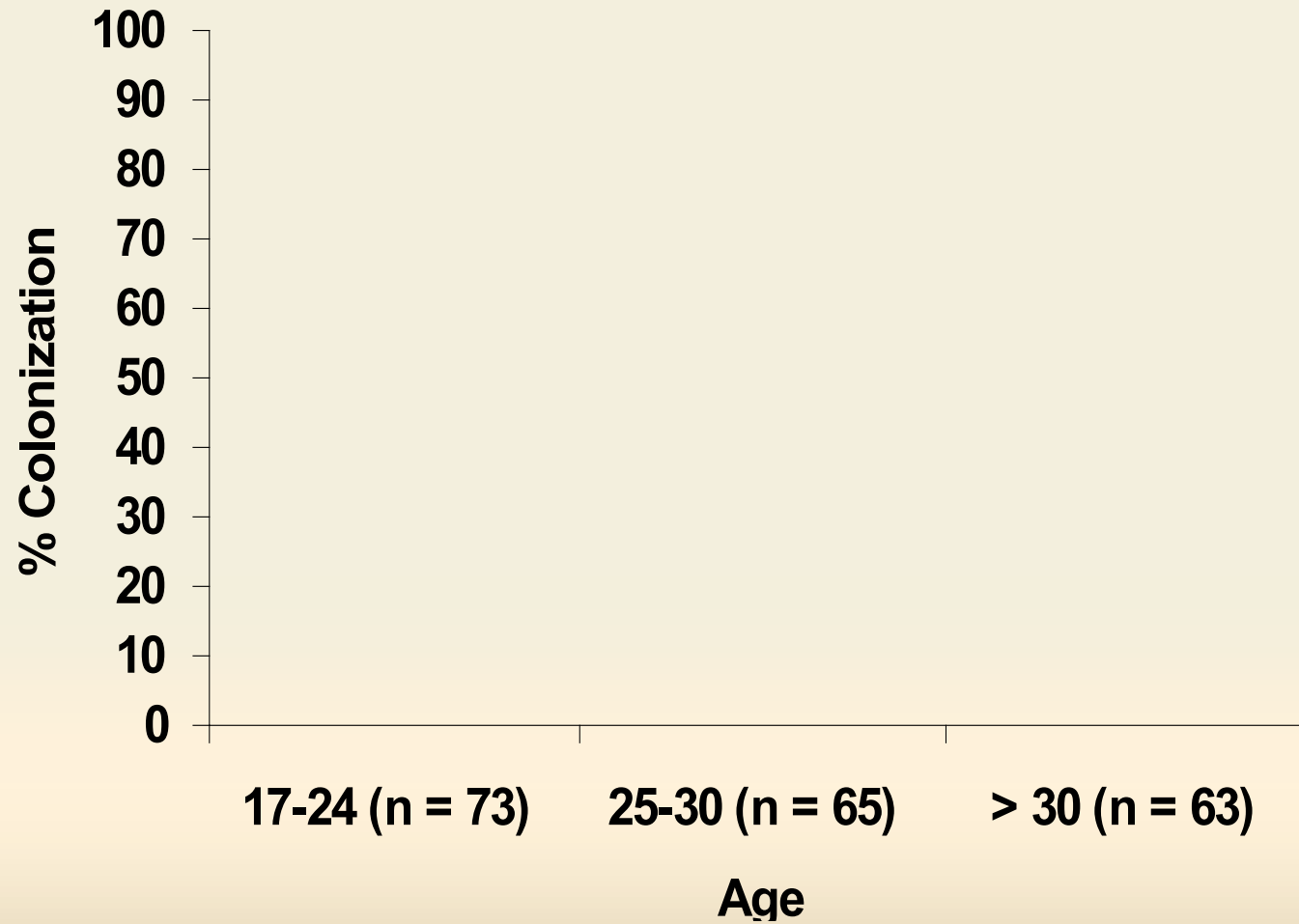
Filamentous fungi

- **66 % of the patients**

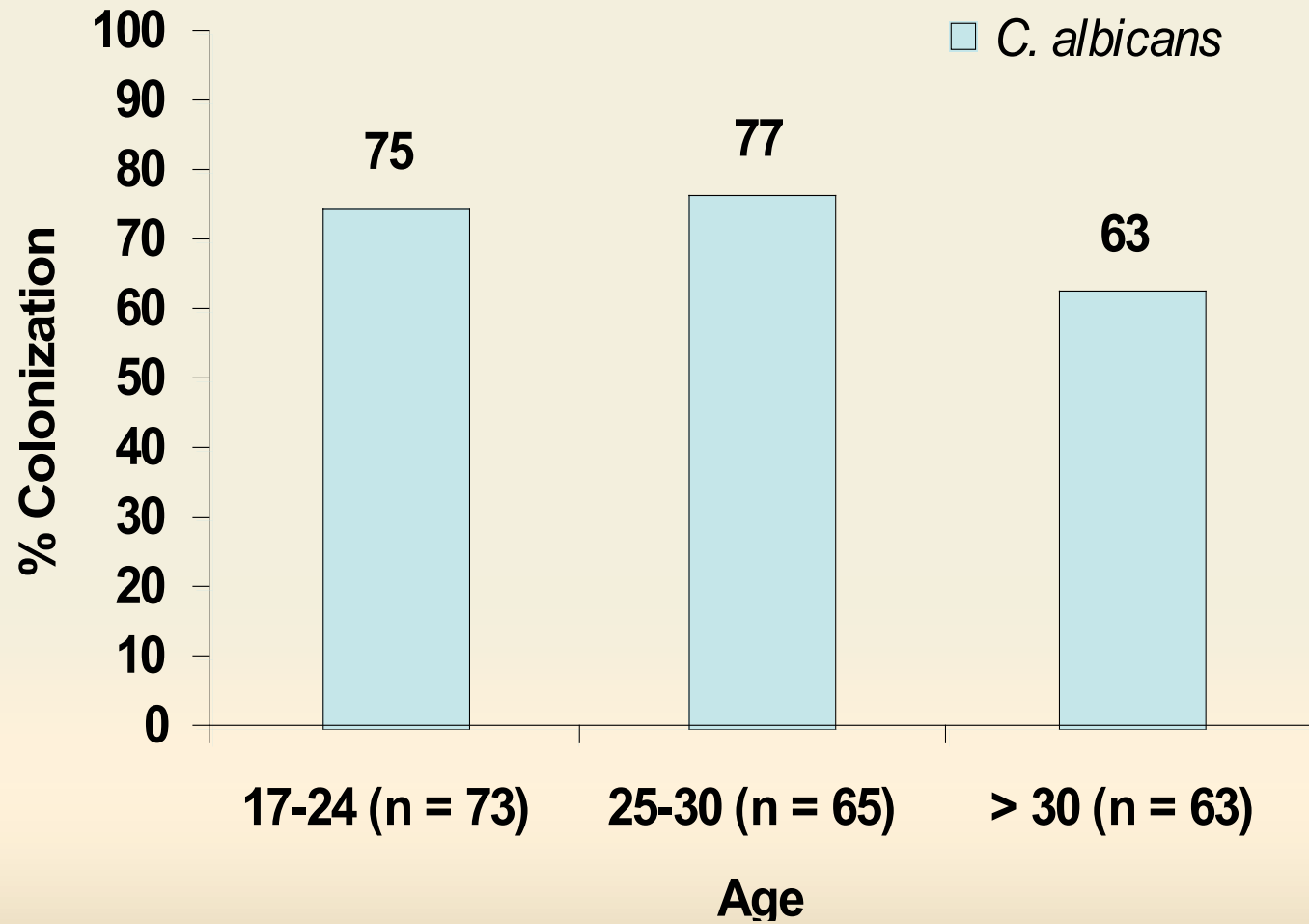
- ✓ One species in 48% of the patients
- ✓ Different species in 17% of the patients

	Patients	Samples
<i>A. fumigatus</i>	57%	71% (322/453)
Other <i>Aspergillus</i>	10%	21% (27/125)
<i>A. flavus</i>	3%	
<i>A. niger</i>	3%	
<i>A. nidulans</i>	2%	
<i>A. terreus</i>	1%	
<i>A. versicolor</i>	1%	
<i>S. apiospermum</i>	3%	58% (31/53)

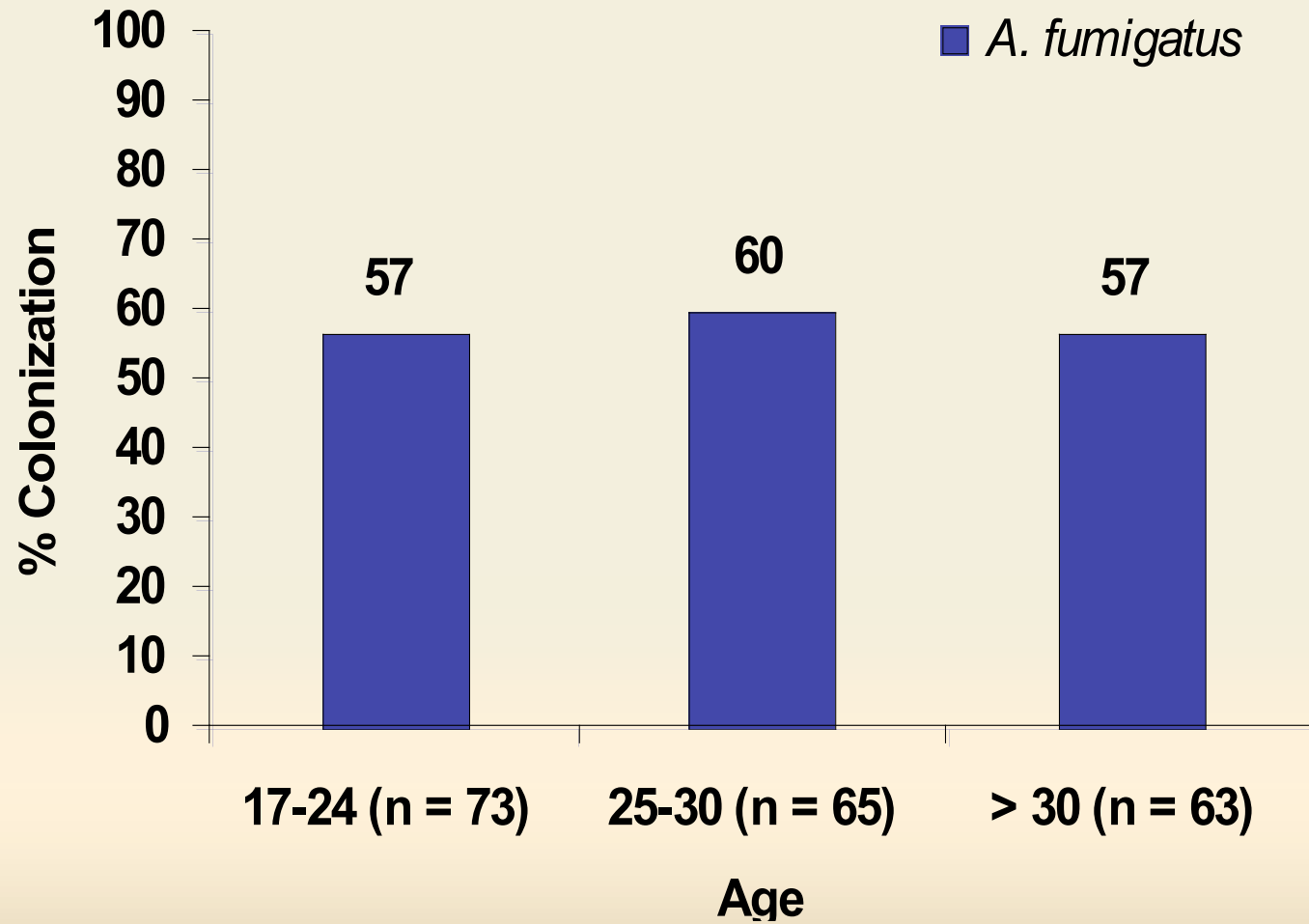
Fungal colonization and age



Fungal colonization and age



Fungal colonization and age



Impact of sex, genotype

Sex	Males	Females	p
<i>C. albicans</i>	80% (84/105)	63% (61/96)	0.009

Impact of sex, genotype

Sex		Males	Females	p
	<i>C. albicans</i>	80% (84/105)	63% (61/96)	0.009
Genotype		Severe	Moderate	
	<i>C. albicans</i>	75% (109/145)	67% (33/49)	0.28

Impact of sex, genotype

Sex	Males	Females	p
<i>C. albicans</i>	80% (84/105)	63% (61/96)	0.009
<i>A. fumigatus</i>	54% (57/105)	59% (61/96)	0.46

Genotype	Severe	Moderate	
<i>C. albicans</i>	75% (109/145)	67% (33/49)	0.28
<i>A. fumigatus</i>	56% (82/145)	55% (27/49)	0.85

Impact of CF complications

	Presence	Absence	p
Diabetes			
<i>C. albicans</i>	75% (40/53)	71% (105/148)	0.05

Impact of CF complications

	Presence	Absence	p
Diabetes			
<i>C. albicans</i>	75% (40/53)	71% (105/148)	0.05
Cirrhosis			
<i>C. albicans</i>	80% (8/10)	72% (137/191)	0.43
Pancreas Insufficiency			
<i>C. albicans</i>	72% (119/164)	70% (26/37)	0.77

Impact of CF complications

	Presence	Absence	p
Diabetes			
<i>C. albicans</i>	75% (40/53)	71% (105/148)	0.05
<i>A. fumigatus</i>	41% (22/53)	62% (92/148)	0.007
Cirrhosis			
<i>C. albicans</i>	80% (8/10)	72% (137/191)	0.43
Pancreas Insufficiency			
<i>C. albicans</i>	72% (119/164)	70% (26/37)	0.77

Impact of CF complications

	Presence	Absence	p
Diabetes			
<i>C. albicans</i>	75% (40/53)	71% (105/148)	0.05
<i>A. fumigatus</i>	41% (22/53)	62% (92/148)	0.007
Cirrhosis			
<i>C. albicans</i>	80% (8/10)	72% (137/191)	0.43
<i>A. fumigatus</i>	40% (4/10)	57% (110/191)	0.44
Pancreas Insufficiency			
<i>C. albicans</i>	72% (119/164)	70% (26/37)	0.77
<i>A. fumigatus</i>	56% (92/164)	54% (22/37)	0.70

Bacteria-fungi interactions

	Presence	Absence	p
<i>P. aeruginosa</i>			
<i>C. albicans</i>	73% (110/150)	69% (35/51)	0.33
<i>S. aureus</i>			
<i>C. albicans</i>	76% (98/129)	65% (47/72)	0.05

P. aeruginosa in 74% of patients

S. aureus in 83% of patients

Bacteria-fungi interactions

	Presence	Absence	p
<i>P. aeruginosa</i>			
<i>C. albicans</i>	73.3% (110/150)	68.6% (35/51)	0.33
<i>A. fumigatus</i>	60% (90/150)	47% (24/51)	0.07
<i>S. aureus</i>			
<i>C. albicans</i>	75.9% (98/129)	65.2% (47/72)	0.05
<i>A. fumigatus</i>	59.6% (77/129)	51.3% (37/72)	0.15

P. aeruginosa in 74% of patients

S. aureus in 83% of patients

Multivariate analysis: risk factors for ABPA

	OR	p	Range
<i>A. fumigatus</i>	1.58	0.43	[0.49, 5.05]
<i>S. apiospermum</i>	13.04	0.006	[2.11, 80.42]

ABPA in 9% (18/201) of our patients

Conclusion

- **Fungal colonization and age**
 - ✓ Stable
- **Bacteria-fungi interactions**
 - ✓ *C. albicans* - *S. aureus*
 - ✓ *A. fumigatus* - *P. aeruginosa*
- **ABPA**
 - ✓ *S. apiospermum*