

Prevalence and risk factors for recovery of filamentous fungi in individuals with cystic fibrosis

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- **Background:** Filamentous fungi are frequently recovered from respiratory cultures of individuals with CF
- **Material:** A CF cohort database (614 patients)
- **Aim:** To determine filamentous fungal prevalence and risk factors

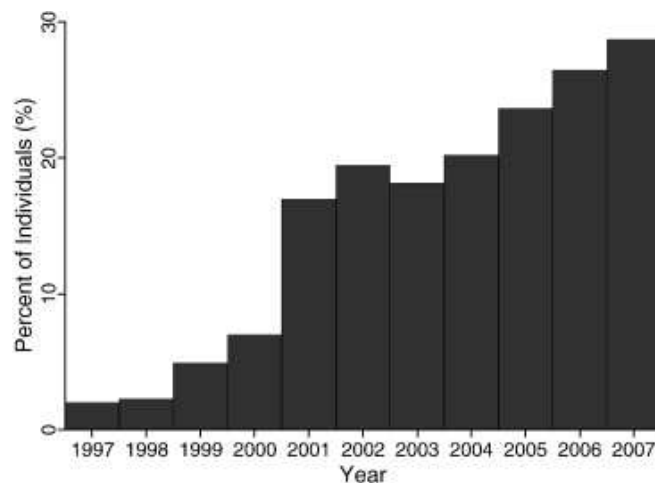
Prevalence of bacterial, filamentous fungal and yeast species recovered 1997–2007.

| | # of individuals (%) <i>n</i> =614 | # of isolates (%) <i>n</i> =14,288 |
|---|---------------------------------------|---------------------------------------|
| <i>Filamentous fungi and yeast</i> | | |
| <i>Aspergillus fumigatus</i> | 223 (36.3) | 885 (6.0) |
| <i>Aspergillus</i> (non- <i>fumigatus</i>) | 160 (26.1) | 107 (0.7) |
| <i>Trichosporon</i> spp. | 13 (2.1) | 44 (0.3) |
| <i>Scedosporium</i> spp. | 14 (2.3) | 21 (0.1) |
| Other filamentous fungi ^a | 31 (5.0) | 41 (0.5) |
| Yeast ^b | 175 (28.5) | 324 (2.2) |
| <i>Bacteria</i> | | |
| <i>Pseudomonas</i> spp. | 513 (83.6) | 5209 (35.7) |
| <i>Staphylococcus aureus</i> | 493 (80.3) | 4640 (31.8) |
| <i>Haemophilus influenzae</i> | 217 (35.3) | 382 (2.6) |
| <i>Burkholderia cepacia</i> complex | 32 (5.2) | 98 (0.7) |
| Other bacteria | 486 (79.1) | 2537 (17.4) |

^a *Alternaria*, *Curvularia*, *Fusarium*, *Paecilomyces*, *Penicillium*, and *Exophiala* species.

^b *Candida albicans*, *Candida glabrata*, and undifferentiated yeast species.

Recovery of at least one filamentous fungal species from lung culture during 1997–2007



Characteristics of quarters with isolation of filamentous fungi compared to quarters recovering only bacteria or yeast species.

| | Filamentous fungi recovered (n=1012) | No filamentous fungi recovered (n=7575) | p-value |
|---------------------------------------|--------------------------------------|---|---------|
| Age | 23.8 | 17.8 | <0.001 |
| FEV ₁ percent predicted | 63.3 | 72.2 | <0.001 |
| BMI (kg/m ²) | 20.3 | 19.6 | <0.001 |
| # Cultures during quarter | 2.7 | 1.6 | <0.001 |
| % During quarter 3 and 4 ^a | 51.0 | 51.7 | 0.660 |
| Pulmonary therapies (%) | | | |
| Antifungals | 2.6 | 1.4 | 0.005 |
| Inhaled corticosteroid | 3.7 | 2.7 | 0.077 |
| Oral corticosteroid | 2.5 | 1.0 | <0.001 |
| Inhaled antibiotics | 25.9 | 10.6 | <0.001 |
| Chronic oral antibiotics | 10.8 | 3.7 | <0.001 |

^a Assessment of seasonality.

Results I

- The prevalence of filamentous fungal isolation increased from 2.0% in 1997 to 28.7% in 2007
- The odds of isolating filamentous fungi during a quarter was
 - greater in CF adults [p<0.001]
 - during chronic oral antibiotic use [p=0.002]
 - increased with each 10% drop in FEV1 percent predicted [p=0.005]
 - inhaled corticosteroids surprisingly decreased the likelihood [p=0.012]

Results II

- The direction of these effects persisted after excluding individuals with ABPA
- Independent risk factors for onset of fungal colonization
 - Older age [p=0.019]
 - Use of inhaled antibiotics [p=0.011]

Conclusion

- Isolation of filamentous fungi in CF at JHH has increased and risk factors include older age, decreased lung function, and chronic oral antibiotics