CHANGING EPIDEMIOLOGY OF BLASTOMYCYES DERMATITIDIS INFECTION IN QUEBEC, CANADA: A RETROSPECTIVE MULTICENTER STUDY

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BACKGROUND
With the increasing incidence of blastomycosis in Quebec, Canada, clinicians have also observed its possible increase in severity, with occasional deaths.

OBJECTIVES
• To assess temporal changes in blastomycosis severity and mortality in Quebec
• To identify risk factors for blastomycosis mortality

METHOD
• Retrospective multicenter cohort study of patients with confirmed blastomycosis identified in a database at the provincial laboratory (Laboratoire de Santé Public du Québec) between 1988 and 2016
• Data collected from 39 different institutions
• The primary outcome was 90-day all-cause mortality.
• Risk factors for mortality were identified using multivariate logistic regression.

RESULTS

Table 1: Characteristics of patients with Blastomyces dermatitidis infection in Quebec, 1988-2017

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (%), n=176</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Female: 42 (23.9%), Male: 134 (76.2)</td>
</tr>
<tr>
<td>Duration of symptoms before diagnosis (days), median (IQR)</td>
<td>57 (25, 120.5)</td>
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<tr>
<td>Number of affected organs</td>
<td>One: 115 (65.3%), Two or more: 61 (34.7%)</td>
</tr>
<tr>
<td>Localization of infection</td>
<td>Lungs: 142 (80.7%), Skin: 71 (40.3%), Musculoskeletal: 25 (14.2%), Central nervous system: 8 (4.5%), Urinary tract: 10 (5.5%), Others: 4 (2.3%)</td>
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<tr>
<td>Hospitalization</td>
<td>Length of stay (days), median (IQR): 119 (67.6%), Intensive care unit admission: 37 (21.0%), Length of stay (days), median (IQR): 4 (2.9)</td>
</tr>
</tbody>
</table>

Table 2: Evolution of characteristics of blastomycosis cases over years

<table>
<thead>
<tr>
<th>Year</th>
<th>Age (years), median (IQR)</th>
<th>Sex</th>
<th>Number of affected organs</th>
<th>Chronic obstructive pulmonary disease</th>
<th>Diabetes</th>
<th>Immunosuppression</th>
<th>Charlson score</th>
<th>First antifungal received</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988-1997</td>
<td>47.4 (42.9, 61.2)</td>
<td>Female: 11 (33%), Male: 22 (67%)</td>
<td>One: 17 (52%), Two: 16 (48%)</td>
<td>6 (18%)</td>
<td>1 (3%)</td>
<td>2 (6%)</td>
<td>0</td>
<td>Amphotericin B, lipid formulations</td>
</tr>
<tr>
<td>1998-2008</td>
<td>53.6 (41.5, 66.2)</td>
<td>Female: 12 (22%), Male: 42 (78%)</td>
<td>One: 32 (59%), Two: 22 (41%)</td>
<td>8 (15%)</td>
<td>9 (17%)</td>
<td>12 (22%)</td>
<td>0</td>
<td>Deoxycholate amphotericin b, Azole</td>
</tr>
<tr>
<td>2008-2017</td>
<td>59.0 (50.5, 70)</td>
<td>Female: 19 (21%), Male: 70 (79%)</td>
<td>One: 66 (74%), Two: 23 (26%)</td>
<td>23 (26%)</td>
<td>21 (24%)</td>
<td>29 (33%)</td>
<td>0</td>
<td>Azole, No treatment</td>
</tr>
</tbody>
</table>

P-value
1988-1997 vs 1998-2008: 0.004
1988-1997 vs 2008-2017: 0.004
1998-2008 vs 2008-2017: 0.006

CONCLUSION
• The severity of blastomycosis observed in Quebec over the past 30 years has increased.
  • Circulation of strains with increased virulence?
  • Impact of climatic changes? (inhalation of increasing spore load ?)
• These changes could be explained in part by an increase in the number of immunosuppressed patients.
• Despite increasing severity, mortality has remained stable in the recent years.

REFERENCES

HIGHLIGHTS OF RESULTS
• Overall mortality of 17.6% (31/176).
• Progressive replacement of deoxycholate amphotericin use with lipid formulations over the years.
• Increasing proportion of diabetic and immunocompromised patients over the years.
• Independent risk factors for mortality were age (adjusted odds ratio [aOR] 1.03; 95% confidence interval [95% CI] 1.00–1.07; p=0.05) and immunosuppression (aOR 3.63; 95% CI 1.54–8.49; p=0.003).