3rd Methods in International NeuroAIDS Research

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Grand Hotel Villa Tuscolana

HIV Neurobehavioral Research Program • University of California, San Diego
Screening For Cryptococcal Infection In HIV-infected Patients Visiting HIV clinics at two Hospitals In Addis Ababa, Ethiopia

“3rd Methods in International NeuroAIDS Research”

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Sponsor: EMORY Global Health Institute
BACKGROUND

- Cryptococciosis is caused by an encapsulated yeast *C. neoformans* and the portal of entry in humans is the lung. Lung infection can be with or without pneumonia.

- HIV infection and other conditions which suppress cell mediated immunity favor dissemination from the lung foci to CNS
In 2008, an estimated over 750,000 cases of cryptococcal meningitis (CM) among HIV-infected patients were diagnosed with 530,000 deaths in Sub-Saharan Africa only.

A strategy of screening for Cryptococcus in the blood in asymptomatic patients with CD4 < 200/mm³ may reduce morbidity and mortality from CM.
Cambodia -17.7%) (Micol R, et al. JAIDS 2007).
  1/2 of the study participants were severely immunosuppressed inpatients


Sub-Saharan Africa
  Uganda- 5.8% (Liechty et al. TMIH 2007).
    Asymptomatic, CD4 count of < 100 mm$^3$
  South Africa -7% (Jarvis et al., J Infect 2009).
    Asymptomatic, CD4 count of < 200 mm$^3$
OBJECTIVES

- To determine prevalence of asymptomatic Cryptococcal infection and its predictive factors in HIV-Infected patients visiting HIV clinics at two academic hospitals in Addis Ababa, Ethiopia
METHODS

- **Study Subjects**
  - HIV-infected patients with CD4 < 200 visiting Black Lion and ALERT HIV clinics

- **Study design**
  - A cross-sectional screening study was conducted from May 9- June 25, 2011
Study Variables

- **Dependent variables**
  - Cryptococcal antigenemia with antigen titer of positives

- **Independent Variables**
  - CD4 count
  - Socio-demographic variable
  - Other opportunistic infections
  - Patients anti-retroviral treatment status
Data Collection

- Structured questionnaire on
  - Demographics
  - Height, Weight
  - HIV history (Date of diagnosis, most recent CD4)
  - Cryptococcal disease history
  - Patient co-morbidities, current symptoms
Laboratory Testing

- A Cryptococcal Antigen Latex Agglutination Test (CALAS Meridian) was performed (according to the Insert)

- Equal volume of serum and pronase solution were mixed to minimize false positivity (avoids Rheumatoid Factor and other interferences)
Inclusion Criteria

- Age ≥ 18 years old
- Confirmed HIV infection
- CD4 cells < 200/mm³

Exclusion Criteria

- Treated for Cryptococcal infection in last 3 months
- Taking systemic antifungal agent at time of visit
Data Analysis

- Raw data entered in to EpiData 3.1
- Statistical analysis was performed using STATA Ver. 8.2
- Descriptive data analysis was utilized to determine prevalence of cryptococcal antigenemia and distribution of study covariates
- Multivariate logistic regression was done to assess relationship between risk factors and a positive cryptococcal antigen test
RESULTS

- Total of 256, 141 (55%) females and 115 (45%) males, HIV- patients with a median age of 35 years were included in this study.

- Of the 256 patients, 26 (10.2%) were positive.

- The range of titer for serum cryptococcal antigen was 1:8 to 1:128
<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>CRAG Test result</th>
<th>Total N= 256 (%)</th>
<th>X²-Value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative, n (%)</td>
<td>Positive, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CD4 count</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100</td>
<td>67 (29.13)</td>
<td>14 (53.85)</td>
<td>83 (32.42)</td>
<td>11.1975</td>
</tr>
<tr>
<td>&gt;=100</td>
<td>163 (70.87)</td>
<td>12 (46.15)</td>
<td>173 (67.58)</td>
<td></td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>131 (56.96)</td>
<td>10 (7.09)</td>
<td>141 (55.08)</td>
<td>3.2295</td>
</tr>
<tr>
<td>Male</td>
<td>99 (43.04)</td>
<td>16 (13.91)</td>
<td>115 (44.92)</td>
<td></td>
</tr>
<tr>
<td><strong>Warehouse</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>No</td>
<td>219 (95.22)</td>
<td>24 (92.31)</td>
<td>243 (94.92)</td>
<td>0.4103</td>
</tr>
<tr>
<td>Yes</td>
<td>11 (4.78)</td>
<td>2 (7.69)</td>
<td>13 (5.08)</td>
<td></td>
</tr>
<tr>
<td><strong>Age (Years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 35</td>
<td>105 (45.65)</td>
<td>6 (23.08)</td>
<td>111 (43.36)</td>
<td>4.8475</td>
</tr>
<tr>
<td>&gt;= 35</td>
<td>125 (54.35)</td>
<td>20 (76.92)</td>
<td>145 (56.64)</td>
<td></td>
</tr>
<tr>
<td><strong>Pts with other OI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>179 (77.83)</td>
<td>22 (84.62)</td>
<td>201 (78.52)</td>
<td>0.6383</td>
</tr>
<tr>
<td>Yes</td>
<td>51 (22.17)</td>
<td>4 (15.38)</td>
<td>55 (21.48)</td>
<td></td>
</tr>
<tr>
<td><strong>ART Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naïve</td>
<td>69 (30.00)</td>
<td>3 (11.54)</td>
<td>72 (28.12)</td>
<td>3.9385</td>
</tr>
<tr>
<td>On ART</td>
<td>161 (70.00)</td>
<td>23 (88.46)</td>
<td>184 (71.88)</td>
<td></td>
</tr>
<tr>
<td><strong>BMI (Kg/m²)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 20</td>
<td>118 (51.30)</td>
<td>19 (73.08)</td>
<td>137 (53.52)</td>
<td>4.4514</td>
</tr>
<tr>
<td>&gt;= 20</td>
<td>112 (48.70)</td>
<td>7 (26.92)</td>
<td>119 (46.48)</td>
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</table>
In multivariate analysis, CD4 count < 100 Cells/mm$^3$ and age greater than 35 years (Median age) were independently associated with positive Cryptococcal antigenemia.

CD4 count < 100 Cells/mm$^3$ was a strong predictor of positive cryptococcal antigenemia (AOR = 3.7, P< 0.001).
CONCLUSION

- Serum cryptococcal antigen was common in asymptomatic patients irrespective of ART status

- “All” HIV patients with CD4 count of < 200 cells/mm$^3$ should be routinely screened for asymptomatic cryptococcal infection
Thank you!