Disclosures

- Gilead Sciences: Advisory Board
- Bristol Meyers Squibb: Travel Grant
- Gilead Sciences: Travel Grant
The impact of the number of co-morbidities and aging on Health Related Quality of Life in HIV-infected and uninfected individuals

Results of the AGEhIV Cohort Study

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HIV-infected persons: premature onset of age-associated non-communicable co-morbidities (AANCCs) compared to the general population$^{1,2}$. Such co-morbidities may have a negative impact on patients’ Health-related quality of life (HRQL) and depression.

Previous research$^3$: HIV infection itself and aging may also have a negative impact on HRQL and depression.

Objectives

➢ To investigate the impact of the number of co-morbidities, ageing and HIV infection on HRQL and depression.

➢ To investigate if age and the number of comorbidities have a different impact on HRQL and depression in HIV positive versus HIV negative persons.
AGE$_h$IV Cohort

- Comparative observational cohort study
- HIV-1-infected $\geq 45$ years Academic Medical Center, Amsterdam
- HIV-uninfected $\geq 45$ years STD clinic of Municipal Health Service, Amsterdam
- Participants were screened at enrollment for the presence of co-morbidities:
  - DM2, hypertension, COPD, renal disease, chronic liver disease, myocardial infarction, angina pectoris, peripheral arterial disease, ischemic cerebrovascular disease and non-AIDS/AIDS associated cancer
Medical Outcomes Study Short Form 36-item health survey (SF36).
Methods and analysis (2)

- Depression: Patient Health Questionnaires (PHQ-9) and Centers for Epidemiologic Studies Depression scale (CES-D)
- General linear models HRQL: HIV-infection (y/n), number of co-morbidities (0, 1, 2, >2), and age (<50, 50-55, 55-60, 60-65, >65)
- Effect sizes for differences in HRQL between HIV+ en HIV-:
  mean differences/pooled standard deviations.
- All models adjusted for background characteristics: gender, MSM (y/n), Dutch origin, living together (y/n), educational level, and life style factors, i.e., current smoker (y/n), heavy daily drinking (y/n), and ever IVD (y/n).
## Characteristics at enrollment

<table>
<thead>
<tr>
<th></th>
<th>HIV-uninfected participants (n=524)</th>
<th>HIV-infected participants (n=540)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age, y</strong></td>
<td>52.1 (47.9-58.3)</td>
<td>52.9 (48.3-59.6)</td>
<td>.200</td>
</tr>
<tr>
<td><strong>Male sex</strong></td>
<td>85.1%</td>
<td>88.1%</td>
<td>.146</td>
</tr>
<tr>
<td><strong>Dutch origin</strong></td>
<td>81.3%</td>
<td>72.2%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>MSM</strong></td>
<td>69.7%</td>
<td>73.9%</td>
<td>.125</td>
</tr>
<tr>
<td><strong>Number of AANCCs, median (IQR)</strong></td>
<td>1 (0-1)</td>
<td>1 (0-2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Number of AANCCs, mean (SD)</strong></td>
<td>0.95 (0.96)</td>
<td>1.27 (1.15)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>On cART</strong></td>
<td></td>
<td>95.7%</td>
<td></td>
</tr>
<tr>
<td><strong>Plasma viral load &gt;200 c/ml, among participants on cART</strong></td>
<td></td>
<td>1.5%</td>
<td></td>
</tr>
<tr>
<td><strong>CD4 count, median (IQR)</strong></td>
<td></td>
<td>565 (435-745)</td>
<td></td>
</tr>
</tbody>
</table>
Quality of Life study population versus general population

<table>
<thead>
<tr>
<th></th>
<th>HIV -</th>
<th>HIV +</th>
</tr>
</thead>
<tbody>
<tr>
<td>physical functioning</td>
<td>0.321</td>
<td>0.0736</td>
</tr>
<tr>
<td>role-physical</td>
<td>0.229</td>
<td>-0.0241</td>
</tr>
<tr>
<td>bodily pain</td>
<td>0.379</td>
<td>0.2525</td>
</tr>
<tr>
<td>general health</td>
<td>0.219</td>
<td>-0.2786</td>
</tr>
<tr>
<td>vitality</td>
<td>0.0015</td>
<td>-0.3393</td>
</tr>
<tr>
<td>social functioning</td>
<td>-0.0028</td>
<td>-0.2297</td>
</tr>
<tr>
<td>role-emotional</td>
<td>-0.0116</td>
<td>-0.1545</td>
</tr>
<tr>
<td>mental health</td>
<td>-0.0516</td>
<td>-0.1868</td>
</tr>
</tbody>
</table>
Quality of Life HIV-positive and HIV-negative individuals

HIV –infected individuals:
- Physical functioning
- Role functioning (physical)
- Social functioning
- Vitality
- Health perspectives
• Physical health decrease with the increase of the number of co-morbidities
• HIV positive scores worse on physical health

HIV-status : p=<0.001
Nr. of co-morbidities: p=<0.001
Interactie: NS
Mental Health and co-morbidities

- HIV positive have worse mental health
- Number of co-morbidities not associated with mental quality of life

HIV status: p=0.015
Nr. of co-morbidities: p=0.50
Interaction: NS
Physical Health by age

- Physical health not significantly associated with age
- HIV infected individuals significantly lower physical health than HIV-uninfected individuals
- Tendency that difference become smaller with increasing age
Mental Health by age

- HIV positive associated with worse mental health than HIV negatives
- Younger age and HIV positive were significantly associated with a worse mental health.
- Female gender, living alone, heavy daily drinking and current smoker significantly associated with lower levels of mental health

HIV status: p=0.015
Age: p=<0.001
Interaction: NS
Differences between HIV-infected and HIV-uninfected participants in HRQL and depression
<table>
<thead>
<tr>
<th></th>
<th>HIV-infected participants (n=541)</th>
<th>HIV-uninfected participants (n=524)</th>
<th>Effect size, Model 1</th>
<th>Effect size, Model 2</th>
<th>Effect size, Model 3</th>
<th>Effect size, Model 4</th>
<th>Effect size, Model 5</th>
<th>Effect size, Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRQL (SF-36), mean (SD)(^1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical functioning</td>
<td>85 (20)</td>
<td>90 (16)</td>
<td>0.27(^{**})</td>
<td>0.20(^{**})</td>
<td>0.20(^{*})</td>
<td>0.20(^{**})</td>
<td>0.10</td>
<td>0.08</td>
</tr>
<tr>
<td>Role functional-physical</td>
<td>75 (38)</td>
<td>84 (32)</td>
<td>0.25(^{**})</td>
<td>0.20(^{**})</td>
<td>0.20(^{**})</td>
<td>0.24(^{**})</td>
<td>0.19(^{*})</td>
<td>0.17(^{*})</td>
</tr>
<tr>
<td>Bodily pain</td>
<td>80 (22)</td>
<td>82 (21)</td>
<td>0.12(^{*})</td>
<td>0.10</td>
<td>0.10</td>
<td>0.06</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Social functioning</td>
<td>81 (22)</td>
<td>86 (19)</td>
<td>0.21(^{**})</td>
<td>0.19(^{**})</td>
<td>0.19(^{**})</td>
<td>0.23(^{**})</td>
<td>0.22(^{**})</td>
<td>0.20(^{**})</td>
</tr>
<tr>
<td>Mental health</td>
<td>75 (18)</td>
<td>77 (17)</td>
<td>0.11</td>
<td>0.10</td>
<td>0.09</td>
<td>0.11</td>
<td>0.16(^{*})</td>
<td>0.12</td>
</tr>
<tr>
<td>Role functioning-emotional</td>
<td>79 (35)</td>
<td>83 (32)</td>
<td>0.11</td>
<td>0.09</td>
<td>0.09</td>
<td>0.12</td>
<td>0.10</td>
<td>0.07</td>
</tr>
<tr>
<td>Vitality</td>
<td>65 (20)</td>
<td>72 (18)</td>
<td>0.31(^{**})</td>
<td>0.30(^{**})</td>
<td>0.30(^{**})</td>
<td>0.33(^{**})</td>
<td>0.36(^{**})</td>
<td>0.32(^{**})</td>
</tr>
<tr>
<td>Health perceptions</td>
<td>63 (21)</td>
<td>73 (18)</td>
<td>0.51(^{**})</td>
<td>0.45(^{**})</td>
<td>0.45(^{**})</td>
<td>0.47(^{**})</td>
<td>0.42(^{**})</td>
<td>0.40(^{**})</td>
</tr>
<tr>
<td>Physical health summary score</td>
<td>49 (9)</td>
<td>52 (8)</td>
<td>0.35(^{**})</td>
<td>0.29(^{**})</td>
<td>0.29(^{**})</td>
<td>0.29(^{**})</td>
<td>0.20(^{**})</td>
<td>0.18(^{*})</td>
</tr>
<tr>
<td>Mental health summary score</td>
<td>50 (10)</td>
<td>51 (10)</td>
<td>0.12(^{*})</td>
<td>0.12(^{*})</td>
<td>0.12</td>
<td>0.16(^{*})</td>
<td>0.21(^{**})</td>
<td>0.17(^{*})</td>
</tr>
<tr>
<td>Depression (PHQ-9 score ≥10), No (%)(^2)</td>
<td>78 (14.5%)</td>
<td>42 (8.0%)</td>
<td>1.94(^{**})</td>
<td>1.85(^{**})</td>
<td>1.85(^{**})</td>
<td>2.08(^{**})</td>
<td>3.23(^{**})</td>
<td>2.90(^{**})</td>
</tr>
</tbody>
</table>

* \( p \leq 0.05 \), ** \( p \leq 0.01 \)
HIV+ have worse physical and mental HRQL, and more depression than HIV-

Difference in HRQL between HIV+ versus HIV- does not become greater with increasing age or increasing number of co-morbidities

Even HIV+ without co-morbidities have significantly worse physical HRQoL than HIV-
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Specific co-morbidities and physical health

- co-morbidity
+ co-morbidity
Specific co-morbidities and physical health

- Angina Pectoris
- Hartfalen
- Hartinfarct
- COPD
- Diabetes
- Leverziekten
- Nierziekten
- Kanker