Correlation between HIV-Index (HIVI), Protective Index (PI) and frailty in an HIV ageing population.

I. Franconi¹, O. Theou², L. Wallace², A. Malagoli¹, R.J.A.H.E. Eendebak², K. Rockood², C. Mussini¹ and G. Guaraldi¹

1. University of Modena and Reggio Emilia, Modena, Italy
2. Dalhousie University, Halifax, Nova Scotia, Canada.

Dr. Iacopo Franconi has no financial relationships with commercial entities to disclose.
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Background

➢ Meadian age of 56.6 years in 2030
➢ 73% of PLWH will be over 50 years old
➢ 28.8% of PLWH will have 3 or more NICMs

Geriatric Syndromes in Older HIV-Infected Adults

"...We have found evidence of clinical ageing in HIV adults who were younger than the typical «geriatric» population[...]"

"Aging-related syndromes can be seen among HIV-infected adults before they are chronologically elderly”

Geriatric-HIV Medicine Is Born

"[...] Assessment of NICMs and MM alone does not reflect the complexity of Ageing [...] geriatric screening including assessment for Frailty and CGA are recommended[...] HIV and Ageing stigma [...] have been associated with inequalities in social, economic and political power»
Background-2

A standard procedure for creating a frailty index
Samuel D Searle¹, Arnold Mitnitski¹,²,³, Evelyne A Cahbauer⁴, Thomas M Gill⁴ and Kenneth Rockwood*¹,²,⁵

FI 72 items:
✓ Blood tests
✓ 8 NICMs
✓ BMI
✓ CES-D
✓ ADL
✓ IADL
✓ ASMi
   (Sarcopenia)
✓ Nutrition
✓ EQ5D5L
✓ Geriatric syndromes

HIV-Index (HIVI)
- CDC Classification
- CD4+ Nadir
- Duration of HIV
- time between diagnosis and ARV start
- 3rd line of ARV or more
- HIV/AIDS related cancers
- lipodystrophy

Protective Index (PI)
- ethnicity
- level of education
- profession
- income
- physical activity
- injection drug use (past or current)
- marital status
- Domestic partnership
- alcohol use
- smoking habit
Objective

Evaluate correlations between HIV-Index (HIVI), Protective Index (PI) and frailty in an HIV ageing population
Methods-1

Cross sectional study
From September 20\textsuperscript{th} 2016 to 17\textsuperscript{th} November 2017
Modena HIV Metabolic Clinic (MHMC)
Data are collected from blood tests, nuclear medicine DXA scan, self-reported surveys, face-to-face interviews and clinical evaluation by physicians, occupational therapists, dieticians and psychologists.
At least one clinical evaluation, able to express written consensus
Approved by Ethical Committee
Methods-2

Frailty: FI > 0.25

Univariate and multivariate linear regression models were performed using both FI and natural logarithm of FI as dependent variables, and HIVI and PI as independent variables individually, to demonstrate increase of FI score with increase in HIVI and decrease in PI.

Univariate and multivariate logistic regression models, adjusted for age and sex were, run to evaluate association and predictors of frailty among HIV and PI variables and HIVI and PI scores.

SPSS 24 (IBM Corp, Armonk, NY, USA) was used to run all analyses.
Results

- 1565 subjects were included. Mean age 53.15±8.03, 73.9% males.
- Mean FI was 0.19±0.08. Median FI 0.18 (range 0.02-0.55).
- Mean HIVI and PI were 0.48±0.17 and 0.63±0.14 respectively.
- Median HIVI 0.500 (range 0.00-0.92)
- Median PI 0.611 (range 0.22-1.00)
- Multivariate Linear regression analysis HIVI and FI
  - B-non standardized (0.068±0.014, p<0.001)
- Multivariate Linear regression analysis PI and FI
  - B-non standardized (-0.136±0.016, p<0.001)
- HIVI and PI are predictors of Frailty at multivariate logistic regressions (age/sex adjusted):
  - HIVI Odds Ratio: 1.020 p<0.001 [IC(1.010;1.031)]
  - PI OR 0.974, p<0.001 [IC(0.963;0.986)]
## Results-2

### Predictors of Frailty among HVI and PI Variables

<table>
<thead>
<tr>
<th>HIV Variables</th>
<th>OR</th>
<th>significance</th>
<th>CI 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDC-classification*</td>
<td>2.20</td>
<td>p &lt; 0.001</td>
<td>[1.58; 3.05]</td>
</tr>
<tr>
<td>CD4 Nadir</td>
<td>1.26</td>
<td>P=0.201</td>
<td>[0.884; 1.80]</td>
</tr>
<tr>
<td>Duration of HIV (years)*</td>
<td>3.86</td>
<td>p &lt; 0.001</td>
<td>[2.39; 6.24]</td>
</tr>
<tr>
<td>Time from diagnosis to ART*</td>
<td>1.65</td>
<td>p = 0.002</td>
<td>[1.21; 2.25]</td>
</tr>
<tr>
<td>AIDS malignancy</td>
<td>0.69</td>
<td>P=0.238</td>
<td>[0.38 ; 1.27]</td>
</tr>
<tr>
<td>Lipodystrophy*</td>
<td>1.86</td>
<td>P=0.001</td>
<td>[1.30 ; 2.65]</td>
</tr>
<tr>
<td>3rd line of ART or more*</td>
<td>1.47</td>
<td>P=0.035</td>
<td>[1.03; 2.10]</td>
</tr>
<tr>
<td>CD4+absolute count*</td>
<td>1.66</td>
<td>P=0.001</td>
<td>[1.24; 2.30]</td>
</tr>
<tr>
<td>HIV-VL undetectability</td>
<td>1.10</td>
<td>P=0.711</td>
<td>[0.67,1.79]</td>
</tr>
<tr>
<td>CD4/CD8</td>
<td>1.24</td>
<td>P=0.15</td>
<td>[0.93;1.66]</td>
</tr>
<tr>
<td>HVI*</td>
<td>1.025</td>
<td>p&lt;0.001</td>
<td>[1.02,1.03]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PI variables</th>
<th>OR</th>
<th>P value</th>
<th>CI 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity</td>
<td>1.17</td>
<td>p=0.780</td>
<td>[0.38; 3.63]</td>
</tr>
<tr>
<td>Education year*</td>
<td>0.24</td>
<td>p&lt;0.001</td>
<td>[0.13;0.46]</td>
</tr>
<tr>
<td>Profession*</td>
<td>0.41</td>
<td>p&lt;0.001</td>
<td>[0.28;0.61]</td>
</tr>
<tr>
<td>Risk IDU*</td>
<td>0.49</td>
<td>p&lt;0.001</td>
<td>[0.37;0.65]</td>
</tr>
<tr>
<td>Marital status</td>
<td>1.14</td>
<td>p=0.427</td>
<td>[0.83,1.55]</td>
</tr>
<tr>
<td>Domestic partnership</td>
<td>1.10</td>
<td>p=0.557</td>
<td>[0.802;1.51]</td>
</tr>
<tr>
<td>Income*</td>
<td>0.26</td>
<td>p&lt;0.05</td>
<td>[0.11;0.62]</td>
</tr>
<tr>
<td>Alcohol</td>
<td>1.65</td>
<td>p=0.077</td>
<td>[0.95;2.81]</td>
</tr>
<tr>
<td>Smoking*</td>
<td>0.44</td>
<td>p&lt;0.001</td>
<td>[0.32;0.61]</td>
</tr>
<tr>
<td>Gym*</td>
<td>2.94</td>
<td>p&lt;0.001</td>
<td>[2.22; 3.90]</td>
</tr>
<tr>
<td>PI*</td>
<td>0.972</td>
<td>P&lt;0.001</td>
<td>[0.961;0.983]</td>
</tr>
</tbody>
</table>
Results-3

Mean F1 scores according to different PI and HIVI groups

PI groups according to HIVI scores
Discussion

Higher HIVI and Lower PI are associated with Frailty
HIVI and PI can predict Frailty

**Study limitations:**
- Cross sectional
- No cut-off points for HIVI and PI
- Few variables for HIVI and PI
- Validation with other clinical outcomes (deaths, Hospital admissions institutionalization, disability etc.)
Acknowledgements

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