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positive BRAIN HEALTH NOW

Frailty is a Unique Entity for People Living with HIV

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for the Positive Brain Health Now investigators

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Rationale for this Research Topic

As life expectancy for people with HIV increases, frailty emerges as an impediment to active ageing. Frailty occurs almost a decade earlier for people with HIV and its prevalence is 4 to 5 times higher than the general population.

The causes of frailty are commonly argued to be the HIV infection, co-morbidities, and lifestyle factors.
It is possible that the reasons for frailty are less from the HIV infection and more from co-morbidity and lifestyle factors.

It is important to understand different pathways of frailty as each mechanism may be modifiable and hence targets for intervention(s). However, there is a lack of evidence to help untangle the unique contribution of factors on frailty.

Pathway of this Research

The **objective** is to estimate the relative contribution of co-morbidity and HIV-related factors to the classification of frailty.

The **source of data** is from the ongoing Positive Brain Health Now (BHN) cohort involving 856 persons living with HIV recruited between 2014 and 2016 from five clinics in Canada.

The **outcome**, frailty, is operationalized based on Fried's Phenotype criteria (≥3/5), using self-reported items capturing slow gait speed, decreased grip strength, exhaustion, low physical activity, and indicator of sarcopenia measured with BMI (<21).

The **comorbidities** were hypertension, cancer, arthritis, osteoporosis, stomach ulcer, thyroid, myocardial infarction, angina, diabetes, and kidney, lung, liver, peripheral vascular diseases.

Analysis and Findings of this Research

85 of the 845 people (10.4%) showed frailty: 66 (78%) with co-morbidity and 19 (22%) without. 10 years earlier than general population

Criteria to compare these 85 people with or without co-morbidities were: (i) absolute difference greater than ½ SD in means for continuous variables; (ii) absolute difference ≥10% in proportions for categorical variables.

Factors that showed association greater than ½ SD in means or greater than 10% difference in proportions

	With co-morbidity (n=66)	Without co-morbidity (n=19)	Absolute Difference [95% CI] without vs. with co-morbidity
	N (%) / Mean (SD)	N (%) / Mean (SD)	
Age	54.8 (7.3)	49.3 (6.1)	**-5.5 [-1.8 to -9.1]**
Year of diagnosis: before 1997*	41 (62.1%)	9 (47.4%)	**-14.7% [-9.4% to 37.5%]**
Nadir CD4 cell count ≤ 200	32 (50.0%)	13 (72.2%)	**22.2% [-3.8% to 41.6%]**
VACS Index (0-164;>34 is increased risk mortality)	24.1 (16.3)	14.3 (12.3)	**-9.8 [-20.5 to 0.9]**
BMI<21 kg/m^2	18 (27.3%)	3 (15.8%)	**-11.5% [-12.2% to 27.1%]**
Slow gait speed: any limitation walking one block	25 (37.9%) /	11 (61.1%)	**23.2% [-44.7% to 2.3%]**
Exhaustion: all/most/a good bit of the time	46 (73.0%)	18 (94.7%)	**21.7% [-0.1% to 34.3%]**

- Frail people without co-morbidity were
  - younger by 5.5 years
  - more likely to have experienced a greater immunological burden from HIV as demonstrated by a lower Nadir CD4 count ≤ 200 (72.2% vs. 50%).
- In frail people without co-morbidity, frailty was manifested most often by
  - limitations in walking even short distances
    - proxy for slowness in gait speed
  - frequent experience of exhaustion

Lessons Learned from this Research

Two groups of people with frailty have emerged from this analysis:

- those frail who failed tests that form the Frailty Phenotype potentially because of co-morbidity and
- those frail probably from the effects of HIV.

Clinically, they are likely to be discernible, however, in research they fall under the same umbrella term “frail”.

Pathways to frailty in people living with HIV who have no additional co-morbidity are of interest for future research.

This study supports that, while co-morbidities lead to frailty, HIV-specific frailty is a small but unique entity.