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Multicomponent Exercise Associated With a Healthier Gut Microbiota Profile in Older Adults With HIV

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BACKGROUND

Multicomponent Exercise has been shown to modulate the gut microbiota leading to changes that may contribute to a less inflammatory and more eubiotic microbial profile. However, there is limited evidence on the effects of exercise on the gut microbiota in older adults living with HIV (OAWH). In this 48-week longitudinal study, we evaluated the changes in the gut microbiota through metagenomic whole genome shotgun (mWGS) sequencing of participants after undergoing 48 weeks of a Multicomponent Exercise Program (MEP).

METHODS

- Sedentary adults aged 50 and over, with and without HIV, were included in a prospective longitudinal study with intervention, a MEP, and with 12-, 24- and 48-week follow-up.
- Clinical variables were obtained as well as adherence to the MEP defined as good (>50%) or poor (<50%). Stool samples were collected at each visit.
- mWGS sequencing of 129 faeces DNA and analysed the taxonomy and functional annotation by Metastats and LEfSe analysis was perfome.
- For longitudinal analysis, we used EXPLANA bioinformatics program, threshold 100 and boluta p-value: 0.05.

Table 1

	VIH -	VIH +
N	20	40
Sex. Female (%)	25	22.5
Age. Median (p25-p75)	58.5 (53-56.2)	56 (53-61)
Living. N (%)	10 (50)	20 (50)
Alone	10 (50)	11 (27.5)
With partner	-	9 (22.5)
Others		
Medications. Median (p25-p75)	2 (0-4)	3.5 (2-4)
BMI. Median (p25-p75)	26.7 (24.2-30.2)	26.3 (22.7-30.2)
MNA-SF. N (%)	2 (10)	9 (22.5)
8-11	18 (90)	31 (77.5)
12-14		
Pain. N (%)	12 (60)	26 (65)
Falls. N (%)	4 (20)	9 (22.5)
SPPB. Median (p25-p75)	11 (11-12)	11 (10-12)
Frailty. N (%)	8 (40)	10 (25)
Robust	12 (60)	26 (65)
Prefrail		4 (10)
Frail		
Depression. N (%)	2 (10)	13 (32.5)

Baseline characteristics of participants. We included 60 participants, 40 OAWH. Median age was 56.5 years. 23.3% were women. All participants with HIV were virologically controlled (**Table 1**).

MEP could positively modulate the gut microbiota in OAWH potentially promoting a healthier and less inflammatory microbial environment.

CONCLUSIONS

A MEP could positively modulate the gut microbiota in OAWH potentially promoting a healthier and less inflammatory microbial environment. This highlights the potential role of regular physical activity as a strategy to improve gut health and overall well-being in older populations, regardless of HIV status.

RESULTS

- At baseline, significant differences in the gut microbiota composition were observed when comparing different groups: a relative abundance of *Firmicutes, Prevotella*, and r*Dialister* was significantly higher in men compared to women ($p<0.05$) and similarly, Catenibacterium was found to be increased in older adults with HIV (OAWH) ($p<0.05$). Furthermore, we globally observed high relative abundance of some genus related with inflammation and obesity as *Collinsella spp*. ($p<0.05$) in OAWH. Differences after 48 weeks of MEP highlighted a significant increase in bacterial genus such as *Bacteroides, Prevotella*, and *Bifidobacterium* and significant decrease of family Coriobacteriaceae in OAWH compared to non HIV participants (**Figure 1**).
- SHAP summary beeswarm plots of feature influence on the machine learning prediction of response values through EXPLANA bioinformatic tool. frailty in HIV+ participants is the main variable in this model, it shows an inverse contribution to MEP adherence, as does the bacterial genus *Desulfotalea*, a pathogenic bacterium. In contrast, the genus *Aquabacterium* and the family Lachnospiraceae show a direct contribution to MEP adherence, bacteria associated with the production of SCFAs (**Figure 2A**). HIV- participants do not show large microbial contribution to the MEP, with *Desulfocucumis* showing an inverse contribution to the multicomponent exercise programme (**Figure 2B**).

Figure 1

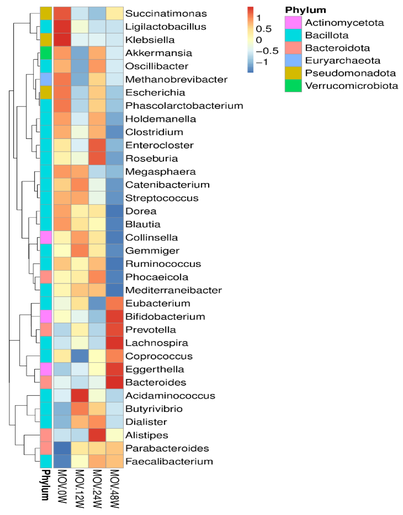
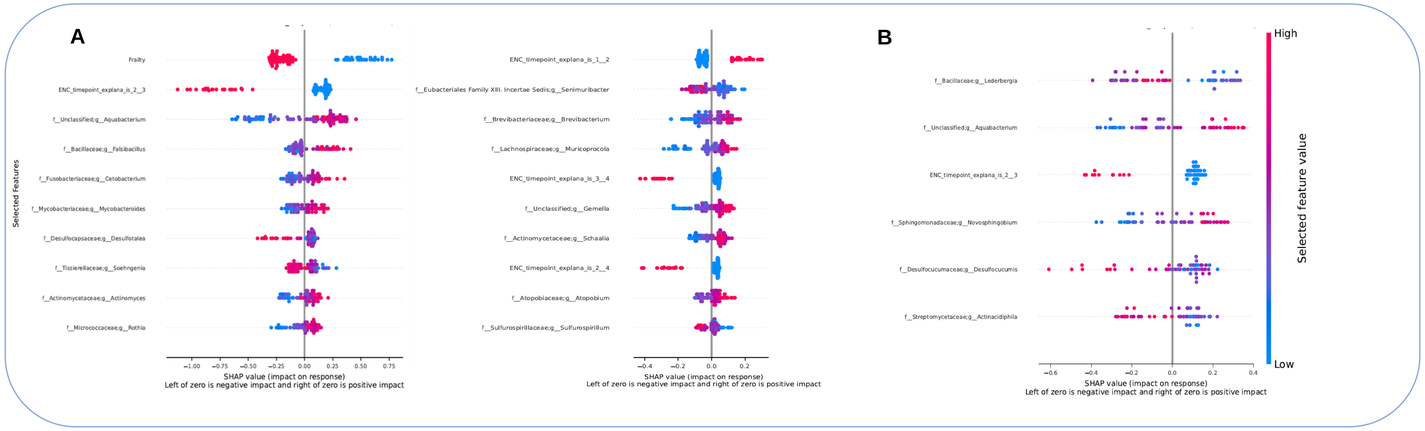


Figure 2



ADDITIONAL KEY INFORMATION

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