

RESEARCH BASED TEMPLATE

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Clustering of longitudinal CD4+ T cell count trajectories for people living with HIV.

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Background:

Latently infected cells that make up the HIV reservoir are a major barrier for a HIV cure for people living with HIV (PHIV) on antiretroviral therapy (ART). This study looks to investigate and cluster CD4+ T cell trajectories of participants following ART initiation, based on similar trajectories. Using different clustering approaches, we aim to identify distinct sub-groups of CD4+ T cell recovery and explore differences to distinguish those clusters.

Methods:

All available retrospective CD4 count data and ART regimens were obtained from hospital records from a pilot cohort of 40 PHIV, with additional data obtained from biobanks of 30 other PHIV. Two approaches, hierarchical clustering (algorithm-based approach), and a latent class mixed effect (LCME) model (model-based approach), were used to investigate the ideal number of clusters of similar CD4 trajectories, over the first 5 years since ART initiation.

Results:

The hierarchical clustering model was able to split participants into two clusters, with 28 participants in cluster 1, and 35 participants in cluster 2. The predicted mean CD4 trajectory in both clusters increases over time, however the mean trajectory of cluster 1 starts higher and recovers at higher CD4 counts compared to cluster 2. Initial results from the LCME model were also able to create clusters of CD4 trajectories that differed to the hierarchical clustering model.

Conclusion:

Clusters of CD4 trajectories after ART initiation were identified under the hierarchical clustering model. The LCME model shows potential as an alternative clustering method, with further refinement of model structures currently underway to identify better clusters. This will involve refining the non-linear fitting of the data, as well as

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including covariates such as age and ART regimen taken over time. Larger CD4+ datasets may also be studied in the future to investigate findings further, along with using alternate clustering approaches.

Disclosure of Interest Statement:

JSYL receives honoraria for participation in Advisory Boards and Consultancy roles for ViiV Healthcare and Gilead Sciences. She received an investigator-initiated research grant from Merck, Sharp and Dohme to conduct this work. SRL receives honoraria for participation in scientific advisory boards for Gilead Sciences, Merck and AbbVie. She has received funding for an investigator initiated clinical trial from Gilead Sciences (unrelated to this work). IW has worked as an investigator on commercial and investigator-initiated studies with funding from institutions from Gilead, ViiV, MAS, Moderna and CSL. IW has worked on advisory boards for ViiV and Gilead. IW has received educational support from Gilead, ViiV, MSD and Pfizer.