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Prevalence and Correlates of HPgV Infection among PWID with HIV Infection in India

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BACKGROUND

Human Pegivirus (HPgV) shares overlapping transmission routes with HIV as it is transmitted through percutaneous and sexual routes. Previous studies have shown that HPgV infection is associated with reduced disease progression among HIV-infected individuals. However, most of these data are from non-clade C HIV infection. We estimated the prevalence of HPgV infection and its association with disease progression among HIV-infected people who inject drugs (PWID) in Chennai, India.

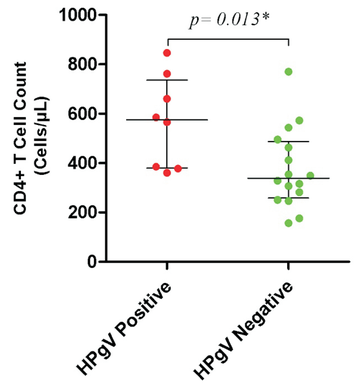

Figure 1: Graphical plot showing the comparison of CD4+ T cell counts between ART treated HPgV positives (red circles) and HPgV negatives (green circles) at 24 months. *P*-value (two-tailed) based on the Mann-Whitney rank sum test and the error bars show the median with the interquartile range.

MATERIALS & METHODS

We tested stored plasma samples from 154 HIV-infected PWID who were prospectively enrolled and followed up as part of a community-based cohort of PWID in Chennai, India (the Chennai HIV, HCV and EeRal study (CHHEERS)) between 2012 - 2016. Samples from the baseline study visit were screened for detecting HPgV infection using qualitative PCR targeting conserved 5'UTR as described by Blackard JT et al., 2014. Baseline characteristics of persons who were positive and negative for HPgV infection were compared using the Fisher's exact test for dichotomous or categorical characteristics and the Mann-Whitney rank sum test for continuous characteristics, with a particular focus on HIV disease progression parameters including CD4, HIV-1 plasma RNA viral load, and antiretroviral therapy (ART).

RESULTS

All PWID in this cohort (infected with HIV-1) were male and the median age was 40 (interquartile range [IQR]:36–43). The median CD4 cell count was 357 (IQR: 226-489), (47% were on first-line HAART, of whom 38% had virological suppression (HIV-1 RNA <40 copies/mL). The prevalence of HPgV infection was 23% (95% confidence interval: 17-31%). There were no statistically significant differences between HPgV positive and HPgV negative persons at baseline in terms of HIV viral load (80% and 78% with detectable viral load, respectively; p = 0.92) and CD4 cell counts (median 357 and 347, respectively, p = 0.77) even after accounting for ART (Table 1). However, among HPgV co-infected participants on HAART, absolute CD4 cells reconstitution was higher at 24 months (p=0.01) (Figure 1).

CONCLUSIONS

We observed a high prevalence of co-infection with HPgV in a cohort of HIV-infected PWID in India. The HPgV infected patients exhibited a superior response to ART with better recovery of CD4 cells. Further evaluation of these relationships in a larger sample size might shed light on the role of HPgV infection among PWID with HIV infection.

Table 1: Baseline characteristics of 154 HIV-1 infected individuals by HPgV RNA status

n (column %) or median (IQR)	HPgV RNA negative (n=118)	HPgV RNA positive (n=36)	*P* value*	Total (n=154)
Median age, years	41 (37 - 44)	37 (33 - 43)	0.019	40 (36 - 43)
Injection duration, years	16 (11 - 20)	14 (11 - 17)	0.095	15 (11 - 20)
Injection drug use in prior 6 months	22 (18.6)	3 (8.3)	0.198	25 (16.2)
History of sharing of needles/syringes	106 (89.8)	33 (91.7)	1.000	139 (90.3)
Sharing needles/syringes in prior 6 months (among those injecting in prior 6 months)	3 (13.6)	1 (33.3)	0.422	4 (16.0)
HIV characteristics				
Currently on antiretroviral therapy	59 (50.0)	13 (36.1)	0.182	72 (46.8)
CD4 count, cells/µL <200 200 - 349 350 - 499 >500	 22 (18.6) 36 (30.5) 36 (30.5) 24 (20.3)	 6 (16.7) 12 (33.3) 7 (19.4) 11 (30.6)	 0.460	 28 (18.2) 48 (31.2) 43 (27.9) 35 (22.7)
Median CD4 count, cells/µL	357 (233 - 477)	347 (210 - 527)	0.770	357 (226 - 489)
Median CD4 %	20 (16 - 25)	20 (16 - 23)	0.542	20 (16 - 25)
HIV-1 plasma viral load, copies/mL Undetectable 40 - 1000 1000 -10000 >10000	 21 (17.8) 23 (19.5) 17 (14.4) 54 (45.8)	 7 (19.4) 5 (13.9) 4 (52.8) 19 (52.8)	 0.917	 28 (18.2) 28 (18.2) 21 (13.6) 73 (47.4)
HCV and HBsAg Status				
Hepatitis C Infection (HCV) Antibody negative Antibody positive, RNA negative Antibody positive, RNA positive	 35 (29.7) 17 (14.4) 64 (54.2)	 11 (30.6) 3 (8.3) 22 (61.1)	 0.816	 46 (29.9) 20 (13.0) 86 (55.8)
HBsAg Positive	9 (7.6)	2 (5.6)	1.000	11 (7.1)

*Exact test for categorical variables and Kruskal-Wallis rank test for continuous variables.

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