

HIV CARE OUTCOMES AMONG SUBSTANCE USERS IN PUERTO RICO FOLLOWING HURRICANE MARIA

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Background

- In 2017, Hurricane Maria (HM) caused devastation to the island of Puerto Rico and its residents. The health impacts of this storm on vulnerable populations, including people living with HIV (PLWH), are unknown.
- Based on preliminary data from an ongoing cohort study in San Juan, Puerto Rico, we examined the effects of HM on HIV care outcomes among PLWH with a history of substance use.

Methods

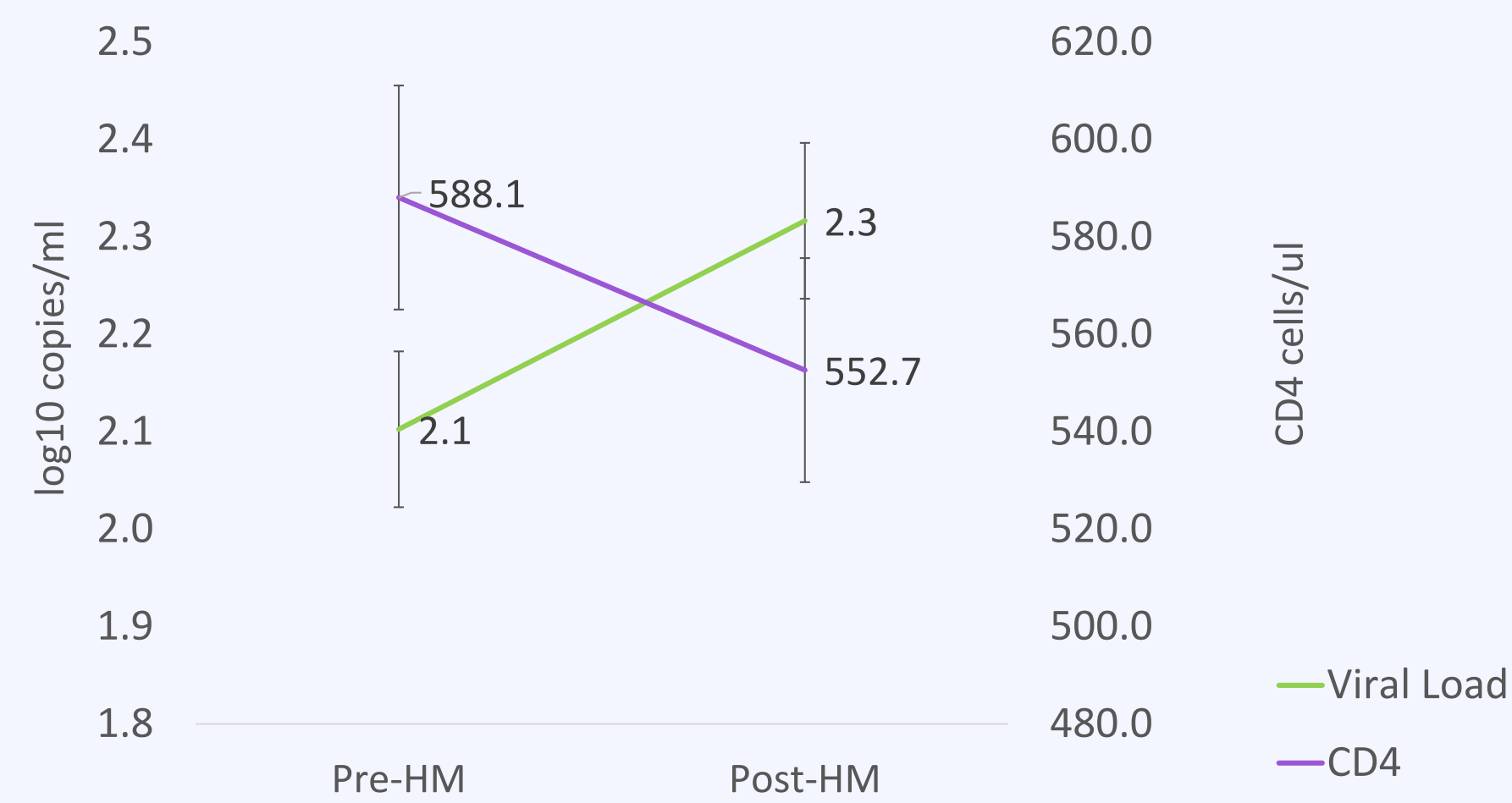
- From 2014 to 2016, we recruited a cohort of PLWH with a history of substance use from the San Juan Metropolitan Area.
- We conducted a social and behavioral assessment through a computer-assisted personal interview and collected blood to measure CD4 and viral load at the baseline and 6-month follow-up visits, including time points pre- and post-HM.
- Hypotheses:
 - HM had a significant impact on participants' HIV care outcomes (e.g., increased viral load, decreased CD4 counts).
 - HM differentially affected participants' HIV care outcomes by their pre-HM viral suppression status.
- Additional indicators assessed include: currently homeless, substance use in the past 6 months (severe drug use, types of illicit drug use, and hazard drinking), depression, physical abuse/interpersonal violence, access to care, social support, conflictual social interactions, medication adherence, and service utilization in the past 6 months.
- The impact of HM was assessed by generalized estimating equation (GEE) models, particularly:
 - M1.** Pre- and post-HM demographics and HIV care outcomes comparisons (Table 2).
 - M2.** Pre- and post-HM demographics and HIV care outcomes comparisons, stratified by viral suppression pre-HM status (Table 3).
 - M3.** A full model to predict viral suppression, adjusting for HM and other factors (described in the Results section).

Results

Table 1. Baseline Sample Characteristics (n=219)

	Baseline N	%
AGE (mean, sd)	47.25	8.8
Gender (Men)	162/219	74%
Income (≤\$5,000)	196/219	89%
Health insurance	192/219	88%
Education (≥high school)	146/219	67%
Ever incarcerated	166/219	76%
History living in the mainland US	118/215	55%
Homeless	75/219	34%
Severe drug use (DAST10≥6)	96/219	44%
Depression	143/219	65%

Figure - HIV Care Outcomes Pre- and Post-HM



- Viral suppression (<200 copies/ml) was 71% pre-HM compared to 65% post-HM (Table 2).
- The mean post-HM viral load was 2.3 log10 copies/ml (se=0.09), significantly higher compared to pre-HM (2.1 log10 copies/ml, se=0.08). CD4 counts also were significantly lower post-HM (mean=552.7 cells/ul, se=23.2) compared to pre-HM (mean=588.1 cells/ul, se=24.7) (Figure).
- The access to care scale also showed a 22% reduction at post-HM compared to pre-HM (IRR=0.78, 95% CI 0.66-0.92) (Table 2).
- Homelessness and number of hospital/clinic/outpatient visits also showed a border line significant difference comparing post- and pre-HM (Table 2).

Table 2. Pre- and Post-HM Demographic and HIV Care Characteristics

	Pre-HM %	Post-HM %	IRR (ref=Pre-HM)	95% CI
Homeless	14%	18%	1.29	0.97 1.72
Severe drug use (DAST10≥6)	22%	19%	0.85	0.68 1.07
Illicit drug use in last 6 month	48%	48%	1.00	0.87 1.15
Marijuana	19%	19%	1.00	0.77 1.29
Crack Cocaine	8%	6%	0.78	0.49 1.23
Powder Cocaine	6%	5%	0.85	0.44 1.63
Heroin and Cocaine	18%	18%	1.03	0.83 1.27
Heroin only	4%	3%	0.75	0.31 1.83
Hazardous Drinking (AUDIT10≥8)	13%	17%	1.32	0.90 1.93
Depression	48%	45%	0.92	0.78 1.09
Abuse/interpersonal violence count	1.76	1.71	0.97	0.90 1.04
Viral suppression	71%	65%	0.91	0.85 0.99
Viral Load, log10 copies/ml	2.1	2.32	1.11	1.04 1.17
CD4, cells/ul	588.1	552.7	0.94	0.90 0.98
Access to Care	4.09	4.00	0.78	0.66 0.92
Social Support	6.57	6.36	1.02	0.97 1.07
Conflictual Social Interactions	1.82	1.63	0.94	0.84 1.04
% Medication taken in past month	2.48	2.22	1.01	0.96 1.06
Service Utilization in the past 6 months				
# of nights in the hospital	5.08	6.32	1.34	0.61 2.97
# of hospital/clinic/outpatient visit	3.87	4.83	1.47	0.99 2.19
# of community clinic visit	1.60	1.31	0.68	0.41 1.12
# of private doctor visit	0.19	0.43	2.01	0.25 16.06
# of overall doctor visit	4.97	4.83	1.13	0.87 1.47

- Pre-HM virally suppressed participants showed significantly less favorable HIV care outcomes (viral load and CD4) and reduced access to care at post-HM compared to pre-HM (Table 3).
- Pre-HM not virally suppressed participants had significantly less access to care, medication adherence, conflictual social interactions, but more number of hospital/clinic/outpatient visits at post-HM compared to pre-HM (Table 3).
- After controlling different factors, HM (aIRR=0.92, 95% CI 0.85-0.99), age (aIRR=1.13, 95% CI 1.03-1.25) and health insurance (aIRR=1.6, 95% CI 1-2.57) were independent predictors of viral suppression.

Results

Table 3. Pre- and Post-HM Demographic and HIV Care Characteristics by Viral Suppression Pre-HM

	Not Virally Suppressed Pre-HM (n=63)			Virally Suppressed Pre-HM (n=153)		
	(ref=Pre-HM)	IRR	95% CI	IRR	95% CI	
Viral Load, log10 copies/ml	0.98	0.90	1.06	1.24	1.15	1.34
CD4, cells/ul	0.99	0.89	1.11	0.93	0.89	0.98
Access to Care	0.73	0.55	0.97	0.81	0.66	1.00
Conflictual Social Interactions	0.84	0.73	0.98	1.00	0.88	1.13
% Medication taken in past month	0.86	0.77	0.98	1.04	0.99	1.10
Service Utilization in the past 6 months						
# of hospital/clinic/outpatient visit	1.71	1.02	2.88	1.43	0.90	2.26

No significant association was shown for HM and homelessness, severe drug use, illicit drug use, hazardous drinking, depression, abuse/interpersonal violence count, and other service utilizations in the past 6 months for participants who were non-virally suppressed or virally suppressed pre-HM.

Conclusion

- HM had a significant impact on participants' HIV care outcomes.
- Pre-HM virally suppressed and pre-HM non-virally suppressed participants were differentially affected by HM.
- The impact of HM on PLWH with a history of substance use in San Juan, Puerto Rico was mixed. Further research should seek to understand divergent paths following natural disasters for vulnerable populations.

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