



Seminal Shedding of CMV and HIV Transmission among Men who Have Sex With Men (MSM)

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Background

- Almost all HIV-infected MSM in San Diego are seropositive for cytomegalovirus (CMV) and approximately half shed CMV DNA in their genital tract at any given time.
- Seminal CMV shedding might be associated with detectable HIV RNA in semen, enhanced HIV replication, up-regulation of CCR5, and ultimately with HIV transmission.

Objective

- **To estimate the population attributable risk (PAR) of genital CMV shedding to the number of HIV transmissions among MSM living in San Diego, CA.**
- **To compare this estimate to the PAR for other sexually transmitted infections (STI) like gonorrhea, syphilis, Chlamydia and herpes simplex virus type 2 (HSV-2).**

Methods

- We estimate relative risks for CMV shedding, bacterial STI and HSV-2 based on the number of transmissions observed in two previous studies of 47 epidemiologically and phylogenetically linked MSM pairs where the potential source partner was HIV-infected while the potential recipient partner was initially HIV-uninfected (1, 2).
- PAR estimates were calculated by combining these estimates with the risk factor prevalences of seminal CMV shedding, bacterial STI, HSV-2 serostatus, and incidence of HIV among MSM in San Diego.

Results

- Based on data summarized in table 1, we calculate that over a third of HIV transmissions among MSM in San Diego (37%) could be attributable to CMV shedding (125 transmission events), compared to no more than 21% for bacterial STI (70 events) and 17% for HSV-2 (58 events), see figure 1.

Table 1: Summary of data connecting CMV shedding to HIV transmission among MSM in San Diego

Newly diagnosed HIV infections in San Diego country among MSM (N per year)	339
Frequency of seminal CMV shedding among MSM (%)	51.3%
Frequency of HIV transmission in partnerships with CMV shedding detected in the potential source partner (N [%])	16/30 (53.3%)
Frequency of HIV transmission in partnerships with CMV shedding not detected in the potential source partner (N [%])	4/16 (25%)
Estimated number of new HIV infections attributable to CMV (%)	125 (36.8%)
Frequency of bacterial STI among MSM (%)	15%
Frequency of HIV transmission in partnerships with bacterial STI in the potential source partner (N [%])	5/5 (100%)
Frequency of HIV transmission in partnerships without bacterial STI in the potential source partner (N [%])	15/41 (37%)
Estimated number of new HIV infections attributable to bacterial STI (%)	70 (20.6%)
Frequency of HSV-2 seropositivity among MSM (%)	41%
Frequency of HIV transmission in partnerships with positive HSV-2 serology in the potential source partner (N [%])	8/19 (42%)
Frequency of HIV transmission in partnerships with negative HSV-2 serology in the potential source partner (N [%])	7/25 (28%)
Estimated number of new HIV infections attributable to HSV-2 (%)	58 (17.1%)

Conclusions

- **This study supports the hypothesis that CMV shedding among MSM contributes to a large proportion of HIV transmissions in San Diego.**
- **Such contribution seems to be larger than that of bacterial STI and HSV-2.**
- **Confirming this hypothesis would require a large randomized placebo-controlled clinical trial, which will be difficult with currently approved anti-CMV therapies given their inherent toxicities, but newer anti-CMV therapies and vaccines may hold promise.**

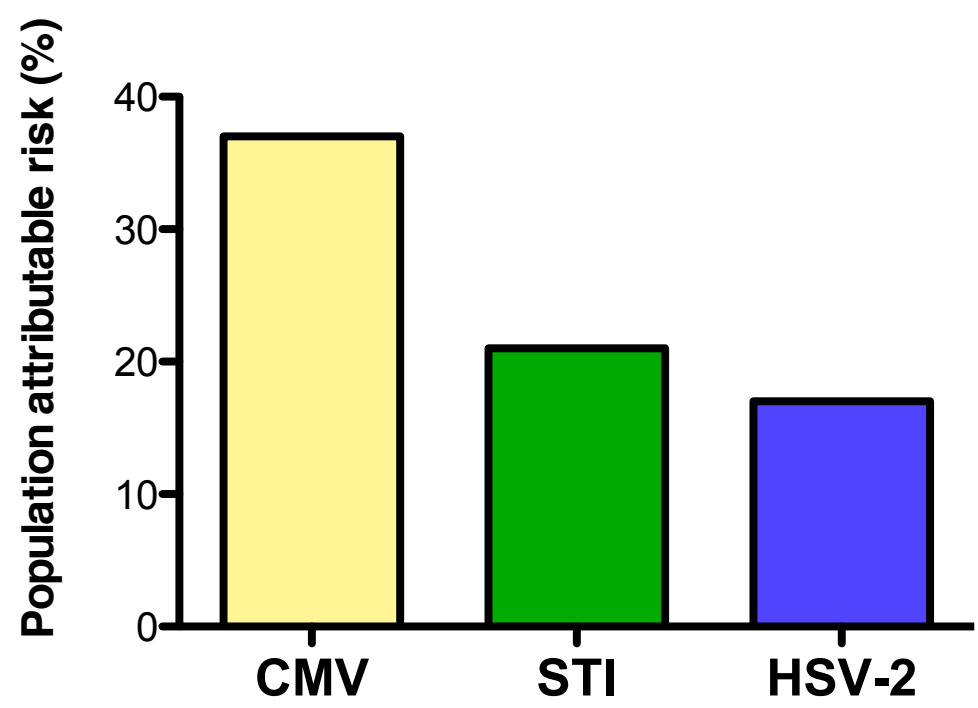


Figure 1.

Population attributable risk (PAR) of CMV shedding (yellow), bacterial STI (green) and HSV-2 infection (blue) to the number of HIV transmissions among MSM in San Diego

References

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