**HIGH CONNECTIVITY IS ASSOCIATED WITH HIV CO-INFECTION IN THE TRANSMISSION NETWORK OF PEOPLE WITH RECENT HEPATITIS C VIRUS INFECTION IN AUSTRALIA**

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**Introduction:** Molecular epidemiology can identify individuals within a network more likely to transmit infection, enabling more targeted delivery of treatment and prevention strategies. This study aimed to reconstruct a local HCV transmission network and identify factors associated with higher connectivity among three studies of people with recent HCV infection in Australia recruited from 2006 to 2013.

**Methods:** Sequence data from participants with an available HCV sequence (Core-E2 region) at time of HCV detection were analysed to infer a partial local transmission network. The network was constructed by linking any pair of sequences whose divergence was ≤4% (TN93 distance measure). Connectivity was defined as the number of links an individual had to other individuals in the network. Four degree distributions (Negative Binomial, Pareto, Waring and Yule) were compared using the Bayesian Information Criterion. Logistic regression was used to identify factors associated with being highly connected (>3 links) in the network.

**Results:** Among 234 participants (ATAHC, n=123; HITS-p, n=91; HITS-c, n=20), 60% had recently injected drugs and 17% had HCV/HIV co-infection. Overall, 64% (n=151) were un-linked, 21% (n=50) were linked to 1 or 2 individuals and 15% (n=33) were linked to 3 or more individuals. A negative binomial distribution provided the best fit of the degree distribution. Overall, 33% (13/39) of HCV/HIV co-infected participants were highly connected in the network, compared to 10% (20/195) with HCV alone. Being highly connected in the network was associated with HCV/HIV co-infection [odds ratio (OR) 4.77; 95%CI 2.10, 10.89] and being in prison [OR 2.94; 95%CI 0.14, 0.85].

**Conclusion:** These data demonstrate thatsequence data from people with recent HCV infection can be used to characterize highly connected transmission networks. HIV infection and being in prison was associated with higher network connectivity.

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