Standardized Mortality Ratios Among Drug Users in Amsterdam Differ by HCV and HIV Infection Status

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Background: The start of a major heroin epidemic in the 1960s was followed by an hepatitis C (HCV) and HIV epidemic among drug users (DU). Therefore, harm reduction interventions (e.g. needle exchange programs) were introduced in Amsterdam during the 1980s. Over time effective HIV and HCV treatment also became available. We hypothesize that because of these health related interventions, DU have reached mortality rates more comparable to the general Dutch population in recent calendar periods. Hence, we investigated temporal trends in mortality rates among DU compared to the general population using Standardized Mortality Ratios (SMR). We also explored whether SMR differed by HIV/HCV infection status and cause of death.

Methodology: Using longitudinal data from the Amsterdam Cohort Studies among 1,263 DU (1985-2012), we estimated all-cause and cause-specific SMR. Four groups of causes of death were addressed: natural, non-natural, liver- and HIV-related deaths. SMR were standardized for calendar period, (<1990; 1990-1996; 1997-2000; 2001-2005 and >2005), age group (20-34, 35-49 and 50-64) and sex. We further obtained the SMR per serological group (HCV mono-, HIV mono-, HCV/HIV co-infected and un-infected for HCV and HIV). Univariable and multivariable Poisson models offsetting the natural logarithm of expected deaths were used to estimate SMR and p-values.

Results: During 18,672 person-years of follow-up, we observed 411 deaths. The all-cause SMR1985-2012 was 14.0 (95%CI=12.7-15.4). There was a significant decline in the all-cause SMR after 1996, ranging from 25.6 during 1990-1996 to 10.8 during 2006-2012 (p<0.001). The highest SMR was observed among HCV/HIV co-infected individuals during 1990-1996 (SMR1990-1996=62.9; 95%CI=51.5-76.9), which declined after this period. The SMR for HCV mono-infected and HCV/HIV un-infected DU declined after 1990-1996 and remained relatively stable afterwards. There was a significant decline in the SMR for non-natural deaths (p<0.001). The SMR for natural and liver-related deaths declined after 1990-1996 and remained stable afterwards. The SMR for HIV-related deaths was the highest during all calendar periods and increased after 1990-1996.

Conclusions: In line with our hypothesis, significant declines in mortality rates were observed among DU compared to the general Dutch population. However, DU are still at increased risk of dying compared to the general population. The decline in the SMR among DU is mainly attributable to the decline in mortality observed among those coinfected with HCV/HIV. However, HIV-related mortality still remains the main cause of death when compared to the general Dutch population. This study reinforces the importance of harm reduction and HCV/HIV treatment to reduce mortality among DU.