HIV prevalence and incidence in people 50 years and older in rural South Africa

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To the Editor: Studies of HIV prevalence in sub-Saharan Africa usually focus on the age group 15 - 49 years.[1] However, estimates of HIV prevalence in older people are required for health policy and planning. The health care and social needs of older HIV-infected individuals differ from younger people; e.g. because of different co-morbidities,[2] different responses to antiretroviral treatment (ART),[3] and the central role of older adults in African households.[4] In South Africa, a nationally representative survey provided first insights into the burden of HIV in the population ≥50 years of age, reporting HIV prevalence in men/women as 10.4%/10.2% (in the age group 50 - 54 years), 6.2%/7.7% (55 - 59 years), and 3.5%/1.8% (≥60 years).[5] However, the South African HIV epidemic is highly heterogeneous[6] with substantial variation by geographic location and ethnic group, limiting the value of national averages.

Method

We measured HIV prevalence in the age group ≥50 years in one of the rural communities hardest hit by the HIV epidemic in South Africa[7-9] and compared it with national estimates. In addition, we estimated HIV incidence in this age group to assess whether HIV infections were acquired only among younger ages or also in older adults. We used data from the longitudinal population-based HIV surveillance conducted at the Wellcome Trust-funded Africa Centre for Health and Population Studies (Africa Centre), University of KwaZulu-Natal (UKZN), in Umkhhanyakude District, northern KwaZulu-Natal.[10,11] HIV status was assessed by ELISA antibody testing of dried blood spot samples in the Africa Centre virology laboratory.[10] Ethics permission for the study was obtained from the Medical Ethics Committee at UKZN. Statistical analyses were performed using STATA 10.0.

The surveillance area is largely rural, but includes a township and peri-urban informal settlements. The resident population consists of about 65 000 Zulu-speaking people.[11] From 2003 to 2006, the annual HIV surveillance was limited to the age groups 15 - 54 years (for men) and 15 - 49 years (for women). From 2007 onwards, all adults ≥15 were eligible to participate. In 2007 (2008), 2 791 (2 684) people ≥50 years of age participated in the HIV surveillance. The crude HIV prevalence among participants was 9.4% (95% confidence interval (CI) 8.4 - 10.6) in 2007, and 9.5% (95% CI 8.4 - 10.6) in 2008.

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Results

Table I shows HIV prevalence estimates by sex and 5-year age group for 2007 and 2008. When we accounted for selective HIV survey non-response by sex and age, the HIV prevalence estimates differed only slightly from the crude estimates: 10.6% in 2007 (11.9% in men and 8.9% in women) and 8.9% in 2008 (12.9% in men and 7.8% in women). A previous study found that controlling for selection on observed factors did not significantly affect HIV prevalence estimates in sub-Saharan Africa;[12] more recent studies demonstrate that selection on unobserved factors can substantially bias results in HIV surveys in the region.[13,14] In the case that people know their HIV status and refuse to participate in an HIV survey if they are HIV-positive, non-response is clearly correlated with unobserved HIV status. Future studies need to investigate the extent to which selection on unobserved factors could have biased the estimates shown here.

We regressed HIV status against demographic and geographic factors in multivariable logistic regression: sex, age (50 - 64 v. ≥65 years old), marital status (currently married; widowed, separated or divorced; single), place of residence (urban or peri-urban v. rural), distance from the participant's household to the nearest primary road (<5 km v. ≥5 km), and distance from the household to the nearest primary health care clinic (<3 km v. ≥3 km). For individuals who participated in the HIV surveillance in 2007 and 2008, we used data from the 2008 surveillance round.

Factors independently associated with positive HIV status were: age ≥65 years (adjusted odds ratio (aOR) 0.20, $p<0.001$); currently married (aOR 0.46, $p=0.001$); being widowed, separated or divorced (aOR 0.47, $p=0.029$); and distance from household to nearest primary road ≥5 km (aOR 0.57, $p=0.028$). Associations with sex, place of residence, and distance to the nearest primary healthcare clinic did not reach significance at the 5% level.

These findings are plausible. Firstly, past studies in this demographic surveillance area found steadily declining HIV prevalence with age in men and women after peak HIV prevalence in the middle age groups,[15] and the age relationship found in this regression extents this pattern to the oldest age groups. Secondly, the length of time that individuals spent without a married partner is likely to be associated with HIV risk factors, such as lifetime partners and number of risky sex acts, and hence with positive HIV status. In turn, at any given age, individuals who are currently married, widowed, separated or divorced will have spent less time without a married partner than individuals who have been single throughout their entire lifetime. Finally, investigations in the Africa Centre demographic surveillance area showed that HIV prevalence in individuals <50 years old decreases with distance from the primary roads, a relationship suggesting that easy access to transport increases the risk of HIV acquisition.[16] We find that this pattern generalises to older populations.

Comparing 5-year age groups, HIV prevalence estimates in older people in this rural setting are considerably higher than national South African estimates (Table I).[5] This is not surprising as the study took place in a community in South Africa with the most severe HIV epidemic among younger people.[7-9] Moreover, local coverage with ART and HIV care has expanded rapidly since 2005. At the end of 2008, an estimated 21% of all HIV-infected individuals in the community were receiving ART.[17] Such high ART coverage probably

Table I. HIV prevalence in people ≥50 years old

	2007 HIV prevalence			2008 HIV prevalence		
Age (years)	*N*	(%)	95% CI	*N*	(%)	95% CI
Women						
50 - 54	417	17.8	14.2 -21.8	434	17.3	13.8 -21.2
55 - 59	416	13.9	10.8 -17.7	375	13.9	10.5 - 17.8
60 - 64	246	9.8	6.4 - 14.7	266	10.2	6.7 - 14.4
65 - 69	328	4.6	2.6 - 7.4	312	4.5	2.5 - 7.4
70 - 74	231	1.7	0.5 - 4.4	229	2.2	0.7 - 5.0
≥75	397	1.5	0.6 - 3.3	364	1.4	0.5 - 3.2
Total female ≥60	1 202	4.1	3.0 - 5.4	1 171	9.0	7.8 - 10.3
Total female ≥50	2 035	8.9	7.7 - 10.2	1 980	4.4	3.3 - 5.7
Men						
50 - 54	156	21.5	14.5 - 27.7	139	29.5	22.1 - 37.8
55 - 59	137	13.9	8.6 - 20.8	133	13.5	8.2 - 20.5
60 - 64	107	14.0	8.1 - 22.1	112	8.0	3.7 - 14.7
65 - 69	125	6.4	2.8 - 12.2	107	5.6	2.1 - 11.8
70 - 74	77	5.2	1.4 - 12.8	70	1.4	0.0 - 7.7
≥75	154	2.6	0.7 - 6.5	143	1.4	0.2 - 5.0
Total male ≥60	463	6.7	4.6 - 9.4	432	4.2	2.5 - 6.5
Total male ≥50	756	10.9	8.7 - 13.3	704	10.9	8.7 - 13.5
Total male and female	2 791	9.4	8.4 - 10.6	2 684	9.5	8.4 - 10.7

N = number of participants in the HIV surveillance; CI = confidence interval.

significantly increased average survival of HIV-infected individuals,[18] which we would expect to lead to increasing HIV prevalence rates.

For HIV incidence estimation, we selected all individuals ≥50 years old who participated at least twice in the HIV surveillance in the period 2006 - 2008, and tested HIV-negative in 2006 or 2007. Among the 1 549 participants (410 men, 1 139 women) included in the sample for HIV incidence analysis, 8 (4 women, 4 men) seroconverted in 1 575 person-years at risk. HIV incidence was 0.5 (95% CI 0.3 - 1.0) per 100 person-years overall; 0.9 in men (95% CI 0.3 - 2.4) and 0.4 in women (95% CI 0.1 – 1.0).

Estimates of HIV incidence in older people are rare, because longitudinal HIV surveys commonly limit data collection to younger adults. We show that HIV incidence among older adults is high in a community in rural KwaZulu-Natal. This finding is important but may not be surprising: global studies have consistently found substantial sexual activity in older men and women.[19]

HIV infection in older people has several distinct features – the speed of disease progression increases with age at infection,[20] older people do not respond as quickly to ART, and age-related conditions may limit HIV treatment options.[21] HIV prevalence is likely to increase in future years as HIV-related mortality in younger HIV-infected people continues to decrease because of ART coverage.[18] Although further studies are urgently needed to identify and understand the specific HIV treatment and prevention needs of older adults in rural South Africa, our findings suggest they should not be ignored.

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Should routine serological screening for HCV be mandatory in HIV/AIDS patients enrolling for HAART in South Africa?

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To the Editor: Globally, an estimated 170 million people (about 3% of the world's population) have been infected with hepatitis C virus (HCV). HCV, a member of the Hepacivirus genus in the *Flaviviridae* family, possesses a single stranded, positive-sense RNA genome of approximately 9.6 kilobase (kb), and is the major cause of chronic hepatitis, cirrhosis and hepatocellular carcinoma.[1] In Africa, HCV prevalence ranges from <3% in South Africa to >20% in Egypt. In South Africa, there is a low prevalence from 0.16% to 1.8%,[2-5] but this is higher in high-risk individuals, e.g. 39.4% in haemophiliacs and 4.8% in chronic dialysis patients.[2]

Some 4 - 5 million people globally are co-infected with HCV and human immunodeficiency virus (HIV).[6] Co-infection with HCV and HIV is common owing to shared routes of transmission – via blood and blood products and sharing of needles for injecting drugs.[7] The introduction of highly active antiretroviral therapy (HAART) dramatically improved the management of HIV patients. However, co-infections with opportunistic infections such as HCV and hepatitis B virus (HBV) remain a major problem. Patients with HIV/HCV co-infection have less immune reconstitution than patients with HIV infection alone,[8] and HAART may worsen the outcome of HCV disease, through enhancement of drug-induced hepatotoxicity.[9]

South Africa has scaled up HAART for treatment of HIV/AIDS in the public health sector since April 2003. However, research programmes to monitor the efficacy of HAART in HIV/AIDS patients co-infected with HBV and HCV do not exist. We have shown that 63% of HIV-positive South African patients initiating HAART have past or present HBV infection.[10] However, few data exist on the burden of HCV prevalence in HIV patients. One study demonstrated a low prevalence of 1.9%,[11] and another a high prevalence of 13.4% in KwaZulu-Natal.[12]

Methods

We investigated the burden of HCV co-infection in HIV-positive patients enrolling for HAART at a tertiary hospital in Pretoria. The study population comprised 653 serum samples stored at -70ºC from adult HIV/AIDS patients who were candidates for HAART at Tshepang Clinic, Dr George Mukhari Hospital (DGMH), Pretoria, from 2004 to 2006. The Research, Ethics and Publication Committee of the University of Limpopo, Medunsa Campus, approved the study. All sera were screened for anti-HCV marker using the AxSYM assays version 3.0 (Abbott Laboratories, North Chicago) following the manufacturer's instructions.

Owing to limited serum volumes to confirm the initial screening results with a second serological assay, all anti-HCV positives (samples with S/CO, i.e. ratio of the sample rate (S) to the cut-off rate (CO) for each sample and control) above 5.23 and preliminary positives (samples with S/CO between 1.00 and 5.00) were subjected to in-house qualitative reverse transcription-polymerase chain reaction (RT-PCR) assay. Viral RNA was extracted from serum with the QIAmp viral mini RNA kits (Qiagen Gmbh, Germany), followed by PCR targeting of the highly conserved 5'-untranslated region (UTR) as previously described with slight modifications.[13] PCR positive samples were sequenced to confirm the specificity of the PCR products (SpectruMedix SCE 2410 Genetic Analysis System, LLC, PA).

Results

Only 1.2% (8/653) of samples were positive for anti-HCV, with S/CO values ranging from 5.69 to 37.8. Of these 8 samples, HCV RNA was detected in only one, which had the highest anti-HCV titre of 37.8 (Table I). Sequencing confirmed that the RT-PCR product is HCV-

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