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HIV viral suppression in Oman: Encouraging progress toward achieving the United Nations 'third 90'☆

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ABSTRACT

Objective: To assess the impact of capacity-building interventions introduced by the Oman National AIDS Programme on the quality of HIV care in the country.
Methods: HIV viral load (VL) suppression and loss to follow-up (LTFU) rates were calculated for the period before (in December 2015; $n = 1098$) and after (in June 2017; $n = 1185$) the introduction of the interventions: training, support, and care pathway development. Three HIV VL cuts-offs at last measurement in the year of interest were used to define VL suppression.
Results: In the intention-to-treat (ITT) analysis, rates of VL <200 copies/ml and <1000 copies/ml increased from 51.9% in 2015 to 65.5% in 2017 (relative risk (RR) 1.26, 95% confidence interval (CI) 1.17–1.36) and from 58.1% in 2015 to 70.9% in 2017 (RR 1.22, 95% CI 1.14–1.30), respectively; $p < 0.0001$ for both. Similarly, in the on-treatment analysis, rates of VL <200 copies/ml and <1000 copies/ml increased from 64.2% in 2015 to 76.9% in 2017 (RR 1.20, 95% CI 1.12–1.28) and from 71.9% in 2015 to 83.2% in 2017 (RR 1.16, 95% CI 1.10–1.22), respectively. Fewer patients were LTFU in 2017 than in 2015 (14.7% (157/1061) vs. 19.2% (188/981); RR 0.77, 95% CI 0.64–0.94).
Conclusions: Achieving the UNAIDS target of 90% of HIV patients on treatment having VL suppression by 2020 is feasible in Oman.

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Introduction

The advent of highly active antiretroviral therapy (HAART) has revolutionized the prognosis of HIV infection. The morbidity and mortality of this infection have been reduced dramatically (Jensen-Fangel et al., 2004); HIV-infected patients are now expected to have a near-normal life expectancy (Gueler et al., 2017). In addition, antiretroviral therapy (ART) can prevent the onward transmission of HIV in serodiscordant couples (Cohen et al., 2011; Jia et al., 2013). At the population level, the widespread use of ART and subsequent reduction in community HIV viral load (VL) has been associated with lower HIV incidence (Das et al., 2010; Montaner et al., 2010; Tanser et al., 2013). In order to realize these individual and public benefits of HIV treatment, people living with HIV/AIDS (PLWHA) should attain VL suppression—the ultimate goal of the HIV care continuum. To achieve VL suppression, PLWHA should know their HIV diagnosis, be linked to care, start ART, be retained in care, and be maintained on ART.

Various international HIV guidelines have set different cut-offs for HIV VL suppression. The World Health Organization (WHO) defines VL suppression as <1000 copies/ml (The Joint United Nations Programme on HIV/AIDS, 2014). On the other hand, European and American HIV guidelines define VL suppression as undetectable, i.e., below the lower limit of assay detection, and <200 copies/ml, respectively (Churchill et al., 2015; European AIDS Clinical Society, 2017; US Department of Health and Human Services, 2017). Furthermore, in 2015, the Joint United Nations Programme on HIV/AIDS (UNAIDS) set an ambitious global 90–90–90 target, with its goal being that 90% of PLWHA know their HIV diagnosis, 90% of diagnosed people take ART, and 90% of those on treatment achieve VL suppression (HIV VL <1000 copies/ml) by the year 2020 (The Joint United Nations Programme on HIV/AIDS, 2014).

Evidence-based interventions that improve retention in care and VL suppression are lacking. Starting in January 2016, the National AIDS Programme (NAP) in the Sultanate of Oman introduced a package of interventions aimed at building the capacity of HIV providers and improving the quality of service delivery throughout the country. The interventions included training of healthcare workers caring for HIV patients, developing care pathways, and advocating case conferences for clinical decisions in cases of treatment failure. This study reports the rates of loss to follow-up (LTFU) and VL suppression using three VL cut-offs, for the periods before and after the introduction of the NAP initiatives.

Methods

Setting

Oman is situated in the southeastern corner of the Arabian Peninsula, bordering the Kingdom of Saudi Arabia, the United Arab Emirates, and Yemen. The total population of Oman is 4 653 767; of these, 2 552 307 (54.80%) are Omanis and 2 101 307 (45.20%) are non-Omanis (National Center for Statistics and Information, 2018). The HIV epidemic in Oman, as per the WHO classification, is a low-prevalence epidemic. The first case of HIV in Oman was detected in 1984. At the end of 2017, 2917 HIV/AIDS cases were reported among Omanis, 1606 of whom were alive.

Formed in 1996, the NAP is now part of the Directorate General for Disease Surveillance and Control at the Ministry of Health (MOH). There are 14 treatment centers in Oman that are spread across the country and offer ART free of charge. Patients have access to all available antiretrovirals, including named patient programs. All treatment centers have access to CD4 testing, with one central public health laboratory located in Muscat that is responsible for HIV VL processing. Genotype resistance testing for the detection of both transmitted and acquired resistance was introduced at the central public health laboratory in August 2016. Prior to that, samples for genotype resistance testing (primarily for acquired resistance) were sent abroad. Oman adopted treatment for all, regardless of CD4 cell count (HIV management in Oman, a guide for healthcare workers, 2015), as soon as the Strategic Timing of Antiretroviral Treatment (START) trial data were published showing that individuals benefit from starting ART sooner, even at a CD4 cell count above 500 cells/mm^3 (Lundgren et al., 2001).

Study population

Patients were identified from the NAP database. Patients who were reported to NAP as having started HAART and were not known to have died were selected. Patients who had never been linked to care or who defaulted care prior to ART initiation were excluded.

Definitions of the outcomes of interest

Three VL cut-offs were used (<20, <200, and 1000 copies/ml) at last measurement by December 31, 2015 and June 30, 2017 to define VL suppression before and after the interventions, respectively. LTFU was defined as not having a single VL measurement in the preceding 12 months (i.e., during the period from December 2014 to December 2015, or June 2016 to June 2017) and not known to have transferred care or died.

Interventions

The interventions implemented by NAP between the times when the samples were taken and studied, December 2015 and June 2017, are outlined below.

A 2-day case-based interactive clinical training session for clinical staff was set up in all HIV treatment centers. Fifteen cases covering important aspects of HIV care, from linkage to care to VL suppression, were discussed. This was followed up by 6-week clinical placements for non-consultant doctors, nurses, and counselors at a tertiary HIV center in Muscat. The training was hands-on and tailored as per the needs of the trainees. Members of staff working in clinics with suboptimal VL suppression were prioritized.

Care pathways were developed for newly diagnosed patients, ART initiation, ART switch, VL result check, and referral to tertiary centers in cases of treatment failure. A counselor would see newly diagnosed patients, for their first contact with HIV services, on a different day from the HIV clinic day. In addition, patients would only be started on ART at their first visit to the HIV treatment center if they showed commitment, motivation, and understanding of the rationale of treatment. Otherwise, patients would be counseled thoroughly about their diagnosis and prepared well for ART initiation over 2–4 weeks prior to commencing therapy. Patients would be seen at 2, 4, 8, and 12 weeks following ART initiation for adherence support, ART tolerance check, and laboratory monitoring. Moreover, any HIV VL requested in the clinic would be checked and acted upon as soon the laboratory released the result. Patients with treatment failure (VL >200 copies/ml, on two separate readings, 6 months after ART initiation/change) would be referred to a tertiary center; a detailed referral form would be completed with all clinical information needed by the receiving clinic to make a sound clinical judgment.

A list of patients failing therapy (VL >200 copies/ml) was sent by NAP to the respective HIV clinic for review and actions, such as adherence support and/or referral to larger clinics for further management.