

Original Article

Quick diagnostic approach for HIV/STDs among migrants: results from a monocentric Italian cohort

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Abstract

Introduction: Migration has a direct influence on sexual health. Differences both in sexual networks and the risk of sexually transmitted diseases (STDs) between racial or ethnic minorities and the native population have been described in the literature.

Methodology: We collected data on medical history, physical examination, and human immunodeficiency virus (HIV)/STDs tests. Screenings were proposed basing on Centers for Disease Control (CDC) 2018 guidelines on STDs. Patients underwent peer-to-peer counselling before screening.

Results: We included data of 391 patients (both outpatients and migrants living in facility centers). The median age was 30 (range 24-38) years, and the majority were male (198/391; 50.6%). Among them, 389 (99.4%) were counselled, and 371 (94.8%) accepted the screening. We found 155 (41.7%) HBsAg/Anti-HBc positive tests, 4 (1%) HIV positive screenings, 1 (0.2%) hepatitis C virus (HCV) infection, 47 (12%) genital/perianal warts, 29 (2.3%) cases of syphilis, and 13 (3.3%) molluscum contagiosum.

Conclusions: Migrants have high-risk sexual behavior. Despite this, they may have a low perception of risk and healthcare needs. An approach based on quick tests was demonstrated to be useful in increasing the screening acceptance. However, the retainment in care was low, as in previous studies. Access to HIV/STDs screening and treatment should be implemented. The development of specific retainment in care pathways is still needed to reduce the lack of follow-up.

Key words: HIV; STDs; migrants; healthcare-services.

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Introduction

Sexually transmitted diseases (STDs) are still a major health problem with high incidence around the world. They have a strong influence on morbidity and mortality worldwide, compromising the quality of life, and sexual and reproductive health [1]. STDs also increase the risk of human immunodeficiency virus (HIV) sexual transmission.

The prevalence and incidence of STDs are significantly higher in underserved populations. In fact, social segregation, migration, and healthcare provision and use are disproportionally lower, with epidemiological differences between populations' subgroups, principally for healthcare disparities. This may also impact on other communities. Moreover, ethnicity represents a substantial element for higher STDs prevalence [2].

Published studies showed how HIV/STDs among racial and ethnic minorities are up to 18 times higher than in Caucasian people, with an increased risk

regardless of the behavior [3,4]. This substantial difference has also been highlighted by the Centers for Disease Control (CDC) surveillance on STDs [5]. Moreover, STDs such as syphilis increase the risk of HIV infection by three-fold or more [2].

The continuous migratory flow from Africa to Italy in recent years, requires a progressive increase in attention from healthcare providers. In fact, previous literature highlighted high levels of difficulties in developing strategies to test, treat, and retain on care migrants with HIV/STDs.

According to literature, the use of quick tests for screening methods (e.g., saliva test, finger sticks) may allow a rapid diagnostic approach for underserved populations without delays [6,7]. For this reason, their use may represent an advantage in hard settings (e.g., migrant facilities; migration outpatients' services, etc.).

We report our experience with the use of rapid diagnostic tests among migrants in Sassari, Italy.

Methodology

Study set up

We conducted a retrospective study including data of both outpatients and migrants living in the facility centers. Medical history and data on clinical examination were collected to identify the prevalence of individuals with high-risk sexual behavior. Only the patients who underwent screening with a step-by-step model using quick tests were included [8]. Screening was based on the CDC guidelines on STDs [9], anamnesis and physical examination. The tests were executed with quick tests (capillary blood tests). In case of positivity, blood samples for hepatitis C and B viruses were collected immediately (HCV-RNA, HBV serology and HBV-DNA). Syphilis had to be confirmed with venereal disease research laboratory (VDRL) and *Treponema pallidum* haemoagglutination assay (TPHA) tests before proposing the treatment. Physicians oversaw blood samples transport. Genital/anal lesions were evaluated with a dermatovenerologist. The step-by-step model approach is shown in Figure 1.

Statistical analysis

Data distribution was evaluated with the Kolmogorov-Smirnov test and was elaborated as numbers on total (percentages), and median (IQR) when appropriate.

Multivariate analysis was conducted using logistic regression. The significance level was defined as $p < 0.05$.

Ethical issues

We conducted this survey in accordance with the Helsinki Declaration. All patients’ data were collected from routine clinical practice, fully anonymized, and retrospectively analyzed. For this type of study, neither formal consent nor ethical committee approval are

required, according to current the national law from Italian Medicines Agency and according to the Italian Data Protection Authority. However, all patients signed informed consent [10].

Results

Population

Overall, 391 people were evaluated. Among them, 198 (50.6%) were male, and the most frequent nationality was Nigerian (163; 41.7%). Most participants did not declare sexual behavior (220; 56.5%); and 131 (33.5%) were heterosexuals. In two cases (0.6%) the counselling led to refusal to being evaluated. Out of the 389 counselled patients, 371 (94.8%) people agreed to screenings. Overall, 60 (15.4%) patients showed genital/perianal lesions upon physical evaluation. Socio-demographics and clinical features of patients included in our study are presented in Table 1.

Genital/perianal lesions

Out of the 60 patients with genital/anal lesions, 47 (78.3%) had genital/perianal warts, 13 (21.6%) had molluscum contagiosum, and 2 (3.3%) had primary syphilis. Among them, 48 (80%) agreed to undergo screening tests.

Syphilis

Out of the 371 people who agreed to the screenings, 29 (7.8%) tested positive to syphilis. Excluding the two patients with primary lesions, the remaining patients (27/371; 7.2%) had latent disease.

Figure 1. Flow-chart showing the step-by-step diagnostic approach among migrants included in our study.

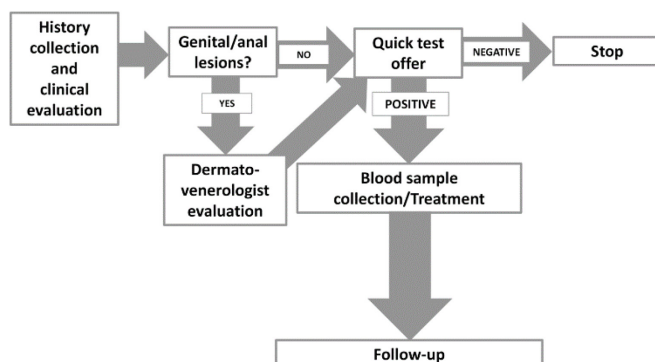


Table 1. Socio-demographics of 391 patients evaluated in our study.

Variable	Result (n = 391)
Male gender, n (%)	198 (50.6)
Age, median (IQR)	29 (23-37)
Nationality, n (%)	
Federal Republic of Nigeria	163 (41.7)
Federal Republic of Somalia	16 (4.1)
Republic of Ghana	3 (0.7)
Republic of Guinea	38 (9.7)
Republic of Senegal	126 (32.2)
Ivory Coast	14 (3.6)
Republic of Sierra Leone	6
Counselled, n (%)	389 (99.5)
Genital lesions, n (%)	60 (15.4)
Screening accepted, n (%)	371 (94.8)
Sexual behavior, n (%)	
Not declared	221 (56.5)
Etero	131 (33.5)
MSM	12 (3.1)
Sex worker	27 (6.9)

MSM: men who have sex with men.

Blood-borne viruses (BBV)

Regarding BBV, 1 (0.2%) patient had chronic HCV, 4 patients (1.1%) tested positive for HIV, and 156 (42%) for HBV (HBsAg or Occult B Infection,OBI). The diagnoses of patients who agreed to the screening are presented in Table 2.

Demographic influence on screening acceptance

When performing logistic regression on determinants of participants’ screening acceptance, a surprising result was observed: participants with genital/anal lesions were less likely to agree to screening. The logistic regression analysis aimed at evaluating the association between demographics and HIV/STDs screening acceptance is presented in Table 3.

Follow-up visits attendance

Overall, only 59 patients (15.1%) attended at least one follow-up visit. However, all patients who tested positive to HIV (4/4; 100%) and HCV (1/1; 100%) attended follow-up treatment. The cascade of care among patients included in our study is presented in Figure 2.

Discussion

HIV/STDs are among the most important healthcare problems worldwide, and disparities in field among underserved populations, such as migrants, have been widely discussed in the available literature [2,11-13].

Interestingly, we found higher HIV/STDs screening acceptance than in our previous studies on similar populations [12,13]. Obviously, the use of rapid diagnostic test was a good tool in this case. As per previous literature, quick tests may ensure higher screening acceptance rates, particularly when considering vulnerable populations [8,14-16]. Despite this, it was very difficult to assess the sexual behavior. In fact, most patients refused to declare their sexual behavior.

In the case of diagnoses, HBV (including both chronic infection and OBI) was the most frequent BBV we found in the analyzed population (~42%). This confirms our previous data [12,13]. Furthermore,

Table 2. STDs/HIV among 371 patients who accepted the screening in our study.

Variable	Result (n= 371)
Syphilis, n (%)	29 (7.8%)
OBI, n (%)	109 (29.4%)
HBsAg positive, n (%)	46 (12.4%)
HIV, n (%)	4 (1.1%)
HCV, n (%)	1 (0.2%)

STD: sexually transmitted disease; HIV: human immunodeficiency virus; OBI: occult B infection; HCV: hepatitis C virus.

HBsAg positivity rates were concordant with the available international literature [17,18]. HBV among migrants is often birth related. As a consequence, liver cirrhosis and hepatocellular carcinoma may occur even in young patients, with a substantial impact on their life expectancy [19]. In fact, high performance diagnostic tests and effective drugs with low side effects are available and should be offered to prevent advanced disease [19-21].

HCV infection was a rare diagnosis (0.3%), and this is in line with our previous data [12,13], even if slightly lower than recent national literature which reported the HCV seroprevalence among migrants ranging from 1.7-2.2% [22,23].

HIV screening acceptance was very high in this case. This was unlike our previous results on similar populations and was unexpected. We speculate about

Figure 2. Cascade of care among 391 migrants included in our study.

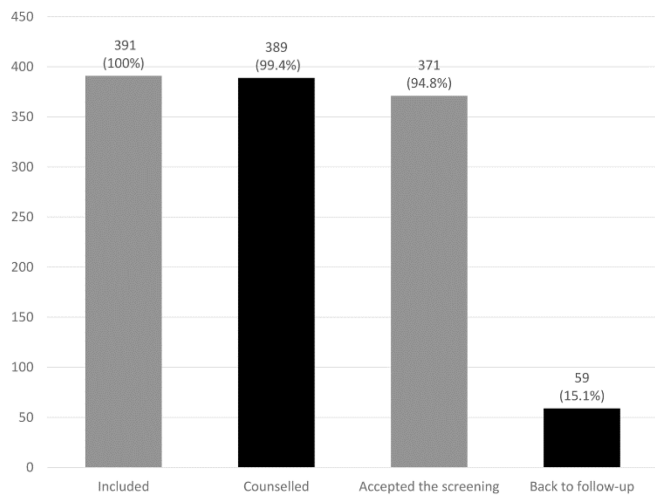


Table 3. Logistic regression analysis aiming to evaluate the association between demographics and STDs/HIV screening acceptance.

Variable	Odds ratio	95% CI	p value
Nigerian nationality	47009.9233	(0.0000)	0.9981
Male gender	2.8202	(1.0056, 7.9096)	0.0488
Age > 25	0.9942	(0.2472, 3.9981)	0.9934
Genital/anal lesions	0.1039	(0.0363, 0.2970)	< 0.0001

STD: sexually transmitted disease; HIV: human immunodeficiency virus.

the possible role of quick test in the decision process, given the possibility of an immediate execution and a rapid result. Regarding the prevalence, only 4 patients tested positive (1%). Even in this case, our results are in accordance with national literature, where a prevalence between 0.6% to 0.9% was observed [22, 23].

Individuals with genital/anal lesions were less likely to accept screening. Furthermore, the attendance to follow-up was very low. This clearly reflects the difficulty in providing care to some hard-to-reach populations. Better awareness and educational approaches are still needed. However, all patients who tested positive to HIV came back to the physician, and this represents a positive result.

Limitations of the study

Our study had some limitations. Firstly, this is a monocentric study and may not reflect the situation in the entire country. Furthermore, data were collected retrospectively, and this may reduce the strength of the study. Our data should be confirmed with bigger, prospective studies, with an ad hoc sample size calculation.

Conclusions

Infectious diseases control and prevention are fundamental among migrants. Tailored approaches with quick tests may represent a key strategy to obtain a good adherence to screening programs.

However, tailored approaches for the retainment in care are still needed, given the low rates of attendance to follow-up visits.

References

- World Health Organization (2017) Sexually transmitted infections: implementing the Global STI Strategy. Geneva - Switzerland 2017. Available: <https://www.who.int/publications/i/item/sexually-transmitted-infections-implementing-the-global-sti-strategy>. Accessed: 6 March 2023.
- Fiore V, Latte G, Madeddu G, Galleri G, Rocchitta G, Nuvoli S, Calvisi D, Bagella P, Manetti R, Serra PA, Spanu A, Babudieri S (2017) Underserved populations and bacterial and protozoal sexually transmitted infections: a lost health-care opportunity. *Eur Rev Med Pharmacol Sci* 21: 3935-3943.
- Hallfors DD, Iritani BJ, Miller WC, Bauer DJ (2007) Sexual and drug behavior patterns and HIV and STD racial disparities: the need for new directions. *Am J Public Health* 97: 125-132. doi: 10.2105/AJPH.2005.075747.
- Newman LM, Berman SM (2008) Epidemiology of STD disparities in African American communities. *Sex Transm Dis* 35: S4-S12. doi: 10.1097/OLQ.0b013e31818eb90e.
- Centers for Disease Control and Prevention (2018) Sexually transmitted disease surveillance 2018. Available: <https://www.cdc.gov/std/stats18/STDSurveillance2018-full-report.pdf>. Accessed: 6 March 2023.
- Beckwith CG, Kurth AE, Bazerman L, Solomon L, Patry E, Rich JD, Kuo I (2015) Survey of US correctional institutions for routine HCV testing. *Am J Public Health* 105: 68-71. doi: 10.2105/AJPH.2014.302071.
- Candfield S, Samuel MI, Ritchie D, McDonald C, Brady M, Taylor C (2017) Use and acceptability of salivary hepatitis C virus testing in an English young offender institution. *Int J STD AIDS* 28: 1234-1238. doi: 10.1177/0956462417696214.
- Fiore V, De Matteis G, Ranieri R, Saderi L, Pontali E, Muredda A, Ialungo AM, Caruso R, Madeddu G, Sotgiu G, Babudieri S (2021) HCV testing and treatment initiation in an Italian prison setting: a step-by-step model to micro-eliminate hepatitis C. *Int J Drug Policy* 90: 103055. doi: 10.1016/j.drugpo.2020.103055.
- Workowski KA, Bolan GA, Centers for Disease Control and Prevention (2015) Sexually transmitted diseases treatment guidelines. *MMWR Recomm Rep* 64: 1-137.
- GDPR (2012) General authorisation to process personal data for scientific research purposes - 1 March 2012 [1884019]. Available: <https://www.garanteprivacy.it/home/docweb/-/docweb-display/docweb/1884019>. Accessed: 1 April 2023.
- Donisi A, Colpani A, Zauli B, De Vito A, Fiore V, Babudieri S, Madeddu G (2023) Sexually transmitted infections prevalence and cascade of care among undocumented sex workers: a twenty-year-long experience. *Life* 13: 606. doi: 10.3390/life13030606.
- Fiore V, De Vito A, Geremia N, Martineková P, Princic E, Babudieri S, Madeddu G (2021) High-risk sexual behavior and HIV/STDs cascade of care in migrants: results from an Italian dedicated outpatient clinic. *J Infect Dev Ctries* 15: 297-300. doi: 10.3855/jidc.13346.
- Fiore V, De Vito A, Martineková P, Princic E, Geremia N, Madeddu G, Babudieri S (2021) Infectious diseases screening approach among refugees: results from a single-center study. *J Infect Dev Ctries* 15: 847-852. doi: 10.3855/jidc.15030.
- Fiore V, De Vito A, Colpani A, Manca V, Maida I, Madeddu G, Babudieri S (2022) Viral hepatitis C new microelimination pathways objective: psychiatric communities HCV free. *Life* 12: 1873. doi: 10.3390/life12111873.
- Fiore V, De Matteis G, Pontali E, De Vito A, Panese S, Geremia N, Maida I, Artioli S, Starnini G, Madeddu G, Babudieri S (2022) Quick diagnosis, staging, and treatment of HCV infection among people living in prison: opinion expert panel. *Front Public Health* 10: 926414. doi: 10.3389/fpubh.2022.926414.
- Fiore V, Rastrelli E, Madeddu G, Ranieri R, De Vito A, Giuliani R, Di Mizio G, Bolcato M, De Matteis G, Ialungo AM, Dell'Isola S, Starnini G, Babudieri S (2022) HCV spread among female incarcerated population and treatment pathways to viral elimination in Italian prison settings: clinical perspectives and medico legal aspects. *BMC Infect Dis* 22: 601. doi: 10.1186/s12879-022-07565-2.
- Olayinka AT, Oyemakinde A, Balogun MS, Ajudua A, Nguku P, Aderinola M, Egwuenu-Oladejo A, Ajisegiri SW, Sha'aibu S, Musa BO, Gidado S, Nasidi A (2016) Seroprevalence of hepatitis B infection in Nigeria: a national survey. *Am J Trop Med Hyg* 95: 902-907. doi: 10.4269/ajtmh.15-0874.
- Chernet A, Utzinger J, Sydow V, Probst-Hensch N, Paris DH, Labhardt ND, Neumayr A (2018) Prevalence rates of six selected infectious diseases among African migrants and refugees: a systematic review and meta-analysis. *Eur J Clin*

- Microbiol Infect Dis 37: 605-619. doi: 10.1007/s10096-017-3126-1.
19. Behzadi P, Ranjbar R, Alavian SM (2014). Nucleic Acid-based approaches for detection of viral hepatitis. *Jundishapur J Microbiol* 8: e17449. doi: 10.5812/jjm.17449.
 20. Behzadi P, Behzadi E, Alavian SM (2017). DNA microarray technology in HBV genotyping. *Minerva Med* 108: 473-476. doi: 10.23736/S0026-4806.17.05059-5.
 21. Madeddu G, Fiore V, Melis M, Ortu S, Mannu F, Muredda AA, Garrucciu G, Bandiera F, Zaru S, Bagella P, Calvisi DF, Babudieri S (2020) Mitochondrial toxicity and body shape changes during nucleos(t)ide analogues administration in patients with chronic hepatitis B. *Sci Rep* 10: 2014. doi: 10.1038/s41598-020-58837-3.
 22. Prestileo T, Di Marco V, Dino O, Sanfilippo A, Tutone M, Milesi M, Di Marco L, Picchio CA, Craxì A, Lazarus JV; Immigrant Take Care Advocacy (ITaCA) Team (2022) Effectiveness of a screening program for HBV, HCV, and HIV infections in African migrants to Sicily. *Dig Liver Dis* 54: 800-804. doi: 10.1016/j.dld.2021.08.024.
 23. Colucci G, Uceda Renteria S, Lunghi G, Ceriotti F, Sguazzini E, Spalenza S, Regazzo C, Lampertico P, Colombo M (2022) Italian migrants' study: an HCV and HBV micro-elimination pilot project. *Clin Res Hepatol Gastroenterol* 46: 101852. doi: 10.1016/j.clinre.2021.101852.

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