

EARLY DIAGNOSIS OF HIV INFECTION IN HEALTH-CARE

Vol.1 Núm. 4 2019

ISSN-L: 2695-2785

DOI: -

EARLY DIAGNOSIS OF HIV INFECTION IN HEALTH-CARE SETTINGS

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Abstract: The late diagnosis of HIV infection is a major obstacle to meeting the goals set out with the 90-90-90 Strategy, hence the importance of promoting early diagnosis of HIV using HIV diagnostic testing. This test may be a screening test or a confirmatory test. The basic principles of testing are three: counselling, informed consent, and confidentiality. The recommended populations for conducting this test are, on the one hand, individuals with suggestive symptoms (both with conditions indicating HIV infection and with AIDS-defining illnesses) and, on the other hand, individuals without suggestive symptoms (both routine tests as well as targeted and mandatory tests).

Keywords: early diagnosis, HIV testing.

DIAGNÓSTICO PRECOZ DEL VIH EN EL ÁMBITO SANITARIO

Resumen. El diagnóstico tardío de la infección por VIH es un problema fundamental para cumplir la estrategia 90-90-90, de ahí la importancia de promover el diagnóstico precoz del VIH con la realización de la prueba diagnóstica de VIH. Esta prueba puede ser de cribado o de confirmación. Los principios básicos de la prueba son tres: consejo asistido, consentimiento informado y confidencialidad. Las recomendaciones de realización de la prueba son, por un lado, en personas con sintomatología sugerente (tanto con enfermedades indicadoras de infección por VIH como con enfermedades definitorias de sida) y, por otro, en personas sin sintomatología sugerente (tanto oferta rutinaria, como oferta dirigida y realización obligatoria).

Palabras clave: diagnóstico precoz, prueba de VIH.

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DIAGNÓSTICO PRECOCE DO VIH NO ÂMBITO DA SAÚDE

Resumo: O diagnóstico tardio da infeção pelo VIH é um problema fundamental para cumprir a estratégia 90-90-90, daí a importância de promover o diagnóstico precoce do VIH com a realização do teste de diagnóstico do VIH. Este teste pode ser de triagem ou de confirmação. São três os princípios básicos do teste: conselho assistido, consentimento informado e confidencialidade. As recomendações para a realização do teste são, por um lado, em pessoas com sintomatologia sugestiva (tanto com doenças indicadoras de infeção pelo VIH, como doenças definidoras de SIDA) e, por outro lado, em pessoas sem sintomatologia sugestiva (tanto proposta de rotina, como proposta direcionada e realização obrigatória).

Palavras-chave: diagnóstico precoce, teste de VIH.

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INTRODUCTION

Late diagnosis is one of the main obstacles to fulfilling the UNAIDS 90-90-90 Strategy. Late diagnosis may be defined as the diagnosis of individuals who have a CD4 cell count below 350 cells/ μ L at the time of diagnosis or who have an AIDS-defining illness (regardless of the CD4 cell count).

Delayed diagnosis of HIV has important negative consequences both individually and collectively: at the individual level, delayed diagnosis increases morbidity and mortality, and at the collective level, it increases the transmission of the epidemic throughout the population and increases the costs of the social and healthcare system.

In 2017, diagnostic delays in the European Union accounted for 49% of cases (CD4 > 350 cells/ μ l), which included 28% of cases with advanced disease (CD4 > 200 cells/ μ l). In Spain, diagnostic delays accounted for 48%, whereas in Portugal they accounted for 51% (European Centre for Disease Prevention and Control, 2018). Therefore, it is essential to promote early HIV diagnosis using HIV testing (World Health Organization, 2010).

TYPES OF HIV TESTS

The diagnosis of HIV infection is based on a two-step strategy. First, a screening analysis is performed, which is followed by a confirmatory analysis (Ministerio de Sanidad Servicios Sociales e Igualdad y Plan Nacional sobre Sida, 2014).

1. Screening techniques

In healthcare settings, the technique of choice is the fourth-generation Enzyme-Linked ImmunoSorbent Assay (ELISA), which involves the simultaneous determination of the presence of anti-HIV-1 and anti-HIV-2 antibodies, and the HIV-1 p24 antigen. This technique has an advantage compared to the third generation, which is that it reduces the window period between the acquisition of the infection and the detection of a HIV-positive result to have a duration of only 2 to 4 weeks

There are also rapid tests, usually conducted in community settings, which will be discussed in the next article.

Both techniques are highly sensitive. Therefore, in the case of a negative result, infection may be excluded, except in the case of a recent infection (6 weeks for fourth-generation ELISAs and 3 months for rapid tests). If results are positive, further confirmation is required (Ministerio de Sanidad Servicios Sociales e Igualdad y Plan Nacional sobre Sida, 2014).

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2. Confirmatory techniques

The most frequently used techniques are the Western Blot (WB) and the third-generation Recombinant ImmunoBlot Assay (RIBA). They have a high specificity and facilitate the detection of specific antibodies against the different proteins of the virus.

Fourth-generation tests, which include direct detection of virus components (p24 antigen or viral genome), are recommended for children under 18 months of age (Panel de expertos de Gesida y Plan Nacional sobre el Sida, 2019) or for adults with inconclusive results.

BASIC PRINCIPLES AND SCOPE OF THE TEST

The basic principles of HIV testing (“the three Cs”) (European Centre for Disease Prevention and Control (ECDC), 2016) are the following:

- **Counselling:** the individual being tested will receive brief pre-test information. In addition, individuals who test positive will be guaranteed post-test counselling, referral to the appropriate care services, and access to the type of ART required.
- **Informed Consent:** the informed consent of the individual being tested is required (at least verbally) and must be voluntary (except for the cases listed in section 2.3).
- **Confidentiality** must be maintained for the test results and for the fact of having requested it. The test must also be accessible to the entire population and be available free of charge.

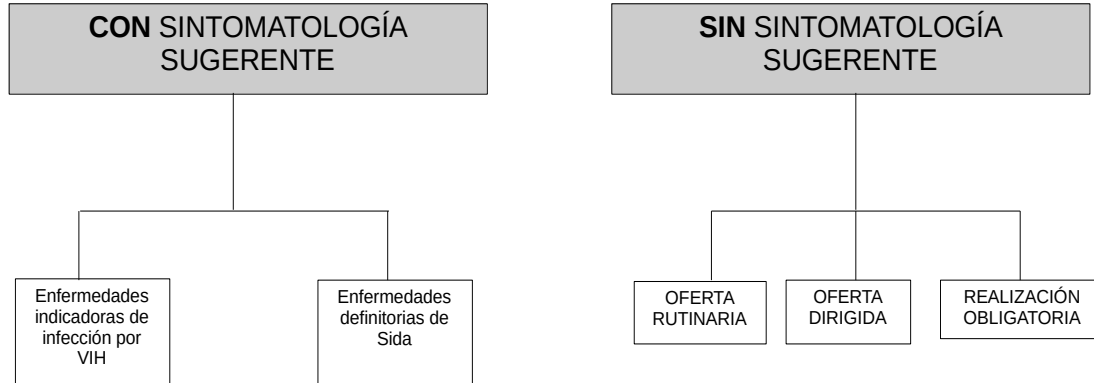
Regarding the scope of application, it is recommended that the test be performed in all healthcare centres, both in primary care and in specialised care centres, as well as in sexually transmitted infection (STI) clinics; with an emphasis on specialised services with a lesser tradition in offering this test, such as dentistry, gynaecology, haematology, gastroenterology, dermatology, pulmonology, and neurology, as well as in the emergency department.

RECOMMENDATIONS FOR TESTING

There are recommendations for testing individuals with clinical suspicion of HIV infection, as well as asymptomatic individuals, whether or not they report being involved in HIV risk practices. When there is no clinical suspicion, a distinction is made between routine, targeted, and mandatory offers for testing. (Figure 1. Algorithm of HIV test recommendations). (Table 1. Figure 1. Algorithm of HIV test recommendations translation)

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Figure 1. Algorithm of HIV test recommendations



Source: Adapted from Spanish Ministry of Health, Social Services and Equality (2014). *Guía de Recomendaciones para el diagnóstico Precoz del VIH en el ámbito sanitario.*

Table 1. Figure 1. Algorithm of HIV test recommendations translation

Spanish	English
CON SINTOMATOLOGÍA SUGERENTE	WITH SYMPTOMS SUGGESTIVE OF HIV INFECTION
SIN SINTOMATOLOGÍA SUGERENTE	WITH NO SYMPTOMS SUGGESTIVE OF HIV INFECTION
Enfermedades indicadoras de infección por VIH	Illnesses indicating HIV infection
Enfermedades definitorias de Sida	AIDS-defining illnesses
OFERTA RUTINARIA	ROUTINE OFFER
OFERTA DIRIGIDA	TARGETED OFFER
REALIZACIÓN OBLIGATORIA	MANDATORY OFFER

1. Individuals with clinical symptoms consistent with HIV infection or AIDS

HIV testing is required for individuals with any of the conditions listed in (Table 2. AIDS-defining illnesses) (Table 3. Conditions indicating HIV infection associated with an undiagnosed HIV prevalence of > 0.1 %) (Table 4. Other conditions possibly associated with an undiagnosed HIV prevalence of > 0.1%) (Table 5. Conditions in which the failure to identify the presence of HIV infection may have significant negative consequences for the clinical management of the individual despite the fact that the estimated HIV prevalence is probably less than 0.1%)

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Table 2. AIDS-defining illnesses

AIDS-defining illnesses
1. Cervical cancer (invasive)
2. Oesophageal candidiasis
3. Pulmonary, tracheal, or bronchial candidiasis
4. Coccidioidomycosis (disseminated or extrapulmonary)
5. Cryptococcosis (extrapulmonary)
6. Chronic intestinal cryptosporidiosis (> 1 month duration)
7. HIV-associated encephalopathy
8. Cytomegalovirus disease not affecting the liver, spleen, and nodules
9. Herpes simplex: chronic ulcers (>1 month duration); or bronchitis, pneumonitis, or esophagitis
10. Recurrent salmonella septicaemia
11. Histoplasmosis (disseminated or extrapulmonary)
12. Isosporiasis (chronic intestinal > 1 month duration)
13. Progressive multifocal leukoencephalopathy
14. Immunoblastic lymphoma
15. Primary cerebral lymphoma
16. Burkitt lymphoma
17. Mycobacterium avium complex or Mycobacterium kansasii (disseminated or extrapulmonary)
18. Mycobacterium, other species or unidentified species (disseminated or extrapulmonary)
19. Pneumonia (recurrent)
20. Pneumocystis jirovecii pneumonia
21. Cytomegalovirus retinitis (with loss of vision)
22. Kaposi's sarcoma
23. HIV wasting syndrome
24. Cerebral toxoplasmosis
25. Mycobacterium tuberculosis (extrapulmonary or pulmonary)
26. Visceral leishmaniasis (kala-azar)*

** In Spain, although this is not considered an AIDS-defining illness, visceral leishmaniasis (kala-azar) has been added to this list of conditions, especially when it presents atypical manifestations or is recurrent.*

Source: Spanish Ministry of Health, Social Services and Equality (2014). Guía de Recomendaciones para el diagnóstico Precoz del VIH en el ámbito sanitario.

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Table 3. Conditions indicating HIV infection associated with an undiagnosed HIV prevalence of > 0.1 %

Conditions indicating HIV infection associated with an undiagnosed HIV prevalence of > 0.1 %
1. Sexually transmitted infections
2. Malignant lymphoma
3. Anal cancer/dysplasia
4. Cervical dysplasia
5. Herpes zoster
6. Hepatitis B or C (acute or chronic)
7. Mononucleosis syndrome
8. Thrombocytopenia or idiopathic leukocytopenia lasting more than 4 weeks
9. Seborrheic dermatitis/exanthema
10. Invasive pneumococcal disease
11. Fever with no apparent cause
12. Candidaemia
13. Visceral leishmaniasis

Source: Spanish Ministry of Health, Social Services and Equality (2014). *Guía de Recomendaciones para el diagnóstico Precoz del VIH en el ámbito sanitario.*

Table 4. Other conditions possibly associated with an undiagnosed HIV prevalence of > 0.1%

Other conditions possibly associated with an undiagnosed HIV prevalence of > 0.1%
1. Primary lung cancer
2. Lymphocytic meningitis
3. Oral hairy leukoplakia
4. Severe or atypical psoriasis
5. Guillain-Barré syndrome
6. Mononeuritis
7. Subcortical dementia
8. Multiple sclerosis-type disease
9. Peripheral neuropathy
10. Unexplained weight loss
11. Idiopathic lymphadenopathy
12. Idiopathic oral candidiasis
13. Chronic idiopathic diarrhoea
14. Idiopathic chronic kidney failure
15. Idiopathic oral candidiasis
16. Community-acquired pneumonia
17. Candidiasis

Source: Spanish Ministry of Health, Social Services and Equality (2014). *Guía de Recomendaciones para el diagnóstico Precoz del VIH en el ámbito sanitario.*

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Table 5. Conditions in which the failure to identify the presence of HIV infection may have significant negative consequences for the clinical management of the individual despite the fact that the estimated HIV prevalence is probably less than 0.1%

Conditions in which the failure to identify the presence of HIV infection may have significant negative consequences for the clinical management of the individual despite the fact that the estimated HIV prevalence is probably less than 0.1%

1. Conditions requiring aggressive immunosuppressive treatment:
 - Cancer
 - Transplants
 - Autoimmune conditions treated with immunosuppressive therapy
2. Primary space-occupying brain lesion
3. Idiopathic thrombocytopenic purpura

Source: Spanish Ministry of Health, Social Services and Equality (2014). Guía de Recomendaciones para el diagnóstico Precoz del VIH en el ámbito sanitario.

2. Individuals with no suspected HIV infection

In the case of individuals with no suspicion of infection, a distinction must be made between routine, targeted, and mandatory offers of HIV testing.

2.1 Routine offer of HIV testing

Routine offer of the test is a viable option considering its costs and its degree of acceptability, as long as the conditions detailed in Table 6 are met (Table 6. Conditions for routine offer of an HIV test):

Table 6. Conditions for routine offer of an HIV test

Conditions for routine offer of an HIV test	
General population (2 simultaneous criteria)	<ul style="list-style-type: none"> • Sexually active individuals aged between 20 and 59. • If a blood draw was indicated for any reason at a primary care centre.
Pregnant women, preferably in the first trimester of pregnancy	
Prisoners in penitentiaries	

Source: the authors.

2.2 Targeted offer of HIV testing

Testing is offered to all individuals who, due to their exposure to HIV or their background, need to rule out HIV infection (Table 7. Conditions for the targeted offer of HIV testing) (Table 8. Countries with an HIV prevalence of > 1% in adults aged between 15 and 49 years old according to the UNAIDS global report. Data from 2011)

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Table 7. Conditions for the targeted offer of HIV testing

Conditions for the targeted offer of HIV testing
All individuals who request it because they suspect a risk exposure
Sexual partners of HIV-infected individuals*
Current and former injection drug users and their sexual partners
Men who have sex with men (MSM) and their sexual partners (men and women)
Individuals who practice prostitution: women, men, and transgender people, their sexual partners, and their clients
Heterosexual individuals with more than one sexual partner and/or engaging in risky practices in the last 12 months
Individuals who wish to stop using condoms with their regular partners
Individuals who have been sexually assaulted
Individuals who have had an occupational or accidental exposure to HIV
Individuals from countries with a high-prevalence of HIV infection (> 1%) and their sexual partners

*They should be tested annually, as should any individual who is exposed to continued risk.

Source: the authors.

Table 8. Countries with an HIV prevalence of > 1% in adults aged between 15 and 49 years old according to the UNAIDS global report. Data from 2011

Countries with an HIV prevalence of > 1% in adults aged between 15 and 49 years old according to the UNAIDS global report. Data from 2011.	
Sub-Saharan Africa	Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo, Ethiopia, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Kenya, Lesotho, Malawi, Mali, Mauritania, Mozambique, Namibia, Nigeria, Rwanda, Sierra Leone, South Africa, South Sudan, Swaziland, Tanzania, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe
Central and Western Europe	Estonia
South and Southeast Asia	Thailand
Middle East and North Africa	Djibouti
Caribbean	Bahamas, Haiti, Jamaica, Trinidad and Tobago
Latin America	Belize, Guyana

Source: Spanish Ministry of Health, Social Services and Equality (2014). *Guía de Recomendaciones para el diagnóstico Precoz del VIH en el ámbito sanitario.*

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2.3 Mandatory HIV testing

In certain cases, HIV testing is legally mandated, as shown in (Table 9. Conditions for mandatory HIV testing):

Table 9. Conditions for mandatory HIV testing

Conditions for mandatory HIV testing
Blood donations
Organ transplant, graft, or implantation
Donor studies
Users of assisted reproductive techniques
Semen collection and reception

Source: the authors.

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RINSAD

The Journal of Childhood and Health (Revista Infancia y Salud - RINSAD), ISSN-L: 2695-2785, arises from the collaboration between the administrations of Portugal, Galicia, Castilla y León, Extremadura, and Andalusia, within the [Interreg Spain-Portugal RISCAR](#) project, and aims to disseminate scientific articles on children's health, providing researchers and professionals with a scientific base from which to learn about the latest advances in their respective fields.

RISCAR project is co-financed by the European Regional Development Fund (ERDF) through the Interreg Program V-A Spain-Portugal (POCTEP) 2014-2020, with a total budget of 649,699 €.

RINSAD is the result of the [Interreg Spain - Portugal RISCAR](#) project in collaboration with the [University of Cádiz](#) and the [Nursing and Physiotherapy Department of the University of Cádiz](#), Cádiz, Spain.

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