

Epidemiology of HIV Vertical Transmission

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Abstract

More than 30 years after the identification of the first cases of AIDS, numerous advancements have occurred involving the prevention, diagnosis and treatment of it. Despite all the advances and reduction of new cases in the world, Brazil maintains the persistent increase in the number of HIV infection and deaths. In this sense, the risk of perinatal infection also remains. Vertical transmission of HIV is a complex multifactorial process. The therapeutic and biomedical advances have not been sufficient to create a generation of children free of HIV. Thus, it is necessary to face other difficulties related to transmission of the virus, such as hunger, poverty, poor education, lack of access to health services and, in the existence of these, the quality of services provided. At the same time, so that the AIDS surveillance continue identifying the changes of HIV transmission patterns, it is necessary to improve the quality of information; build, understand and evaluate indicators; appropriately allocate resources, plan and monitor the impact of interventions.

Keywords: HIV, Vertical transmission of infectious disease, Prevention of disease, Antiretroviral drugs

Introduction

The term epidemiological surveillance date of the 1950 and originally meant the systematic and active observation of suspected or confirmed cases of communicable diseases and their contacts. In 1968 the epidemiological surveillance was the central theme of the 21st World Health Assembly where it was decided to expand the scope of the theme to cover most of the public health problems such as congenital malformations, poisonings in childhood leukemia, abortions, accidents, occupational diseases, behaviors as factors risk, the use of chemical additives, among others [1].

The Brazilian Unified Health System (SUS) incorporated the National Epidemiological Surveillance System established in 1975 by Law No. 6,259/1975 and Decree No. 78231/7 whose described the epidemiological surveillance as “a set of actions that provides the knowledge, detection or prevention of any change in the determinants and individual or collective health conditions, in order to recommend and adopt the measures of prevention and control of diseases and injuries” [2].

Despite the initiatives related to epidemiological surveillance, the epidemiological studies were the first to identify the main routes of HIV transmission, even before virus was discovered, a fact that enabled the implementation of prevention strategies by surveillance networks [3].

Many changes have occurred since the first cases of AIDS, including the transition to a manageable and chronic disease. The reduction of Aids mortality, added to continuous infection of new individuals, led to the increase of the population infected with HIV and the need for new confrontations [4]. The criteria for HIV/AIDS notification have been periodically revised to incorporate the current understanding of the disease and the necessary changes in medical practice. Over time, the AIDS surveillance data have identified changes in the patterns of transmission of HIV and reflect the effect of prevention programs on the incidence of HIV infection and coinfection [3].

HIV vertical transmission

Knowing the epidemiology of HIV vertical transmission is important

due to the high vulnerability of women and low income population groups [5-8], either by the little control over the risk of being infected by HIV or by the little or no access to care and appropriate supports when infected. Added to all this, it is the pregnancy and immediate exposure of newborn HIV.

Transmission from mother to child is the main route of infection among children, accounting for over 90% of children in infections [9]. Risk factors for mother to child transmission include high maternal viral load [10-12, advanced maternal immune deficiency [13], prolonged rupture of membranes [14] and the presence of sexually transmitted infection, type of delivery, prematurity and drug use [15-17]. Risk factors related to transmission of HIV through breast milk have been less studied, but transmission by this route was associated with either viral load as subclinical mastitis [18].

The results of AIDS Clinical Trial Group Protocol 076 (PACTG 076) still represent the greatest discovery in the context of HIV vertical transmission. This clinical trial showed a 67.5% reduction in the rate of vertical transmission of the virus when adopted chemoprophylaxis with AZT and not breastfeeding [19].

Rate of HIV vertical transmission

In the absence of antiretroviral therapy, the rate of HIV vertical transmission varied between 15% and 45%. However, with the knowledge and availability of prophylaxis, the rate dropped significantly to less than 2% in some countries. To achieve this level, it was necessary

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to conduct tests for HIV research during prenatal care, incorporate therapeutic regimens and replace breast milk by artificial [20-22].

In Brazil, the rate of HIV vertical transmission was estimated at 16% in São Paulo [23] and at 2.75% from 1996 to 2000 in Rio de Janeiro [24]. In Campo Grande-MS study conducted in HIV Reference Center from 1996 to 2001 described vertical transmission rate of 2.5% [25]. Another group of Rio de Janeiro State showed vertical transmission rate of 3.57% on 297 HIV positive pregnant women [26] while researchers of Porto Alegre identified data transmission rate of 3.2% [27]. A further study repeated by the group of Rio de Janeiro identified vertical transmission rate of 1.6% between 2002 and 2004 [28]. Still, in the state of São Paulo, when prenatal care coverage was 97% and prophylaxis of vertical transmission with antiretroviral 85.5%, a vertical transmission rate of 2.7% was observed [29,30]. A high-coverage public health prenatal program from Goiás State described 2.01% as rate of HIV vertical transmission [31].

The decline in the rate of vertical transmission of HIV observed in some Brazilian states showed that it was possible to improve the current situation. For this, it was important to know the national rate of transmission of the virus. In the early 2000s, a study conducted in 20 states and Brasília estimated vertical transmission rate of 6.8% [32]. The estimated national rate of vertical transmission of HIV suggests that the difference between the states is related to factors such as late diagnosis of HIV infection in pregnant women, poor compliance to the technical recommendations by the health services as not offering the serology for HIV during antenatal care and quality of care, especially in regions with lower service coverage and less access to health network [33].

In 2007, antenatal coverage in Brazil was above 85%, with a ratio of five prenatal medical appointments in the Brazilian Unified Health System (SUS), but the pregnant care quality was short of needs. As a result of the efforts made in all areas of care, such as the mandatory offer of HIV testing in antenatal services and the implementation of the Program for Humanization of Prenatal and delivery in 2010/2011 it was found that approximately 99% of pregnant women had at least one prenatal medical appointment, and, 69.9% had six or more appointments. In the same period, the coverage for HIV testing in prenatal care increased from 51.6% in 2002 [34] to 62.3% in 2006 and 83.5% in 2010 [35]. However, despite increased testing coverage for HIV in pregnant women, the rates observed in the country still remain lower than the rates of many developing countries, such as Botswana, Ukraine, Thailand and Argentina, which exceed 80% [36].

The fight against HIV vertical transmission

The most important interventions to reduce MTCT recommended by the National STD and AIDS included in 2007 the need to identify and treat HIV positive pregnant women and their children [37] and the implementation of Stork Network in 2011 to ensure humanized attention and increase HIV testing in Primary care [38]. However, at the beginning of the fourth decade of the AIDS epidemic, it was necessary to expand the field of prevention.

The English acronym PMTCT refers to prevention of HIV from mother to-child transmission, which is based on four pillars that aim to prevent new HIV infections in children and keeping mothers alive and healthy families. The four pillars are: halving the incidence of HIV among women of childbearing age (pillar 1), reduce the lack of family planning among women with HIV (pillar 2), providing prophylaxis with antiretroviral drugs to prevent transmission of HIV during pregnancy, labor and breastfeeding (pillar 3), and care, treatment and support for

HIV mothers and their families (pillar 4). Often, the acronym PMTCT is erroneously used to refer only to the pillar 3, which is the provision of antiretroviral [39].

It is important to state that in some developed countries, infection in children was almost eliminated [40]. In Cuba, vertical transmission of HIV is no longer a public health problem, and this was the first country to receive the WHO validation concerning the elimination of HIV transmission and mother to child syphilis [41].

In developed countries, the knowledge, the availability and proper use of therapeutic and biomedical tools have been sufficient to reduce the transmission of HIV [42]. On the other hand, developing countries face other difficulties related to transmission of the virus, such as hunger, poverty, poor education, lack of access to health services and quality of services provided [43]. The Brazil is between the two realities. It has one of the largest and most successful programs in the world of AIDS treatment and great social inequalities with its consequences.

When there is available medical care and people have access to this, the next step to consider is the quality of health service. However, it has been identified flaws in the detection of HIV infection among Brazilian pregnant women at all stages of the process, since no prenatally link establishment and late identification of HIV infection, to the absence of serological test and unknowing of HIV status before delivery [32,44]. These failures directly reflect the ongoing incidence of HIV vertical transmission.

The quality of care provided in health facilities, including the quality on the records reflect on the quality of information, or in the absence thereof, by the notification forms. Incomplete or ignored information may not reflect the reality of services provided in health facilities and weaken the national program to reduce vertical transmission of HIV [45], as hinder the evaluation of care, interventions and more featuring detailed epidemic [46]. However, despite prophylactic coverage does not cover 100% of HIV-positive pregnant women, about 200,000 new infections among children have been prevented worldwide since 2001 [47].

Challenges

Maybe it is time to improve over again the epidemiological surveillance and interconnect the Laboratory Tests Control System (SISCEL), Logistics Medicines Control Information System (SICLOM), Prenatal Information System (SISPRENATAL), Information System for Notifiable Diseases (SINAN) and Mortality Information System (SIM). The crossing of databases is an appropriate strategy to improve the quality of information; build, understand and evaluate indicators; allocate resources appropriately and plan and monitor the impact of interventions [48].

The organization of the local service network, referral and counter-referral services, and improvement of the quality of health care is also a challenge. Other strategies that could also help include active search strategy for HIV pregnant women and the directly observed therapy used in tuberculosis cases.

However, considering the complexity of HIV transmission, the discussion would be partial if it did not approach the issues of HIV pregnant woman herself, such as difficulty of understanding health information and their own condition of seropositive, difficulty of using health services and, mainly to adhere to therapeutic procedures [6]. Some women even choose not to share their HIV status in prenatal environments due to potential disclosure risks, including loss of

economic support, guilt, abandonment, physical and emotional abuse, discrimination and disruption of family relationships [49]. In this sense, it is necessary to implement strategies related to social determinants of health. Maybe one day not only Brazil but the world will be free of HIV.

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