Mother to Child Transmission of HIV: A Review

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ABSTRACT: Several reports reveal HIV infection/transmission among children. Breastfeeding is one the major source for HIV transmission from infected mother to child. Hence, this article will help to understand the causes of HIV infection among infants, transmission of HIV from infected mother to children and some basic knowledge to prevent HIV transmission. The findings would help in detection and care of affected mother and the epidemiology of HIV infection in infants and children. Majority of the studies reveal that the risk of transmission of HIV is higher in breastfed than the non-breastfed infants. Education and creating awareness is found to play an important role to prevent the infection of HIV/AIDS.

INTRODUCTION

The human immunodeficiency virus (HIV) is one of the leading infectious diseases in the world (Gayle *et al.,* 2001). In 2010, approximately 34 million people were affected with HIV (WHO, 2014; Balakrishnan *et al*., 2015). Acquired immune deficiency syndrome (AIDS) remains a challenge for healthcare workers around the world, particularly in developing countries (Gillespie, 2016). Mainly HIV is transmitted to infants from the infected mother (Chukwuemeka *et al.,* 2014). Nearly all (95%) children younger than 15 years acquired HIV infection prenatally. (Siberry, 2014). In fact, two million children within the age-group of 10-15 years, are affected with HIV (Vaz *et al*., 2011).

As of 2011, in the United States, 4500 children (ages <15years) had prenatal HIV infection, the predominant route of HIV infection in children is mother to children transmission (MTCT), including intrauterine, intrapartum, and postnatal (through breastfeeding) transmission (Zeh *et al*., 2011). The risk increases to as high as 50% for infants with prolonged breastfeeding (Stuebe, 2009).

HIV-1 and HIV-2 are enveloped single-strand RNA retroviruses. HIV-1 is overwhelmingly responsible for HIV infections worldwide, including the United States. HIV-2 causes infection predominantly in people from parts of West Africa, but it is less transmissible and generally associated with lower levels of viral replication and less severe disease (Rivera *et al.,* 2011).

All infants born to women with HIV infection should undergo a scheduled series of HIV tests that will lead to confirmation or exclusion of prenatal HIV infection (Rogers *et al*., 2001). If the maternal HIV status has not been determined, maternal HIV antibody testing (or, if the mother is not available, infant HIV antibody testing) should be requested to determine whether the infant is HIV exposed (George *et al*., 2014). According to the World Bank in 2011, the estimation number of people living with HIV was 2.08 million in India (Patel, 2014;Sarangal, 2015).

The following are the objectives of the study: a) Epidemiology of HIV infection in infants, and children; and b) Detection and care of mother affected with HIV.

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METHODOLOGY

The data was collected from original research articles, review paper, research community web pages. The search terms included HIV, child, various forms of the child (such as infant, minor, baby newborn), cognitive, psychosocial, emotional development, and neurological function.

FINDINGS

Based on 2008's data, HIV (human immunodeficiency virus) occurred in infants, which were 90% acquired through mother to child transmission (MTCT) of HIV. Of the 4,30,000 new infections — 2,80,000 were acquired during labour, and about 3,60,000 were acquired during the delivery. The majority were acquired during breastfeeding (Mothi *et al*., 2011).

In infants who acquire HIV around the time of delivery, disease progression occurs very rapidly in the first few months of life, often leading to death. To enable antiretroviral (ARV) prophylaxis to be given to infants as soon as possible after birth, all infants should have their HIV exposure status known at birth (WHO, 2010).

HIV-infected children suffer considerable morbidity and mortality. HIV-infected children along with their families suffer tremendous psychological problem (Wiener *et al.,* 2007). HIV was considered as a fatal disease (Colvin, 2011). Psychological support is very important for HIV-affected children and their families (Vranda *et al.,* 2013). Moreover, many of these children are becoming orphans having lost both the parents to the disease and require a lot of economical and psychological support (Kaushal and Upadhyay, 2013). Micronutrient deficiencies are a common problem in HIV-infected children (Singhal *et al.,* 2002). The number of cases among the children in the United States is decreasing because the increasing rate is successful to prevent prenatal transmission as well as the availability of effective treatments (Burchett *et al.,* 2003). Tuberculosis (TB) is much higher among HIV-infected children (Nuttall *et al*., 2011). Approximately, 11% of malnutrition is responsible for global disease burden and HIV-affected child deaths worldwide is 35% (Trehan *et al*., 2012). In Sub-Saharan Africa, HIV affects a wide age range of children, rendering them susceptible to infection and malnutrition (Heikens *et al*., 2008). India has more under nutrient HIV-infected children than Africa. India has 17-61% infected children where as Africa has 14-31% of infected children (Swetha *et al*., 2015).

HIV or Human Immunodeficiency Virus can be transmitted from infected mother to their children. The risk of transmission is 15-30% in non-breastfed infants and 20-45% in breastfed infants (Anoje *et al.,* 2012). In 2012, the total of 2, 60,000 children were infected with HIV, and 6, 70,000 prenatal infections were prevented in low and middle-income countries in the year 2009-2012 (Khakshour *et al.,* 2014). The symptoms of HIV vary depending on the stage of infection. Though people living with HIV tend to be most infectious in the first few months, many are unaware of their status until later stages (Akinyinka *et al.,* 2016). The first few weeks after initial infection, individuals may experience no symptoms or an influenza-like illness including fever, headache, rash or a sore throat (WHO, 2015).

Mandatory testing by a health-care provider, authority or by a partner or family member is not acceptable as it undermines good public health practice and infringes on human rights (Csete *et al.,* 2007). Some countries have introduced or are considering, self-testing as an additional option. HIV self-testing is a process whereby a person who wants to know his or her HIV status collects a specimen, performs a test and interprets the test results in private (Macías *et al.,* 2004). HIV self-testing does not provide a definitive diagnosis; instead, it is an initial test which requires further testing by a health worker (Paudyal *et al.,* 2015). Although there is still no cure for HIV, treatment is now effective at allowing people with HIV to live their lives as normally as possible (Broder, 2010). Since the introduction of medicines to treat HIV, the death rates from AIDS have reduced dramatically. With effective treatment, very few people go on to develop AIDS (Kaushal *et al*., 2013).

HIV can be suppressed by combination ART consisting of 3 or more ARV drugs (Günthard *et al.,* 2014). ART (Antiretroviral therapy) does not cure HIV infection but controls viral replication within a person's body and allows an individual's immune system to strengthen and regain the capacity to fight off infections (Duggal *et al.,* 2012). Guidelines

recommend that anyone infected with HIV should begin antiretroviral treatment as soon after diagnosis as possible (Khakshour *et al.*, 2014).

CONCLUSION

The study evaluated that the mother to child transmission (MTCT) are spread from infected mother to their children. In the rural area approximately, 75% of HIV transmission is found due to lack of awareness. Full knowledge on MTCT was associated with women's education and their occupation, information received from antenatal care service providers and discussion with male partners on issues of antenatal care and HIV/AIDS. HIV is evolving in low and middle-income countries. Low bone mineral density (BMD) is very common in HIV-infected infants and children. Lots of nutritional deficiencies have occurred to them. The chances of HIV infection are higher during breastfeeding from the labour and delivery. Without any specific interventions, HIV-infected women will pass the virus to their infants during pregnancy or delivery in about 15-25% of cases. During breastfeeding 30-45% chances of infants may become infected in the postnatal period. Where interventions are not available, there breastfeeding may be responsible for one-third to one-half of HIV infections in infants. The urban population has more access to information and education than the rural one. Maternal education is most important to protect the disease. The antiretroviral therapy (ART) does not cure the infectious disease but controls the viral replication.

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