Journal of Advances in Medicine and Medical Research

33(13): 77-81, 2021; Article no.JAMMR.68960
ISSN: 2456-8899
(Past name: British Journal of Medicine and Medical Research, Past ISSN: 2231-0614, NLM ID: 101570965)

Role of Mothers' Awareness of HIV Status in Prevention of Mother-to-Child Transmission

Jiman He[1*]

[1]Liver Research Center, Brown University, Providence, RI 02903, United States.

Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/JAMMR/2021/v33i1330957
Editor(s):
(1) Dr.Chan-Min Liu, Xuzhou Normal University, China.
Reviewers:
(1) Parikipandla Sridevi, Indira Gandhi National Tribal University, India.
(2) Reena Mohanlal, University of the Witwatersrand, South Africa.
Complete Peer review History: http://www.sdiarticle4.com/review-history/68960

Opinion Article

Received 25 March 2021
Accepted 05 June 2021
Published 08 June 2021

ABSTRACT

Current guidelines on HIV prevention conflict over whether oral exposure to HIV positive blood is a risk for transmission. This issue is especially important for young children, because, 30–80% of people infected with HIV have at least one oral manifestation, with the most frequently occurring ones often bleeding, and children born to HIV infected mothers are often exposed to the blood through multiple ways (e.g. kissing and sharing spoon, cups, or food, etc.). For the present paper, I examined data collected in sub-Saharan Africa from 2000 to 2020 which showed that, the decline in annual new HIV infections in young children was closely correlated with an increase in the proportion of women aware of their HIV status. This finding suggests that, mothers' behavioral change (e.g. avoiding kissing and sharing spoon, cups, or food, etc.) due to awareness of their HIV status played an important role in prevention of mother-to-child transmission, and testing for HIV should be pursued for all pregnant women in high prevalence areas.

Keywords: Awareness of HIV status; mother-to-child transmission; oral manifestation; risk factor; oral bleeding.

1. INTRODUCTION

HIV infection is still one of the deadliest diseases after a decades-long effort to fight the disease. Current guidelines on HIV risk factors are conflicting with each other [1]. These suggest potential problems with our understanding of the risk factors for transmission. Guidelines on dental

**Corresponding author: E-mail: hejee99@yahoo.com, jiman_he@brown.edu;*

occupational safety state that, exposure of oral mucosa to bloody fluid of a patient is a risk for HIV transmission, and suggest immediate flushing of the exposed site with water [2–4]. In conflict, general prevention guidelines state that, there is little to no risk from oral activities that lead to the exposure [5,6]. This issue is important for children, because, 1) 30–80% of people infected with HIV have at least one oral manifestation [7], and the most frequently occurring oral manifestations often give rise to bleeding [8–10]; 2) children born to HIV infected mothers are often exposed to the blood through multiple ways.

This paper discussed the data collected in sub-Saharan Africa (SSA) over the last two decades, and showed that, the decline in annual new HIV infections in young children was closely correlated with an increase in the proportion of women aware of their HIV status. This finding suggests that, mothers' behavioral change due to awareness of their HIV status played an important role in prevention of mother-to-child transmission (PMTCT).

Fig. 1a showed the annual new infections among children aged 0–9 years in SSA from 2000 to 2018 (blue curve) [11]. The number of new infections decreased most dramatically during 2006–2012, and decreased at a slower rate after 2012.

Fig. 1b reported the percent of women living with HIV who were aware of their status in SSA from 2000 to 2020 (purple curve) [12]. The proportion increased most dramatically during 2005–2011, and increased at a slower rate after 2011. This trend closely matched the trend shown in Fig. 1a.

Antiretroviral therapy (ART) is commonly used in PMTCT, and was claimed to have averted millions of new HIV infections among children since 2000. The percentage of pregnant women with HIV receiving ARTs for PMTCT in SSA increased rapidly during 2010–2014 (Fig. 1c) [11], correlating well with the decrease in new HIV infections among children during 2010–2014 (Fig. 1a). However, the percentage of pregnant women with HIV receiving ARTs changed little after 2014 (84.2% in 2015 to 86.5% in 2019). This trend did not match Fig. 1a which showed that, new HIV infections among young children in SSA kept declining after 2014. Fig. 1c had no data before 2010.

Fig. 1d is an often seen figure cited in many articles showing a correlation between the decrease in global new HIV infections among children and the increase in the percentage of pregnant women with HIV receiving ARTs for PMTCT [13]. There was a close correction between the two factors between 2005 and 2009 and between 2010 and 2014. But, there was no correlation between 2009 and 2011. Moreover, this figure had no data after 2015, a period which showed no correlation between the two factors.

A women received ARTs for PMTCT only when she was identified as having been HIV infected. Therefore, there was an overlap in the effects of women's HIV status awareness, and, of receiving ARTs to reduce infections. However, even though there was no correlation between the increase in pregnant women receiving ARTs and the decrease in new infections among children during 2009–2011 and after 2014, there was still a correlation between women's HIV status awareness and the decrease in new infections among children.

It is common for people to be cautious about close contact with someone who has a deadly infectious disease. Mothers aware of their HIV status would be cautious with theiractivities to protect their children, for example, avoiding kissing and sharing spoon, cups, or food, etc. In contrast, infected mothers unaware of their HIV status would be less likely to be cautious with those activities. Since HIV infected people often have oral bleeding lesions and can easily leave blood on food, spoon, etc., avoiding those activities means avoiding exposure of children's oral mucosa to blood contamination. To our knowledge, studies have neither shown that mucosa provides stronger protection than skin against HIV infection, and nor provided data to prove that, that exposure is not a risk for transmission. In contrast, there is direct data which demonstrated that, oral exposure was a risk. For example, estimations of dental occupational accidents established that, the risk of transmission per exposure was quite high (0.09%) [3]. Studies in monkeys showed that the risk of such exposures was very high [14,15]. It is a common practice that, touching HIV positive blood without gloves is prohibited. These facts suggest that, exposure to food, spoons, cups, etc. contaminated by infected mothers is a risk, and hence, is a significant reason for why an increase in the proportion of women aware of their HIV status is closely correlated with the decline in new infections among children.

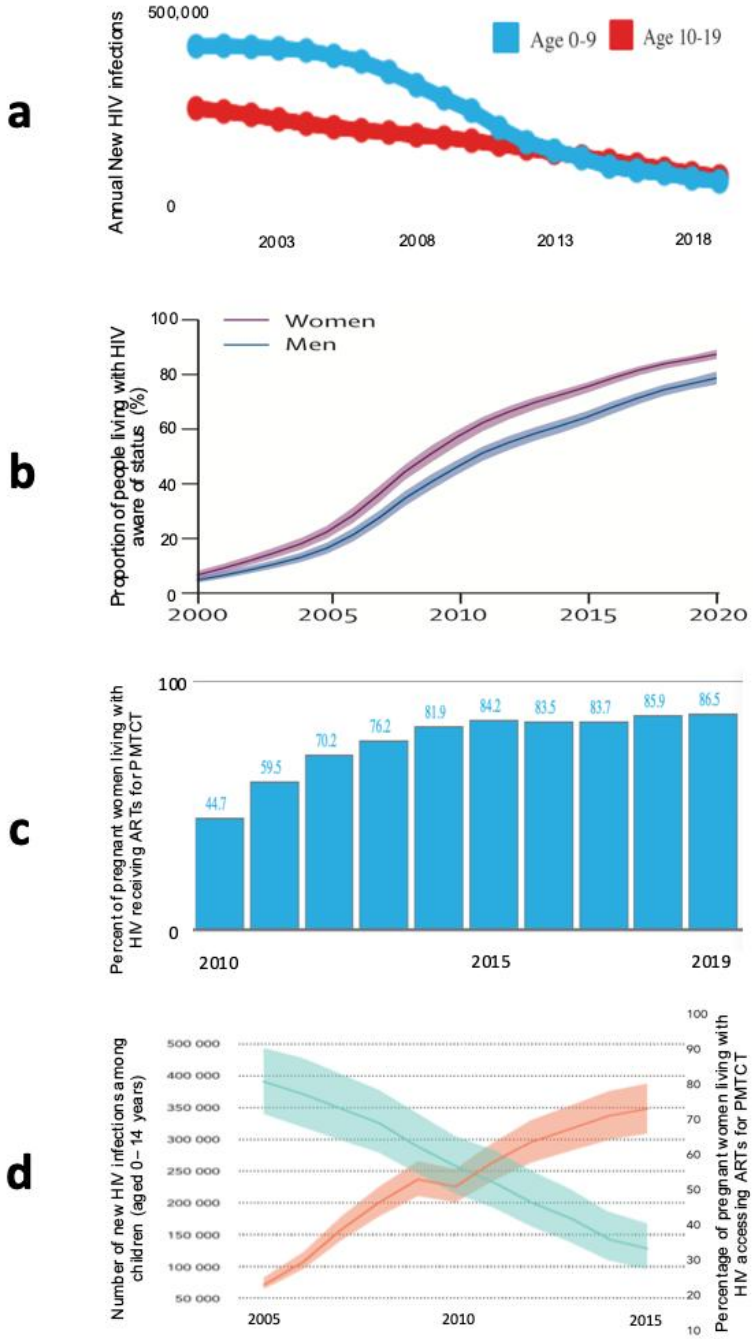

Fig. 1. a) Annual new HIV infections among children, SSA. Source: UNICEF [11]; b) Proportion of people living with HIV who are aware of their HIV status, SSA. Source: Giguère, et al [12]; c) Percentage of pregnant women living with HIV receiving ARTs for PMTCT, SSA. Source: UNICEF [11]; d) Global new HIV infections among children (aged 0–14 years) and percentage of pregnant women living with HIV receiving ARTs for PMTCT. Source: UNAIDS [13]

Studies exploring the role of oral exposure in HIV transmission are very rare. There were 3 reported studies which explored the potential risk of pre-mastication for HIV transmission [16-18]. The results conflicted with each other. Some reported that infants obtained HIV through pre-mastication, but other showed that, the infection rate in infants who had ever received pre-chewed food from their mothers was not different from that in the control infants who had not ever

received pre-chewed food from their mothers. The sample sizes of these studies were small. A significant limiting factor of the study is that, the infants who had not received pre-chewed food may have often had exposed to oral blood of their mothers through many other ways (e.g., kissing, or sharing spoon, drinking cups, food, etc.).

2. CONCLUSION

Mothers' awareness of their HIV status is important for PMTCT. Although access to ARTs may not be available to all pregnant women, testing for HIV should be pursued for all pregnant women in high prevalence areas. Further study in the field are warranted.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. He J. Guidelines on risk factors for HIV transmission are conflicting. World Journal of AIDS. 2020;10:195–199. Available:https://doi.org/10.4236/wja.2020.103017
2. United States OSHA. OSHA and the bloodborne pathogen standard; 2018. Available:https://oshaguard.com/blogs/news/bloodborne-pathogen-standard-and-osha Accessed July 18, 2020.
3. United States Public Health Service. Updated US Public Health Service guidelines for the management of occupational exposures to human immunodeficiency virus and recommendations for postexposure prophylaxis. Available:https://www.jstor.org/stable/10.1086/672271#metadata_info_tab_contents Accessed August 2, 2020.
4. United States CDC: Bloodborne infectious diseases: HIV/AIDS, hepatitis B, hepatitis C. Available:https://www.cdc.gov/niosh/topics/bbp/emergnedl.html Accessed August 23, 2020.
5. UNAIDS. Living in a world with HIV. Available:https://bangladesh.iom.int/sites/default/files/publication/Living-in-a-world-with-HIV-information-for-UN-systempersonnel-and-their-families.pdf
6. United States CDC. HIV Transmission. Available:https://www.cdc.gov/hiv/basics/transmission.html Accessed November 2, 2020.
7. Saini R. Oral lesions: a true clinical indicator in human immunodeficiency virus. J Nat Sci Biol Med. 2011;2:145–150.
8. Saravani S, Nosratzehi T, Mir S. Oral manifestations and related factors of HIV positive patients 5 in south-east of Iran. J Dent Mater Tech. 2017;6:11–8.
9. Coogan MM, Greenspan J, Challacombe SJ. Oral lesions in infection with human immunodeficiency virus. Bulletin of the World Health Organization. 2005;83:700–706.
10. Sen S, Mandal S, Bhattacharya S, Halder S, Bhaumik R. Oral manifestations in human immunodeficiency virus 10 infected patients. Indian J Dermatol. 2010;55:116–118.
11. UNICEF. HIV estimates for children dashboard. Available:https://data.unicef.org/resources/hiv-estimates-for-children-dashboard/ Accessed March 28, 2021.
12. Giguère K, Eaton JW, Marsh K, et al. Trends in knowledge of HIV status and efficiency of HIV testing services in sub-Saharan Africa, 2000-20: a modelling study using survey and HIV testing programme data. Lancet HIV; 2021.
13. UNAIDS. Get on the Fast-Track. Available:https://www.unaids.org/sites/default/files/media_asset/Get-on-the-Fast-Track_en.pdf
14. Stahl-Hennig C, Steinman RM, Tenner-Racz K, et al. Rapid infection of oral mucosal-associated lymphoid tissue with simian immunodeficiency virus. Science. 1999;285:126–125.
15. Baba TW, Trichel AM, An L, et al. Infection and AIDS in adult macaques after nontraumatic oral exposure to cell-free SIV. Science. 1996;272:1486–1489.
16. Gaur AH, Dominguez KL, Kalish ML, Rivera-Hernandez D, Donohoe M, Brooks JT, et al. Practice of feeding premasticated food to infants: A potential risk factor for

HIV transmission. Pediatrics. 2009;124:658–666.

17. Ivy W 3rd, Dominguez KL, Rakhmanina NY, Luliano AD, Danner SP, Borkowf CB, et al. Premastication as a route of pediatric HIV transmission: case-control and cross-sectional investigations. J Acquir Immune Defic Syndr. 2012;59:207–212.

18. Gaur AH, Cohen RA, Read JS, Hance LA, Dominguez K, Alarcon JO, et al. Prechewing and prewarming food for HIV-exposed children: a prospective cohort experience from Latin America. Aids Patient Care and STDs. 2013;27:142–145.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/68960