INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN BIOLOGY AND MEDICINE
ISSN: 2455-944X
www.darshanpublishers.com
Volume 4, Issue 5 - 2019

Review Article

DOI: http://dx.doi.org/10.22192/ijcrbm.2019.04.05.004

An update on ABO blood group in HIV infection

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Abstract

HIV infection has attracted attention to researchers and every sensible individual in the society because of its ravaging effects on human lives and delicate nature of interaction with human cells handicapping discovery of preventive and curative therapies. A lot of studies focused on leucocytes of the patients. There should be shift to studies in erythrocytes of the HIV patients especially on the ABO blood group that understand the link such could pose to HIV infection. There is discordance in previous studies on ABO blood groups and HIV infection. A breakthrough here may help in the prevention, control and management of HIV infection and improve lives of the patients and bring hopes to a lot of devastated individuals in the society.

Keywords: ABO blood groups, HIV infection, Association of ABO to HIV infection

ABO blood group in HIV infection

It is clearly seen that a lot of studies on HIV concentrated on cells of the immune system to the exclusion of viral interactions with red blood cells. There is a report that suggested that erythrocytes may be crucial in the pathogenesis of HIV as they enhance viral infectivity by binding free viruses as well as viral immune complexes and through such binding transfect HIV susceptible cells (Pendu *et al.*, 2006; Beck *et al.*, 2009).

HIV infection has been reported to occur in selected blood groups in some regions of the world. A study by Sayal *et al.* (1996), in India reported a preponderance for infection in group O Rh (D) positive men and least among group B positive and negative ones. However, a close examination of the results showed insufficient statistical analysis rendering the differences statistically insignificant. Related studies by Nueli *et al. (*2004) and Dirisu *et al.* (2011), suffered related deficiencies. In these studies, group O positive individuals were thought to be highly susceptible, but again the studies lacked the statistical rigor to indicate the level of significance and have challenged by other researchers (Ukaejiofo and Nubila, 2006).

It would appear that scientific information does not support a potential role of ABO blood groups in HIV infection. Evidence from other studies showed the contrary for group O individuals. Since HIV virions have been shown to acquire the blood group antigens of the infected individuals (Arendrup *et al.* 1991), such virions would be neutralized by naturally occurring antibodies in group O individuals thus offering protection to blood group discordant couples. It is shown that this protection will not be available if the source of infection was of a similar blood group. In a separate study by Abdulazeez and Colleagues (2008) working with HIV-1 and HIV-2 reported a higher prevalence of HIV-2 (71.4%) compound to HIV-1 (7.1%) in the AB blood group and that Rh (D) positive (97.8%) was more susceptible than D negative (2.2%).

The lack of direct empirical evidence for ABO blood groups doses not obliterates the possibility of associations in other blood groups. Since secreted blood group susbstances can be absorbed onto lymphocyte membranes, the presence of these antigens could potentially alter cell behavior. Blood group antigens being glycoproteins and glycolipids are highly charged molecules that are bond to affect their molecular microenvironment, including protein confirmation and receptor/CD4 localisation and function (Lund *et al.,I 2009)*. Glycosphingolipids and glycoproteins have in fact been demonstrated to facilitate fusion of HIV-1 with CD4 cells by independent researchers, thus acting as alternative co-receptors for the virus (Hammache *et al.*, 1999).

Conclusion

HIV infection is known to overwhelm the entire systems of the infected individual with rapid replications. Although, the point of attachment may be on leucocytes, the erythrocytes could have a role in the pathogenesis of HIV in the patient. There is lack of agreement by many researchers on the association of ABO blood groups to HIV infection. More studies should be conducted on this area especially at molecular level to enable the society understand if there are predisposing factors on the red blood cells in connection to ABO blood groups and chance of being infected with HIV and those who may suffer most among these blood groups.

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Quick Response Code	Subject: Medical Sciences

How to cite this article:
Obeagu Emmanuel Ifeanyi, Chukwurah Ejike Felix and Ochei Kingsley Chinedum. (2019). An update on ABO blood group in HIV infection. Int. J. Curr. Res. Biol. Med. 4(5): 17-19.
DOI: http://dx.doi.org/10.22192/ijcrbm.2019.04.05.004