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Case Report

CO-INFECTION AMONG VOLUNTEERS BLOOD DONORS: IMPLICATIONS FOR SAFE BLOOD

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ABSTRACT
Transfusion medicine has become an integral component of all healthcare delivery systems in preventing transmission of infectious diseases through blood and blood products. Measures for safe transfusion services include donor selection criteria's, donor interviews, donor deferral and serological test for infective diseases markers. Epidemiological studies of blood-borne diseases are important for revealing the risk groups and identifying the risk factors. Screening helps to solve difficulties in collecting information among healthy populations. Co-infection with HIV and HBV and HCV respectively is common, because of shared modes of transmission. We present two first time, male, voluntaries blood donors who were co-infected by both HIV and HBV, HCV pathogens respectively and were referred for subsequent follow up. Improved surveillance and periodic epidemiological studies should be undertaken among the donors because co-infection has serious implications for universal access for safe blood transfusion.

Key Words: *HIV, HBV, HCV, Co-Infection, Blood Donors, Blood Transfusion*

INTRODUCTION
The goal of any blood transfusion service is to provide blood components/products that are safe for transfusion; that pose minimal risk of transfusion-transmissible infections. To achieve maximum safety at an acceptable cost, requires a multi-layered risk reduction strategies including proper donor screening.
HIV/ HBV/ HCV have similar routes of transmission, namely through blood and blood products. Sharing of needles and sexual activities dual transfusion of viruses and thereby makes co-infection or super infection a common event.
Blood transfusion is a unique technology that blends science with altruism. Though its collection, processing and use are technical, its availability depends entirely on the extraordinary generosity of the blood donor who donates this most precious of gifts-the gift of life. Safe transfusion not only requires the application of science and technology to blood processing and testing, but also social mobilization to promote voluntary blood donation by sufficient numbers of people who are healthy and are low risk on infections that can be transmitted to the recipients of their blood.
Blood transfusion contributes to the ever widening pool of these infections, whereby even asymptomatic carriers can transmit the infection. [McNair *et al.,* (1992); Ockenga *et al.,* (1997); Brendon and Thyagarajan (1998) and Kumar *et al.,* (2006)] Mandatory blood screening reduces risk of transmission and also gives an idea about the prevalence rates of the infections in the community. Despite evidence that suggests increasing prevalence of HBV / HIV and HCV /HIV co-infections, there has been no published report about the frequency of HIV / HBV / HCV co- infections among the voluntary blood donors in our region.

CASES
Two male, first time voluntary blood donors of 32 and 35 years respectively attended a camp. Standard Operating Procedure (SOP) with regard to donor registration and examination were followed. Upon enrollment, trained staff administered questionnaire eliciting information on socio-demographic and behavioral characteristics.

Interviews and test results were given in local language, by staff members trained in obtaining informed consent and conducting interviews on risk factors. Recruitment and data collecting were conducted under the supervision of blood bank officer.

Serum samples for HIV, HbsAg and HCV by Vitros ECI Chemiluminescence (Johnson and Johnson) were tested and a dual sero-positivity for the same were noted. Confirmation for HIV was done by Western Blot. Reactive specimens were retested in duplicate and determined to be positive if either or both of the repeat tests were reactive. Their immediate families were found to be sero-negative.

Liver function tests were studied and the results were correlated with the respective serological findings. Molecular analysis for the same were not done due to lack of resources.

Both the cases were referred to ICTC for regular follow up as per NACO guidelines.

DISCUSSION

Every blood transfusion carries a potential risk for transmissible diseases. This reflects the need and importance of the mandatory screening of the above infectious markers in blood donations. The prevalence of infection among blood donors has been used as a surrogate marker for the prevalence of infection in the population at large. Kumar *et al.,* (2006) Although certain pitfalls, like the exclusion of people below 18 years and over 60 years and low number of female donors have been cited, it is still an important indicator of the disease burden. Stringent measures need to be taken on urgent basis including dissemination of information, strict screening of blood and blood products, inclusion of the nucleic acid amplification test, antibody to hepatitis B core antigen and other sensitive markers to the mandatory screening protocol, better donor recruitment, promoting voluntary donation, safe sexual practices, proper sterilization of instruments, proper disposal of contaminated material, and immunization of people at risk, particularly health care workers. Rockstroh (2006)

HIV is a RNA virus and HBV a DNA virus but both integrate into the host cell genome and utilize reverse transcriptase in replication with susceptibility to antiretroviral therapy (ART). Co-infection leads to a complex immuno-pathological disorder and enhances the kinetics of viral replication. Hence routine evaluation of HIV markers should be carried out in all the HBsAg and HCV positive individuals for better prognosis as it has serious implications with regard to the mandatory serological testing and universal precautions Vallet and Pol (2006), especially in young population with high risk behaviors.

In many developing countries the risk are further compounded by an inefficient infrastructure which include shortage of trained staff, irregular supplies of test kits with poor quality and the lack of appropriate cold chains facilities. Universal safety measures are further compromised by fragmented supply systems with varying technical standards with no central supervision.

Evidence based strategies for blood safety and availability have been successfully implemented by most developed nations. Despite tangible progress, many developing counties are unable to meet their requirements for blood and components. In developing countries, safe transfusion services has been largely restricted to major cities with no assured universal access.

Few reports are available regarding co-infection among blood donors in India with no available data regarding the same among the donors of our region. Kumar *et al.,* (2006) reported 2.9% co-infection of HBV and HIV in cirrhotic patients whereas Chowdary *et al.,* (1999) showed a prevalence of 0.87%.

Our study endorses the NACO blood safety guidelines along with individualized counseling. This case highlights the importance's of improved surveillance and periodic epidemiological studies to monitor, prevent and gain more knowledge about co-infection. There is a need to collect date at the national, state, and district level for effective supervision of the universal blood safety measures.

The problem of co-infection may be greater than generally anticipated and presents new challenges which required support from government and community. While effective vaccines currently exists for HBV, a fully protective HCV vaccine is not yet available and current treatment methods for HCV infection are not universally accessible.

CONCLUSION

There is an urgent need to address the challenges in ensuring access to a safe and sufficient blood supply Bonacini (2002). This can be achieved by 100% voluntary blood donation with effective quality assurance and better technological up-gradation. Only continuous improvement, careful donor selection, proper selection of sensitive screening tests, adequate quality control measures can ensure the universal access to safe blood Vallet and Pol (2006).

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