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Ensuring Blood Safety through Donor Notification and Recall Programmes for TTIs: A Seven-Year Analysis of Seroprevalence and Counselling Outcomes

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A B S T R A C T

Background: Notification and recall systems for blood donors are central to transfusion safety, as they enable early identification of transfusion-transmissible infections (TTIs), timely counselling, and follow-up.

Objective: This study sought to evaluate temporal patterns in donor seroprevalence, outcomes of telephone-based notification, and the influence of the COVID-19 pandemic on recall effectiveness.

Methods: A retrospective study was carried out on 14,406 whole blood donations between August 2015 and July 2022 at a tertiary care blood centre in western India. Screening was performed for HBsAg, HCV, HIV, and syphilis. Donors repeatedly reactive on screening were informed confidentially by telephone and counselled. Seroprevalence was examined annually and across three timeframes: pre-COVID (2016–2019), COVID (2020–2021), and post-COVID (2022). Data analysis employed chi-square tests and logistic regression.

Results: Of 14,406 donations, 377 (2.62%) were reactive: HBsAg 1.47%, HCV 0.40%, HIV 0.48%, syphilis 0.27%. Differences in overall prevalence across timeframes were not statistically significant (χ^2=3.26, p=0.196). However, HCV prevalence showed a significant upward trend (p=0.008). Median recall completion was 64.2% (range 58.2–74.1%), with no difference across study periods.

Conclusion: Donor notification programmes ensured moderate recall effectiveness throughout seven years. The notable rise in HCV prevalence, particularly during and after the COVID-19 phase, highlights the need for accurate donor data collection, stronger recall systems, and enhanced educational interventions.

Keywords: Blood donors; Transfusion-transmissible infections; Donor notification; Telephonic counselling; Blood safety; HBsAg; HCV; HIV; Syphilis

INTRODUCTION

Ensuring transfusion safety requires minimising the risk of transfusion-transmissible infections (TTIs), including HIV, HBV, HCV, and syphilis. Despite advances in diagnostic technology, seroreactive donations continue to be detected, underscoring the need for systematic donor management. Programmes for donor notification and recall are internationally recognised as essential components of transfusion safety, as they not only inform seroreactive donors but also provide counselling and facilitate recipient tracing when feasible (1–3).

The COVID-19 pandemic disrupted multiple facets of healthcare delivery and likely influenced blood donation patterns, donor demographics, and recall outcomes. Global reports suggest significant changes in blood supply and infection risks during the pandemic (4,5). However, data from India on the impact of this period remain limited.

This study analysed seven years of data from a tertiary blood centre in western India to (i) assess annual and period-wise prevalence of TTIs, (ii) evaluate the effectiveness of telephonic notification and counselling, and (iii) examine the impact of the COVID-19 pandemic on recall outcomes.

Materials and Methods

This retrospective analysis included all whole blood donations made between August 2015 and July 2022 at a tertiary care blood centre in western India. Screening protocols involved testing donor samples for HBsAg, anti-HCV, and anti-HIV-1/2 using third-generation ELISA or chemiluminescence assays. Syphilis testing was performed using rapid plasma reagin (RPR) with confirmation by Treponema pallidum haemagglutination assay (TPHA) as per the institutional protocols. Donations showing reactivity on screening were classified as seropositive. Seroreactive donors were notified by telephone within 7–14 days. Notification and counselling were conducted confidentially by trained personnel, and recall was considered successful if counselling was completed. Donors unreachable or unwilling to participate were categorised as non-contacted.

For analysis, the study period was stratified into pre-COVID (2016–2019), COVID (2020–2021), and post-COVID (2022). Outcomes assessed were: (i) annual and cumulative prevalence of each infection, (ii) recall completion rates, and (iii) proportions of donors not contacted.

Data were entered in Microsoft Excel and analysed using SPSS version 29.0. Seroprevalence and recall rates were expressed as percentages and compared between groups using chi-square tests. Temporal trends were examined using logistic regression, with year as a continuous predictor. A two-tailed p-value <0.05 was considered statistically significant.

Results

Seroprevalence:

Among 14,406 donations, 377 (2.62%) were reactive: HBsAg 212 (1.47%), HCV 57 (0.40%), HIV 69 (0.48%), and syphilis 39 (0.27%). Annual prevalence ranged from 1.69% to 3.78%. Logistic regression revealed a borderline upward trend overall ($p=0.061$) and a statistically significant increase for HCV ($p=0.008$).

Period-wise prevalence:

- Pre-COVID: 2.50%
- COVID: 3.12%
- Post-COVID: 2.69%

The differences were not statistically significant ($\chi^2=3.26$, $p=0.196$). However, HCV prevalence rose significantly across timeframes ($\chi^2=24.08$, $p=5.9\times10^{-6}$), peaking in 2022.

Recall outcomes :

Median recall completion was 64.2% (range 58.2–74.1%). No significant differences were found across study periods ($\chi^2=1.65$, $p=0.437$). Of the 377 seroreactive donors, 242 were counselled successfully, while 135 (35.9%) could not be reached. Non-contact was attributed to unreachable or switched-off phones, wrong or outdated numbers, lack of response, incomplete or illegible records, relocation, or refusal. Detailed categorisation was inconsistently documented.

DISCUSSION

This study demonstrates that transfusion-transmissible infections remain a concern in donor populations, with HBV being the most prevalent, followed by HIV, HCV, and syphilis. Importantly, the analysis identified a significant upward trend in HCV prevalence, particularly during and after the COVID-19 phase. Similar shifts have been observed in other healthcare settings during the pandemic (6,7). The rise in HCV could reflect behavioural changes among donors, barriers to healthcare access, or previously undetected risks.

Donor notification and recall systems achieved moderate success, with approximately two-thirds of seroreactive donors receiving counselling. This figure, although consistent with global reports, highlights persistent challenges. Chief among these were incomplete or incorrect contact details, a recurring obstacle in donor management programmes (8). Despite pandemic-related restrictions, recall rates remained stable, demonstrating resilience of the system and alignment with best practices (3).

Notification and counselling serve as a cornerstone of transfusion safety by not only protecting recipients but also enabling early medical intervention for donors themselves. Both the World Health Organization (WHO) and the National AIDS Control Organization (NACO) regard donor notification as an ethical obligation and an essential public health measure (3,9). Beyond individual care, these programmes contribute to national disease surveillance, identifying previously undiagnosed infections and supporting control strategies (10).

To strengthen recall systems, improvements in donor registration processes are essential, particularly accurate and complete collection of contact details. Adoption of digital platforms—such as SMS alerts, mobile applications, and structured outcome coding—can enhance recall efficiency (11). Integration with hospital information systems and national public health authorities would further ensure continuity of care and facilitate recipient tracing. Additionally, gradual implementation of nucleic acid testing (NAT) could enhance detection sensitivity (12).

CONCLUSION

Over seven years, donor notification and recall programmes demonstrated moderate success, with counselling rates of about two-thirds. The significant rise in HCV prevalence during and after COVID-19 underscores the urgent need for more robust donor education, systematic recall documentation, and improved data capture during donor registration. Recognising donor notification as both an ethical duty and a public health intervention is essential for strengthening transfusion safety and supporting infection control that bridges transfusion medicine with disease prevention.

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REFERENCES

1. Dodd RY. Current risk for transfusion transmitted infections. Curr Opin Hematol. 2007 Nov;14(6):671-6. doi: 10.1097/MOH.0b013e3282e38e8a. PMID: 17898573.
2. Kleinman S, Williams AE. Donor selection procedures: Is it possible to improve them? Transfus Med Rev. 1998;12(4):288-302. doi:10.1016/S0887-7963(98)80004-7.
3. World Health Organization. Screening donated blood for transfusion-transmissible infections: Recommendations. Geneva: WHO; 2010.
4. Stanworth SJ, New HV, Apelseth TO, et al. Effects of the COVID-19 pandemic on supply and use of blood for transfusion. Lancet Haematol. 2020;7(10):e756-e764.
5. Pagano MB, Hess JR, Tsang HC, Staley E, Gernsheimer T, Sen N, Clark C, Nester T, Bailey C, Alcorn K. Prepare to adapt: blood supply and transfusion support during the first 2 weeks of the 2019 novel coronavirus (COVID-19) pandemic affecting Washington State. Transfusion. 2020 May;60(5):908-911. doi: 10.1111/trf.15789. Epub 2020 Apr 27. PMID: 32198754.
6. Arora D, Arora B, Khetarpal A. Seroprevalence of HIV, HBV, HCV and syphilis in blood donors in Southern Haryana. Indian J Pathol Microbiol. 2010 Apr-Jun;53(2):308-9. doi: 10.4103/0377-4929.64295. PMID: 20551540.
7. Lange SJ, Ritchey MD, Goodman AB, Dias T, Twentyman E, Fuld J, Schieve LA, Imperatore G, Benoit SR, Kite-Powell A, Stein Z, Peacock G, Dowling NF, Briss PA, Hacker K, Gundlapalli AV, Yang Q. Potential Indirect Effects of the COVID-19 Pandemic on Use of Emergency Departments for Acute Life-Threatening Conditions - United States, January-May 2020. MMWR Morb Mortal Wkly Rep. 2020 Jun 26;69(25):795-800. doi: 10.15585/mmwr.mm6925e2. PMID: 32584802; PMCID: PMC7316316.
8. O'Brien SF, Naicker K, Osmond L, Holloway K, Drews SJ, Bigham M, Goldman M. Notification of blood donors who test positive for transfusion-transmissible infections. Vox Sang. 2025 Apr;120(4):394-400. doi: 10.1111/vox.13796. Epub 2025 Jan 14. PMID: 39809317; PMCID: PMC12017946.
9. National AIDS Control Organization (NACO). Guidelines for HIV testing. New Delhi: NACO; 2015.
10. Glynn SA, Kleinman SH, Schreiber GB, et al. Trends in incidence and prevalence of major transfusion-transmissible viral infections in US blood donors, 1991 to 1996. JAMA. 2000;284(2):229-35.
11. Ou-Yang, J., Bei, CH., Liang, HQ. *et al.* Effective methods for reactivating inactive blood donors: a stratified randomised controlled study. *BMC Public Health* **20**, 475 (2020). https://doi.org/10.1186/s12889-020-08594-9
12. Fiedler SA, Oberle D, Chudy M, Scheiblauer H, Henseler O, Halbauer J, Heiden M, Funk M. Effectiveness of blood donor screening by HIV, HCV, HBV-NAT assays, as well as HBsAg and anti-HBc immunoassays in Germany (2008-2015). Vox Sang. 2019 Jul;114(5):443-450. doi: 10.1111/vox.12770. Epub 2019 Apr 22. PMID: 31012114; PMCID: PMC6849742.