Blood safety in the COVID-19 era: Is there need for concern?

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Outline

• Introduction
• Assessing a pathogens impact on blood safety and supply
• Risk assessment
• Suggested mitigation measures
Introduction

• Coronavirus disease 2019 (COVID-19) is caused by a novel coronavirus- severe acute respiratory syndrome- coronavirus 2 (SARS-CoV2)
• Initially reported in Wuhan, China in December 2019
• Declared COVID-19 a pandemic on March 11th, 2020 by WHO.
• Kenya’s first case announced March 13th, in a returning traveler.
• Currently:
Transmission of SARS-CoV-2

• Primarily through respiratory droplets - directly through contact with an infected person or indirectly through fomites.  
  *Procedures with aerosol transmission

Should we be concerned about blood safety during a respiratory disease outbreak?

Ong SW et al. (March 2020) Air, surface environmental, and personal protective equipment contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) From a Symptomatic Patient
JAMA. Published online March 4, 2020. doi:10.1001/jama.2020.3227
ID Outbreaks and Blood Transfusion Services

• Provision of safe and adequate blood is integral to clinical service

<table>
<thead>
<tr>
<th>13. BLOOD PRODUCTS of HUMAN ORIGIN and PLASMA SUBSTITUTES</th>
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</thead>
<tbody>
<tr>
<td>13.1 Blood and Blood Components</td>
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<td>13.1.1 Plasma, fresh-frozen</td>
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<td>13.1.2 Platelets</td>
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<td>13.1.4 Whole blood</td>
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<td>13.2 Plasma-derived Medicines</td>
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<td>13.2.1 Human Immunoglobulins</td>
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<td>13.2.1.1 Anti-D immunoglobulin[^93]</td>
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<td>13.2.1.2 Anti-Hepatitis B immunoglobulin (HBIG)[^94]</td>
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<td>13.2.1.3 Anti-Rabies immunoglobulin[^95]</td>
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[^93]: Deferasirox oral form may be an alternative, depending on cost and availability.
[^94]: Paediatric strength not commercially available. For extemporaneous preparation using Hydroxyurea powder.
[^95]: Rhs (human monoclonal). Contains 1,500IU = 300 micrograms per 2mL vial when reconstituted.
[^96]: Use for sexual assault survivors and children born to Hepatitis B+ mother.
[^97]: Ig (Equine)
ID Outbreaks and Blood Transfusion Services

• Questions relevant to the COVID-19 pandemic and blood safety include donor susceptibility, viraemia and transfusion transmissibility
Assessment of impact of an infectious agent on a blood transfusion service

- ‘Is this a recognized human infection?’
- ‘Is this a zoonosis or is there zoonotic potential?’
- ‘Is the donor population susceptible?’
- ‘Is the infectious agent endemic OR, for zoonoses or vector-borne diseases, is the animal host or vector present?’
- ‘Are there routes by which donors may be exposed?’
- ‘Will exposed donors donate?’
- ‘Is there a risk to sufficiency rather than a risk of transmission?’
- ‘Are there existing effective donor selection or processing measures in place to identify such donors or remove or inactivate the infectious agent?’
Assessment of impact of an infectious agent on a blood transfusion service

Is SARS-CoV-2 a human pathogen?

Yes

The species Severe acute respiratory syndrome-related coronavirus: classifying 2019-nCoV and naming it SARS-CoV-2

Consensus Statement | Open Access | Published: 02 March 2020

The species Severe acute respiratory syndrome-related coronavirus: classifying 2019-nCoV and naming it SARS-CoV-2

Coronaviridae Study Group of the International Committee on Taxonomy of Viruses

Nature Microbiology 5, 536-544(2020) | Cite this article
Assessment of impact of an infectious agent on a blood transfusion service

Is SARS-CoV-2 a human pathogen?

- Over 2.4 million cases confirmed globally, with 163,000 deaths
- Locally - 296 cases, 14 deaths
Assessment of impact of an infectious agent on a blood transfusion service

Is the Kenyan blood donor population susceptible? YES
Assessment of impact of an infectious agent on a blood transfusion service

Is the Kenyan blood donor population susceptible?

- SARS-CoV-2 is a highly infectious disease
- emerging, no evidence of herd immunity
- no vaccine
- all ages
- some cases fit donor criteria
- nothing to suggest so far that the donor population is immune
Assessment of impact of an infectious agent on a blood transfusion service

Are there routes by which Kenyan blood donors may be exposed?

YES
Assessment of impact of an infectious agent on a blood transfusion service

Are there routes by which Kenyan blood donors may be exposed?

- Transmission by respiratory droplets, fomites
- Initial risk factor was travel
- Local transmission is rising
Assessment of impact of an infectious agent on a blood transfusion service

Will exposed donors donate? ➔ MAYBE
Assessment of impact of an infectious agent on a blood transfusion service

Will exposed donors donate?

✔ Donors are susceptible
  • Can an infected donor qualify to donate?
Will exposed donors donate blood?

• Donors are self-declared well

• With COVID-19, is there a time period where an individual may be infected but feeling well?


Emerging Infectious Diseases, 17 May 2020, 26(5):1052-1054
DOI: 10.3201/eid2605.200198 PMID: 32091386

Will exposed donors donate blood?

• With COVID-19, is there a time period where an individual may be viraemic but feeling well?

• 4 donations tested positive in Wuhan, 2 asymptomatic and 2 presymptomatic

• 7 donors tested positive in the Korean Red Cross Blood Services (KRCBS) after donation

Assessment of impact of an infectious agent on a blood transfusion service

Will exposed donors donate? YES
Assessment of impact of an infectious agent on a blood transfusion service

Are there existing effective donor selection or processing measures to identify donors or remove or inactivate SARS-COV-2 in this situation?
Are there existing effective donor selection or processing measures to identify donors or remove or inactivate SARS-COV-2 in this situation?

**Donor Specific**

- Donor recruitment
- No donor specific questions that assess risk of COVID-19
- Donor assessment e.g. temp check?

Are there existing effective donor selection or processing measures to identify donors or remove or inactivate SARS-COV-2 in this situation?

Agent Specific

• Current TTI screen: Not screening for SARS-CoV-2.
• Processing: e.g. component prep, leucoreduction, storage
• Pathogen reduction/inactivation technology

Assessment of impact of an infectious agent on a blood transfusion service

Are there existing effective donor selection or processing measures to identify donors or remove or inactivate SARS-CoV-2 in this situation?

NO

Potential risk to safety and/or sufficiency of donated products.
Full risk assessment is recommended
Risk assessment of SARS-CoV-2 to Blood Safety (and Supply*)

- Epidemiology, pathogenicity, transmission in general public, transfusion transmission/transmissibility
- Efficacy of donor & donation screening
- Steps to prevent, remove, inactivate pathogen
- Impact on recipients
Transfusion Transmission of SARS-CoV-2

- Identified/detected viraemia in donated blood and blood components.
- Detection of virus does not mean virus is infectious.
- No confirmed cases as yet.

- Transfusion transmission of SARS-CoV2 is considered a theoretical risk.
Risk assessment of SARS-CoV-2 to Blood Safety

- Epidemiology, pathogenicity, transmission in general public, transfusion transmission
- Efficacy of donor & donation screening
- Steps to prevent, remove, inactivate
- Transfusion transmissibility
- Impact on recipients
# COVID-19 and Blood Safety: Risk Assessment

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## COVID-19 and Blood Safety: Risk to Recipient

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Suggested measures to mitigate risk of COVID-19 to blood safety

Donor Recruitment

- Recruitment of VNRBD, convert replacement to VNRBD
- Recruit donors from ‘safe’ areas
Suggested measures to mitigate risk of COVID-19 to blood safety

Donor Selection

• Include in questionnaire prior to donation when making appointment
  - History of travel within the past 28 days
  - History of cough, fever, (COVID-19 case def)
  - History of contact with COVID-19 patient

• Donor health assessment should include a temperature check prior to entering blood collection venues.
Suggested measures to mitigate risk of COVID-19 to blood safety

Donor deferral

• 28 day deferral for prospective donors with history of travel outside the country
• Deferral of prospective donors with contact history of a confirmed or suspected case
• Donor with fever or respiratory symptoms
Suggested measures to mitigate risk of COVID-19 to blood safety

Blood collection

• Standard operating procedures apply
• Ideally divert first 20-50ml with skin plug
• With cough etiquette- disposable tourniquets or disinfect plastic tourniquets
Suggested measures to mitigate risk of COVID-19 to blood safety

Post-donation

• Encourage donors to report any symptoms 28 days post donation
• If symptoms reported- quarantine/recall product
• Check in with donors at day 14?
• Haemovigilance measures- cough and fever post transfusion?
COVID-19 and Blood Safety-2

• Blood insufficiency and impact on blood safety- through less than ideal donor selection.
• Reagent insufficiency and impact on blood safety
• Staff shortage
Acknowledgments