A Review of the Role of Clothing and Household Linens in the Spread of Community-based S. aureus (including MRSA) Infections

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Abstract

A review of the literature indicates that clothing and household linens play a significant role in the spread of infectious diseases in the home and everyday settings during normal activities. Sources of evidence included field studies, assessing microbial contamination on clothing, survivor surfaces, cross-contamination during laundering and outbreak studies. The data suggest that the greatest risks occur immediately after contact with, or shading from an infected source. Although the risks decrease as numbers of viable units decline, indicators are that pathogens can persist on the surfaces of fabrics from hours (viruses or Gram-negative bacteria), to days or weeks for desiccation-resistant strains such as S. aureus, C. difficile or fungal spores. Transmission via clothing and household linens may play a role in the spread of S. aureus (including MRSA) infections. Effective laundering is important in preventing the spread of S. aureus and MRSA in household/community settings. The potential routes of spread are illustrated in Figure 1 in which immediate transmission occurs when clothing and household linens which have been contaminated come into direct contact with a new target (e.g., skin, hands, cleaning utensils), together with supports of healthcare workers should be routinely laundered in a manner which renders them not only visibly but also hygienically clean. This information should be used to inform household laundry practice.

Introduction

Within the home, the control points of infection transmission include the hands, cleaning utensils, hand contact surfaces, clothing and household fabrics (Fig. 1). Evidence suggest that although the risks associated with clothing and household fabric is low as compared to other high frequency contact surfaces, it is still significant.

Clothing and household linens (sheets, pillows and towels) may be used as vehicle for infection spread, in homes and everyday settings. The potential routes of spread are shown in Fig 1. Additional points where clothing etc can spread infection are:

1. Where contaminated items come into direct contact with a new target (e.g., skin, hands, cleaning utensils), together with supports of healthcare workers should be routinely laundered in a manner which renders them not only visibly but also hygienically clean.

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Survival of Transfer of S. aureus on Clothing and Other Fabrics

- Case and control study of community-associated MRSA skin and soft tissue infection (SSTI) outbreaks in a college football team
- Case control study of MRSA and CA-MRSA In US prison
- Intervention study to manage outbreaks of S. aureus infection in a US county jail
- Case and carrier study of skin and soft tissue infections in a county jail

Evidence for Transmission via Clothing and Household Linens

- 10 published studies were identified where transmission via clothing and linen was identified as a likely cause, or was identified as a significant risk factor. These involved viral, bacterial and fungal infections, and included gastrointestinal infections (including MRSA) Infections. Effective laundering is important in preventing the spread of S. aureus and MRSA in household/community settings. The potential routes of spread are illustrated in Figure 1 in which immediate transmission occurs when clothing and household linens which have been contaminated come into direct contact with a new target (e.g., skin, hands, cleaning utensils), together with supports of healthcare workers should be routinely laundered in a manner which renders them not only visibly but also hygienically clean. This information should be used to inform household laundry practice.

Evidence for Transmission via Clothing and Household Linens


S. aureus and CA-MRSA on Clothing and Other Fabrics

Figure 2: Routes of Transmission of Infection Involving Clothing and Linens

- Risk for MRSA infection increased with lower frequency of hand washing can vary depending on the species and other factors such as RH but Gram positive spp.
- Intervention study to manage outbreaks of S. aureus infection in a US county jail
- Case and carrier study of skin and soft tissue infections in a county jail
- Case control study of MRSA and CA-MRSA In US prison
- Intervention study to manage outbreaks of S. aureus infection in a US county jail

Laundryercare Scars at Home

- UK study: 31% of nurses did not use the hospital laundry
- US survey of nursing staff indicated that 26% home-laundered their scrubs
- Clinical low temperature(<60C) quick wash cycles (<10mins) & lack of detergent can result in failure to eliminate MRSA and Acinetobacter baumannii from clothing and may also result in cross-contamination/colonization in the washing machine

Recommended Household Laundry Guidelines for Higher Risk Situations

- Wash at 60° C or higher. Use an oxygen bleach-based laundry product and following manufacturer’s instructions when:
- There is a community-based infection/shedding or immuno-compromised individual in the home
- Uniforms/overcoats of healthcare workers are laundered at home
- Clothing is heavily soiled e.g. with feces or vomit (including diaper changes)
- Wearing patients’ clothing, particularly for high-contact sports such as football, judo, wrestling etc.
- Wearing cloths and towels used in the kitchen during food preparation.

References

1. Mackintosh et al. An extended model for transfer of micro-organisms via the hands: differences between organisms and the mode of transmission.
3. Nguyen et al. 2006
5. Mackintosh et al. An extended model for transfer of micro-organisms via the hands: differences between organisms and the mode of transmission.
7. Mackintosh et al. An extended model for transfer of micro-organisms via the hands: differences between organisms and the mode of transmission.
9. Preventing the spread of infectious diseases in the European Union - targeted hygiene as a framework for sustainable Hygiene measures must themselves be sustainable, and the measures taken should be consistent with the needs of consumers. Home laundry is one of the interventions that may be used to prevent the spread of infectious diseases. The guidelines for home laundry are based on the current scientific evidence and are intended to provide practical recommendations for practicing caregivers.
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