Journal of Hospital Infection 86 (2014) 110–116

Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevierhealth.com/journals/jhin

Clinical glove use: healthcare workers' actions and perceptions

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ARTICLE INFO

Article history:
Received 2 June 2013
Accepted 4 November 2013
Available online 28 November 2013

Keywords:
Behaviour
Cross-contamination
Gloves
Hand hygiene
Healthcare workers

SUMMARY

Background: The incorrect use of clinical gloves and the failure to change them between procedures increases the risk of cross-transmission. Much attention has been focused on compliance with hand hygiene.

Aim: To investigate the use of gloves, their potential for cross-contamination, and factors that influence the decision of healthcare workers (HCWs) to wear them.

Methods: The use of gloves was observed in six wards in a single UK hospital trust. Risk of cross-contamination was defined as a violation of a 'moment of hand hygiene' during the glove-use episode. Twenty-five HCWs from the wards included in the observational audit were interviewed to identify the drivers for glove use.

Findings: A total of 163 glove-use episodes were observed over a period of 13 h. Glove use was inappropriate in 69 out of 163 (42%) episodes, with gloves commonly used inappropriately for low-risk procedures (34/37; 92%). In 60 out of 163 (37%) episodes of glove use there was a risk of cross-contamination, most (48%) being associated with failure to remove gloves or with performing hand hygiene after use. HCW interviews indicated that the decision to wear gloves was influenced by both socialization and emotion. Key emotions were disgust and fear. Assumptions that patients preferred gloves to be used, confusion about when to wear them, and social norms and peer pressure were also important influences.

Conclusion: Glove use is associated with risk of cross-contamination and should be more explicitly integrated into hand hygiene policy. An understanding of the drivers of glove-use behaviour is required to design interventions to reduce misuse and overuse.

Introduction

Healthcare-associated infections (HCAIs) are a considerable social and economic burden for patients, relatives and the health services, prolonging length of hospital stay, and increasing resistance to antimicrobial agents.[1] They affect more than 6% of patients in hospitals in the UK, acutely ill patients being at four-fold greater risk.[2] Hands are acknowledged to be a major vehicle of transmission of infection between patients and have been responsible for outbreaks of infection reported in the literature.[1] Frequent hand hygiene during the delivery of healthcare is strongly recommended as the primary infection prevention measure, with the risk of transmission of infection to patients being prevented by hand decontamination immediately prior to touching a patient and

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0195-6701/$ – see front matter
http://dx.doi.org/10.1016/j.jhin.2013.11.003

before contact with a susceptible site such as a wound or invasive device.[1,3] A methodology for prompting hand hygiene at critical points in the delivery of patient care has been adopted worldwide as the framework for infection prevention and control (IPC) education on hand hygiene.[1,4]

The introduction of universal precautions (UP), followed by the concept of body substance isolation, was an important development in IPC as it signalled the introduction of latex and vinyl gloves into routine clinical activity.[5–7] Subsequently national guidelines advised the use of gloves as part of standard IPC precautions to prevent exposure to blood and body fluids (BBF) based on a risk assessment.[3,8,9] Studies have tended to focus on compliance with glove use in relation to UP and isolation policy, and have identified as problematic the failure to remove or change gloves in a timely manner, as well as low rates of glove removal between procedures and patients during routine care.[10–12]

Guidance on glove use emphasizes the importance of changing gloves between procedures and patients and carrying out hand hygiene following their removal.[3] However, World Health Organization (WHO) guidance and observation tools do not explicitly integrate the use of gloves within the framework of 'My five moments of hand hygiene' (M5M).[1,4] Incorrect use of gloves, such as failure to change them between patients or between different sites on the same patient, combined with inadequate hand hygiene after use, is potentially hazardous and may result in the transmission of micro-organisms to the patient via gloved hands.

The small number of studies highlighting failures to remove or change gloves between patients or prior to aseptic procedures have been undertaken in the context of contact precautions, and have provided limited insight into the reasons for these failures.[10–12] The aims of this study were to determine the current context for the general use of gloves in an acute care setting, the extent to which their use is associated with compliance with M5M and risks of cross-transmission, and the factors that influence HCWs' decisions to wear gloves.

Methods

The study was conducted in two phases: an observational audit of how HCWs use clinical non-sterile gloves followed by qualitative semi-structured interviews with clinical staff. The observational audit was undertaken as part of an infection control audit in six wards in an acute, teaching National Health Service trust in the UK between October and December 2011. Wards were selected to provide a balance of surgical, medical and acute care specialties. The audit was conducted in 60–90 min observation periods, and was only conducted on episodes of care where clinical gloves were used. Observation commenced when HCWs were observed to be putting on gloves or were already wearing them and ceased when the gloves were removed. To maintain privacy and dignity, procedures undertaken behind curtains were inferred on the basis of the equipment used or by questioning the HCW on completion of the procedure. Prior to starting the audit, permission was sought from the nurse in charge of the ward but the specific purpose of the audit was not disclosed. To minimize the Hawthorne effect, observations were delayed for 15 min to allow ward staff to become familiar with the presence of the auditors.[13] An audit form was designed to capture the procedures performed and items that were touched while wearing gloves, and when gloves were removed and hands washed. Glove use was considered appropriate if the procedure involved: a risk of contact with BBF or mucous membranes; direct patient contact in an isolation bay or room during a defined outbreak of infection; or the use of hazardous substances, e.g. disinfectants. Procedures for which gloves were worn were classified as low, medium and high risk according to the Fulkerson scale.[14]

The M5M were adapted to assess the risk of cross-contamination in the context of the gloved hand (WHO). A 'moment' constituted the requirement to remove or change gloves as shown in Table I. Two trained observers conducted independent observations, which were compared for inter-rater reliability. Data were analysed using SPSS version 21 and Pearson's chi-squared test was used to assess the statistical significance of the variables affecting glove-use and the risk of cross-contamination.

Staff who volunteered to participate in the qualitative phase of the study were recruited from those wards included in the audit phase, and a purposive sample reflecting a mix of disciplines was obtained. The purpose of the interviews with HCWs was to elicit the drivers for glove use and triggers for their removal. To avoid any implicit or explicit coercion to participate, an independent researcher, who was not a member of the hospital IPC team, recruited and interviewed all participants. Written consent was obtained from all participants and confirmed at the beginning of each interview.

The interviews were semi-structured and focused on the participant's use of gloves at home and work, the decision-making process regarding donning and removing gloves, and on key influences on the decision. Interviews were digitally recorded and transcribed. A contextualist method of thematic analysis was selected, as the focus of the analysis was the socio-cultural context of the participants' decisions to wear gloves. Data were analysed by a researcher using a six-step thematic analysis process (see Table II).[15] The data were manually coded using an inductive, bottom-up, data-driven approach that avoids fitting the data to existing frameworks or preconceived categories. Themes were validated by a second researcher. Ethical approval was obtained from the University Research Ethics Committee, and the study was categorized as service improvement by the Trust's Research and Development Department.

Results

Glove audit

In total, 163 episodes of glove use were observed during a total of 13 h of audit on the six wards. Overall, 48.5% (79/163) of observations took place in intensive care unit (ICU)/high dependency unit (HDU) and 51.5% in general medical/surgical wards (Table III).

Overall glove use was appropriate on 42% (69/163) of occasions. In 33% of episodes the procedure was considered high risk for exposure to BBF, and in these cases glove use was recorded as appropriate. However, for 99% of the low-risk and for 84% of the medium-risk procedures, glove use was inappropriate. Inappropriate use was more likely in ICU/HDU than other wards, although the difference was not significant ($\chi^2 = 2.48$; $P = 0.115$) (Table III).