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Inter-professional differences in compliance with standard precautions in operating theatres: A multi-site, mixed methods study

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ABSTRACT

Background: Occupational acquisition of blood-borne infections has been reported following exposure to blood or body fluids. Consistent adherence to standard precautions will reduce the risk of infection.
Objectives: To identify: the frequency of self-reported adverse exposure to blood and body fluids among surgeons and scrub nurses during surgical procedures; contributory factors to such injuries; the extent of compliance with standard precautions; and factors influencing compliance with precautions.
Design: A multi-site mixed methods study incorporating a cross-sectional survey and interviews.
Settings: Six NHS trusts in Wales between January 2006 and August 2008.
Participants: Surgeons and scrub nurses and Senior Infection Control Nurses.
Methods: A postal survey to all surgeons and scrub nurses, who engaged in exposure prone procedures, followed by face to face interviews with surgeons and scrub nurses, and telephone interviews with Infection Control Nurses.
Results: Response rate was 51.47% (315/612). Most 219/315 (69.5%) respondents reported sustaining an inoculation injury in the last five years: 183/315 (58.1%) reported sharps' injuries and 40/315 (12.7%) splashes. Being a surgeon and believing injuries to be an occupational hazard were significantly associated with increased risk of sharps' injuries (adjusted odds ratio 1.73, 95% confidence interval 1.04–2.88 and adjusted odds ratio 2.0, 1.11–3.5, respectively). Compliance was incomplete: 31/315 (10%) respondents always complied with all available precautions, 1/315 (0.003%) claimed never to comply with any precautions; 64/293 (21.8%) always used safety devices, 141/310 (45.5%) eye protection, 72 (23.2%) double gloves, and 259/307 (84.4%) avoided passing sharps from hand to hand. Others selected precautions according to their own assessment of risk. Surgeons were less likely to adopt eye protection (adjusted odds ratio 0.28, 0.11–0.71) and to attend training sessions (odds ratio 0.111, 0.061–0.19). The professions viewed the risks associated with their roles differently, with nurses being more willing to follow protocols.
Conclusion: Inter-professional differences in experiencing adverse exposures must be addressed to improve safety and reduce infection risks. This requires new training initiatives to alter risk perception and promote compliance with policies and procedures.

What is already known about the topic?

- Surgeons and scrub nurses are at risk of percutaneous and mucocutaneous exposure to blood during exposure prone procedures.

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- Adhering to standard precautions for all patients whenever there is possible contact with blood or body fluids is reported reduces the risk of injury.
- Compliance with standard precautions is sub-optimal among all operating theatre personnel, particularly surgeons.

What this paper adds

- The risk of adverse exposure to blood and body fluids is higher amongst surgeons and those regarding inoculation injuries as an occupational hazard.
- Only 10% (31/315) of operating theatre personnel adopt standard precautions consistently. Adoption is determined by practitioners' ad hoc risk assessments.
- Surgeons and scrub nurses perceive the risk of infection with BBVs differently, with surgeons admitting that they consider sharps' injuries to be an occupational hazard.
- Education and training sessions are poorly attended, and therefore have minimal impact on altering risk perception and improving compliance.

1. Introduction

Healthcare professionals risk occupational acquisition of blood-borne viral (BBV) infection during exposure prone procedures due to percutaneous and mucocutaneous exposure to blood and body fluids. Most exposure prone procedures are undertaken in the operating theatre. Therefore theatre personnel are continually at risk of acquiring BBV infection during these procedures due to frequent contact with blood, extensive use of sharp instruments and the intricacy of the procedures (Jagger et al., 2010). Guidelines have been developed to protect healthcare professionals (Centers for Disease Control and Prevention (CDC), 1987; Siegel et al., 2007; UK Health Departments, 1998).

2. Background

From the latest figures available, it is estimated that the risk of contracting HIV following percutaneous exposure to infected blood is around 0.3% (CDC, 1996; UK Health Departments, 1998). The risk of hepatitis C virus (HCV) transmission via this route is approximately 3%, while for Hepatitis B virus (HBV) the risk is thought to be in the order of 30% for non-vaccinated personnel (UK Health Departments, 1998). The risk of infection via mucous membrane exposure is lower, at approximately 0.03% for HIV (Public Health Laboratory Service (PHLS), 1999). However, mucocutaneous exposure is thought to occur more frequently than percutaneous exposure, therefore the cumulative effect could result in a higher risk of infection (UK Health Departments, 1998). Sharps' injuries alone may result in approximately 66,000 cases of HBV, 16,000 cases of HCV, and 200–5000 cases of HIV annually in healthcare workers worldwide. This estimate is based on: the average numbers of healthcare workers at risk; the average numbers of sharps' injuries each year; the prevalence of infection in patients and the patient population, HBV vaccine update rates and post exposure prophylaxis take up rates (Prüss-Üstün et al., 2003).

Appropriate action following inoculation injury, including first aid, prophylactic treatment and surveillance, can significantly reduce the risk of occupational acquisition of HIV and HBV infection (Department of Health, 2008). However, prevention is better than cure and universal precautions (CDC, 1987), and more recently standard precautions (Garner et al., 1996; Siegel et al., 2007) and operating theatre specific precautions (UK Health Departments, 1998), are recommended to reduce the risk of occupational acquisition of BBV during surgery. These include the appropriate use of face protection, double gloving, passing sharps through a neutral field and use of safety devices irrespective of the BBV status of the patient. Adoption of all precautions for all patients is supported by data from the Health Protection Agency (HPA, 2010) indicating that there were approximately 86,500 people living with Human Immunodeficiency Virus (HIV) in the UK at the end of 2008, 25% of whom were unaware of their diagnosis. In addition, 185,000 people are currently chronically infected with HCV in England and Wales (HPA, 2009) and 75% of hepatitis C (HCV) positive individuals in Wales are thought to be unaware of their diagnosis (Welsh Assembly Government (WAG), 2009).

Of the accidents reported in UK operating theatres between 2000 and 2007, 20% were preventable with proper use of precautions and safe disposal of clinical waste (HPA, 2008), yet compliance is poor (Cutter and Jordan, 2004; Raghavendran et al., 2006; Tarantola et al., 2006). Legislation to reduce injuries has had mixed results. In the USA, while injury rates fell in non surgical specialities following the introduction of the Needlestick Safety and Prevention Act of 2000, sharps' injuries in surgery continued to increase (Jagger et al., 2010). Changing behaviour is undoubtedly complex as it relies on identifying attitudes, life experiences, beliefs, perceived health threat, self-efficacy, attitude, intention, communication, and participation (Cooper, 2007; Elliott, 2009; Kretzer and Larson, 1998) and incorporating these into interventions that will affect it in a positive way.

The theory of planned behaviour (TPB), developed from the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980), may be a useful tool for understanding the determinants of staff's actions. According to the TPB, intention is the product of three factors: attitude towards the behaviour, social influence or subjective norm and issues of control i.e. perceived behavioural control (Ajzen, 2005). Understanding the motivation behind behaviour is the first step towards initiating change (Ajzen and Fishbein, 1980; Pittet, 2004). The TPB has been used to identify factors influencing the intention to comply with infection control interventions (Godin et al., 1998; Jenner et al., 2002) and it is possible that it could be utilised to identify where efforts need to be concentrated to improve compliance with standard precautions.

Accordingly, through identifying factors influencing behaviour, this study aimed to develop strategies whereby compliance with available precautions could be improved and the risk of injury reduced. This entailed identifying associations with and frequency of: