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Preliminary inquiry: Adherence to universal precaution methods among healthcare providers in a government hospital in Odisha, India

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Abstract

Background Risk of infections associated with health care facilities have long been known. However, occupationally-acquired infections are still a significant problem for health care personnel (HCP). The aim of this study was to make a situational assessment of universal precaution (UP) adoption and to identify factors influencing compliance.

Methods A hospital based cross-sectional study was conducted among 32 of 39 HCPs working in a sub-district hospital (SDH) at Nilgiri, Balasore Odisha. A validated questionnaire was used to collect data on knowledge and practice, while a check list was used for observation of factors influencing compliance.

Results Over 90% of the study participants answered correctly on 12 of the 19 questions concerning knowledge and understanding of UPs, while questions regarding practice scored significant lower with 5 of 19 ($p = 0.049$). Prevalence of practices such as the use of protective glasses, surgical masks and use of gloves was found to be 38%, 31% and 50% respectively. Facility assessment and observations identified a lack of protective measures such as gloves in the laboratory and dressing rooms, chlorine or any other chemical disinfectants and a proper place for waste disposal as well as a lack of training in safety precautions.

Conclusion The knowledge, practice and attitudes of using UP were very low in this study, thus indicating a major need of interventions to improve UP compliance.

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Introduction

Despite advancements in technology and health care safety, occupationally acquired infections remain a challenge for health care workers. According to the World Health Organization estimates, nearly three million people worldwide are exposed to percutaneous and mucocutaneous accidents every year, which could result in diseases such as Hepatitis B, C and HIV. 90% of reported cases occur in developing countries (1). The risk of occupational exposure to blood borne diseases is an alarming and real threat for all HCP. As the number of people infected with blood borne diseases increases, it has become critical that all HCP exhibits unfailing compliance with a strategy for isolation precautions, known as UPs (2). The obligatory behaviours incorporated with the practice of UPs must be used by all HCP, whose work practices involve contact with patients' body fluids (2). Few studies have documented the compliance of HCP to UPs in public hospital settings in India (3-5). The aim of this

study was, for the first time, to make a situational assessment of universal precaution adoption in a SDH of Odisha State in India and to identify factors influencing compliance. SDHs are concerned with secondary care provision, which necessitates adherence to prescribed infection control measures both for patients as well as health care providers.

Methods

This hospital-based cross-sectional study is a preliminary inquiry, carried out in a SDH at Nilgiri, Odisha between April and June 2012.

The study was conducted among 32 of 39 HCP. A validated questionnaire was used to collect data on knowledge and practice, while a check list was used for observation of factors influencing compliance.

Setting

SDHs are organised below the district level and above the community health centres (block level hospitals). They act



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as first referral units for the population in their geographical areas and offer secondary care services. They also provide specialist services in emergency obstetrics and neonatal care, general surgery, general medicine and pediatrics, with one major and one minor operation theatre as well as one laboratory. SDHs receive referred cases from neighbouring community health centres, primary health centres and sub-centres. A SDH caters to about 500,000-600,000 people. The study was carried out in the only SDH in the Balasore district, catering to the tribal blocks of Balasore and the adjacent Mayurbhanj district.

Participants

In total, there were 39 HCPs in the SDH, comprising 10 doctors, 14 nurses, 2 pharmacists, 3 laboratory technicians and 10 attendants. For the study, it was decided to include all of the HCPs, as all of them were involved in in-patient care and delivered different types of health-care encompassing emergency, indoor and out-patient services. Informed consent was obtained before the interviews; all the participations were voluntary and confidential in nature.

Data collection

Information on UP was collected through a semi-structured questionnaire on knowledge, attitude, practice and barriers; an infrastructure- and a direct observation of procedures was registered by using a check list.

The semi-structured questionnaire for interviewing of HCPs was developed by adopting the theme questionnaire of study conducted by Michelle Kermode et al (4). The questionnaire was validated through a pilot study. It included 19 questions on knowledge about UPs (Table 1), such as whether cut with a used scalpel spreads infection and if needle stick injuries can spread blood borne viruses (such as HIV/AIDS and hepatitis)? Additional 19 questions on practices were addressed to identify the participants' practice behaviours (Table 2), such as whether the participants take extra care when using scalpels, needles, razors or other sharp objects and if they dispose of all blood-contaminated items by using the designated bag or bucket for disposal?

Facility assessment was made with the help of a checklist adopted from Universal Precautions Guidelines for Primary Health Care Centers in Indonesia (6).

This study was approved by Institutional Ethical Committee of Indian Institute of Public Health, Bhubaneswar.

Table 1 Knowledge and Understanding of Universal Precaution

Items	Respondents answered "Yes" (n=32)	
	%	(95% CI)
Re-using needles and syringes in hospitals can spread blood borne viruses	100.0	(91.06-100)
A cut with a used scalpel blade can spread blood borne viruses	100.0	(91.06-100)
Hands should be washed every time after and before examining the patient/ any procedure	100.0	(91.06-100)
A single pair of gloves should be used to examine multiple peoples	100.0	(91.06-100)
Gloves should be worn for all procedures that may involve contact with blood or body fluids	100.0	(91.06-100)
UPs are an effective way to protect doctors, nurses and other health workers from infection with blood borne viruses such as HIV/AIDS	100.0	(91.06-100)
Blood and body fluids of all patients should be treated as infectious, as per UPs	96.9	(85.54-99.84)
Re-using razors can spread blood borne viruses	96.9	(85.54-99.84)
A mask should be worn for all procedures where blood and body fluids may splash	93.8	(80.85-98.94)
Needle stick injuries can spread blood borne viruses (such as HIV/AIDS and hepatitis)	93.8	(80.85-98.94)
Blood /body fluids that has spilled on the ground (eg. in labour room, OT) should be cleaned up immediately	93.8	(80.85-98.94)
Eye protection should be worn for all procedures where blood and body fluids may splash	90.6	(76.57-97.56)
I have a good understanding of how to apply UPs in my work	78.1	(61.45-89.9)
Amniotic fluid (liquor) splashing in the eyes or mouth can spread blood borne viruses	68.8	(51.33-82.91)
Blood splashing in the eyes or mouth can spread blood borne viruses	62.5	(44.97-77.85)
Used needles should not be recapped	59.4	(41.9-75.22)
Blood on unbroken skin can spread blood borne viruses	40.6	(24.78-58.1)
Knowledge about protecting from blood borne infections (such as HIV/AIDS and hepatitis B) at work	75.0	(58-87.66)
There is need of precaution against exposure to blood only if the patient has an infectious diseases such as HIV/AIDS	28.1	(14.67-45.38)



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Analyses

The responses were presented as % yes answers of participating HCPs, including the 95% Confidence Interval (CI). The response was considered correct for the whole group of HCPs if more than 90% had answered correctly. The difference between the number of correct answers were compared for knowledge/understanding and practice by Fisher's exact test. A p-value below 0.05 was considered significant.

Results

In total, 39 health workers were approached, out of which seven refused to participate due to time constraints thus resulting in 32 study participants and a response rate of 82%.

Over 90% of the study participants answered correctly on 12 of the 19 questions concerning knowledge and understanding of UP (Table 1), while practice was significantly lower; 5 of 19, $p = 0.049$ (Table 2).

Very low knowledge and understanding was observed among HCPs, who believed that precaution measures should be taken only when treating patients diagnosed with HIV/AIDS (28%). Another area of little knowledge and understanding included the risks of spreading blood borne diseases on unbroken skin (41%) (Table 1).

Prevalence of practices such as use of protective glasses, surgical masks and use of gloves was found to be low; 38%, 31% and 50% respectively (Table 2). Most of the participants expressed difficulties in adopting precautions because they felt that they were too busy, lacked adequate training or experienced discomfort using personal protective equipment (Table 2). Interestingly, there seemed to be an internal discrepancy among the responses on the different practice questions, since 91% answered that they used protection against blood and body fluids, regardless of the patient's diagnosis, but at the same time 72% answered that they were too busy to follow the recommended precautionary steps against contact with patients' blood and body fluids. However, the number of participants was too small to allow more detailed analyses on this.

Furthermore, the facility assessment and observations identified lack of gloves in the laboratory as well as in the dressing rooms; clean towels, chlorine, ethanol and other chemical disinfectants; a proper place for waste disposal and training on safety precautions. An interesting observation was that infected material was not made unavailable, even in areas with access for all hospital staff and therefore constituted a potential risk of exposure to staff members.

Table 2: Practice of precautionary measures

Item	Respondents answered "Yes" (n=32)	
	%	(95% CI)
Taking extra care when using scalpels, needles, razors or other sharps objects	100.0	(91.06-100)
Disposing of all blood-contaminated items into the designated bag or bucket for disposal	96.9	(85.54-99.84)
Washing my hands after removing disposable gloves	93.8	(80.85-98.94)
Putting used needles and other sharp objects into the designated sharps container	93.8	(80.85-98.94)
Protecting against the blood and body fluids of all patients, regardless of their diagnosis	90.6	(76.57-97.56)
Covering any broken skin before coming to work	81.3	(65.02-92.03)
Wiping up all spills of blood and other body fluids promptly	75.0	(57.99-87.66)
Too busy to follow the recommended precautionary steps to protect against contact with patients' blood/body fluid	72.0	(54.62-83.33)
In emergency situations it is not possible to follow the protective guidelines against contact with patients' blood/body fluid because the patients' needs come first	59.4	(41.9-75.22)
Recapping needles that have been contaminated with blood	56.25	(38.89-72.52)
Using recommended precautionary steps to protect against contact with patients' blood, may offend /emotionally hit the patient.	53.1	(35.95-69.76)
Wearing gloves whenever there is a possibility of exposure to blood or other body fluids	50.0	(33.06-66.94)
Wearing a waterproof apron whenever there is a possibility of blood or other body fluids splashing on clothes	46.9	(30.24-64.05)
Wearing eye protection (glasses) whenever there is a possibility of blood or other body fluids splashing on face	37.5	(22.15-55.08)
Training status for correct use of protective equipment (eye wear, gloves, masks)	37.5	(22.15-55.08)
Wearing of protective equipment (eye wear, gloves, masks) is very uncomfortable in this working condition	37.5	(22.15-55.08)
Wearing protective equipment (eye wear, gloves, masks) makes it difficult to do the job properly	34.4	(19.58-51.88)
In this hospital it is not essential for staff to protect themselves against contact with patients' blood because the patients are from tribal area, so risk of infection with blood borne viruses such as HIV/AIDS is minor	3.1	(0.15-14.46)
Wearing a surgical mask whenever there is a possibility of blood or other body fluids splashing in my face	31.3	(17.09-48.67)



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Discussion

Overall, the high prevalence of shortcomings in knowledge, practice and attitudes towards precaution measurement assessed in this study revealed that most of the HCPs put themselves (and as a result, their patients) at risk of getting infected with blood-borne diseases. Due to the fact that all blood and body fluids are potentially contaminated with infectious diseases, it is presumed that all hospital patients, regardless of their blood-borne infection status, represent a potential source of infection.

The lack of appropriate knowledge, practice and facilities has been documented in other studies from developing countries, including India (3, 4, 7). These problems can be explained by the absence of training and follow-up procedures as well as traditions and cultures unintentionally promoting infections instead of preventing and controlling them. Perceived barriers to compliance with UPs clearly influence HCPs' ability and willingness to comply with them in practice. Only about half of the study participants reported to use protective measures such as gloves and water proof aprons. "Improper training", "uncomfortable" and "difficulty in working" were cited to be reasons behind it. Similar factors have also been reported in other studies (8, 9). This could be due to low level of training received by the HCPs and the low availability of equipment, as shown in some studies (10). One of the weaknesses of this study is the low number of participants along with time and resource constraints. However, the results were relatively clear, and it is not probable that the outcomes of a larger study population would have been different. Nonetheless, a larger study population would have allowed an evaluation of the internal discrepancy in the answers. Another weakness is that this work was confined to a single health care facility, which means that the results may not be extrapolated to other settings.

Absence of equipment for sterilization and lack of a sterilization area, as observed during the study, aggravates the compliance of UPs. In order to improve the practice, it seems to be important to have a comprehensive policy and strategy. An integrated approach for promoting positive perception of UP compliance should consider training for all staff including the managers as well as monitoring the follow-up results over time, adequate supply of personal protective equipment, securing facilities for sterilisation and encouraging HCPs to avail the services as well as working towards improving the traditions and culture.

To conclude, the knowledge, practice and attitudes of using UP were very low in this study, thus indicating a major need of interventions to improve UP compliance.

Contribution details

Dr S. Pati carried out the design and coordinated the study. Dr S. Parida provided assistance in the design of the study, coordinated and carried out all the experiments and participated in manuscript preparation. Dr Akhtar and Mr Swain provided assistance for all experiments in analysis and drafting the paper. All authors have read and approved the content of the manuscript.

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Competing interests:

None declared.

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