A STUDY TO ASCERTAIN THE ADEQUACY OF OBSERVANCE OF UNIVERSAL PRECAUTIONS IN ACUTE MEDICAL AND SURGICAL WARDS OF A LARGE TEACHING HOSPITAL

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ABSTRACT

The present study was a cross-sectional analytic epidemiological design to assess the frequency of observance of universal precautions in acute care wards of a large teaching hospital and to assess the epidemiological determinants of such observance. A total population of medical officers, nurses, paramedical and ancillary workers working in acute medical and surgical wards was studied using direct observations recorded on a pre-tested, structured format. The study revealed that handwashing was more frequently practiced by medical officers and ancillary staff (68% to 93%) as compared to nurses and paramedicals (38% to 58%) ($p < 0.01$). Significantly higher proportion of medical officers in medical wards (93%) and nurses (63.3%) and ancillary workers in surgical ward (89%) were practicing handwashing ($p < 0.01$). The practice of usage of gloves was significantly more frequent among medical officers and ancillary workers (72% to 100%) while it was quite inadequate among nurses and paramedicals (28% to 36%), ($p < 0.001$). However, use of gloves was significantly better among nurses in surgical ward and paramedicals in medical ward ($p < 0.05$). A linear trend analysis of the use of protective clothing revealed that the odds of nurses adequately using the same were much lower while those of ancillary workers were much higher as compared to medical officers, the trend being highly significant in both the type of wards ($p < 0.001$). The study reveals a definite need of stepping up educational and motivational methods for observance of universal precautions by health care workers in large teaching hospitals. In particular, nurses and paramedical workers have been identified as high risk groups, needing concerted efforts for observing these precautions.

MJAFI 1998; 54 : 115-118

KEYWORDS : Barrier Devices; Health Care Workers; Universal precautions.

Introduction

In August 1987, Centres for Disease Control and Prevention (CDC) published a document titled, "Recommendations for Prevention of Human Immuno-Deficiency Virus (HIV) transmission" in health care settings [1]. In contrast to 1983 document, the 1987 document recommended that the blood and body fluids precautions be consistently used for all patients regardless of their blood borne infection status. This extension of blood and body fluid precautions to all patients is referred to as, "Universal Blood and Body Fluid Precautions" or "Universal Precautions" [2]. Universal Precautions are intended to prevent parenteral, mucous membrane and non-intact skin exposure of health care workers to blood borne pathogens [3].

Health workers associated with patient care in acute and emergency settings run the increased risk of blood and body fluid exposure since the infection status of the patients is usually unknown [4].

Studies designed to assess, health care workers po-

tential exposure at work place to blood and body fluid or on observance of Universal Precautions are limited in literature [5]. No study reference is available in Armed Forces Medical Services on these issues, though some guidelines were issued by the Office of Directorate General Armed Forces Medical Services in 1992. A study therefore was planned at acute medical and surgical wards of a large teaching hospital.

Material and Methods

The large teaching hospital (1052 bedded) providing tertiary level care was selected for the study. Acute medical (60 beds) and surgical (42 beds) wards look after various types of medical and surgical cases/emergencies. Average number of patients in acute medical ward were 54, inclusive of 3 HIV and 2 HBV positive cases as compared to 32 in acute surgical ward. Average number of health care workers who came in contact with cases in acute medical and surgical wards, were 21 and 26 respectively.

Frequency of use of barrier devices, i.e. gloves, masks, gowns and hand washing by all categories of health care workers was observed. Discrete observation of different groups of health care workers was made on each day in the peak hours of activities i.e. 0500 h - 0630 h in acute medical ward and 0930 h - 1130 h in acute surgical ward and minimum 10 observations from each

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group were made. Observation time ranged from 2 minutes to 10 minutes (e.g. withdrawal of blood and pleural tap).

A format was designed to collect data of each episode of likely exposure with blood and body fluids such exposure was counted as one "occurrence". Direct observations were made for each occurrence of adherence/non-adherence (yes/no) of "Universal Precautions" and recorded on the data sheet. Schedule of days of observation were selected at random.

Observations were analysed by means of working out percentages, calculated, by dividing frequency of use of barrier devices by total number of occurrences of likely exposure with blood and body fluids, separately for each group of health care workers, and comparison of proportions between the 2 types of acute wards was undertaken by simple chi-square test. In addition, significance of difference between the ordinal categories (Medical Officer, Nursing Officer, Nursing Cadet, Nursing Assistant and safai worker) was undertaken by chi-square for linear trend.

Results

(a) Practice of hand washing

Handwashing rate was found to be 93 per cent amongst medical officers while performing various procedures (Table 1). The practice was much lower amongst nursing cadets (38%) and nursing assistants (39%). The difference was statistically highly sig-

nificant ($P < 0.001$).

(b) Use of gloves

The practice of use of gloves among medical officers and nursing cadets did not show any significant difference (Table 2). It was observed that in acute surgical ward the rate of use of glove by medical officers was less (75%) as compared to acute medical ward (100%). In nursing officers category the difference in practice of use of gloves was highly significant between 2 wards ($p < 0.001$). Amongst other categories of health care workers i.e. nursing assistant and safaiwala the difference in practice of use of gloves was significant. The rate of glove use (72%) in nursing assistant category was higher in acute medical ward while in safaiwala category the rate was higher in acute surgical ward (95%).

(c) Usage of protective clothing

The compliance in use of protective clothing before performing a procedure, where likelihood of potential exposure to blood or body fluid existed, was found to be inadequate, by all categories of health care workers. Table 3 shows, significant difference in practice in use of protective clothing amongst medical officers and safaiwala categories of health care workers in 2 acute care wards. No significant difference was found in the other 3 categories of health care workers i.e. nursing cadets, nursing officers and nursing assistants. Rates of use of protective clothing was higher in

TABLE 1

Comparison of practice of hand washing between two acute care wards

Exposure rate	Category of HCW	AMW n=794	ASW n=447	P value	Significance
Frequency	Med Offr	28/30 (93)	63/101 (62.7)	0.002	S
No of episodes of	Nur Offr	287/498 (58)	71/131 (54.1)	0.52	NS
Hand washing/	Nur Cadet	58/154 (38)	45/71 (63.3)	0.001	S
No. of HW	Nur Asst	15/38 (39)	40/89 (44.9)	0.05	NS
Opportunities (%)	Safaiwala	50/74 (68)	49/55 (89)	0.001	S

NS = Not significant $p > 0.05$, S = Significant $P < 0.05$, HW = Hand washing; (Figures in parentheses indicate percentage)

TABLE 2

Use of gloves by health care workers in acute medical and surgical wards

Exposure rate	Category of HCW	AMW n=367	ASW n=323	P value	Significance
Total No of	Medical Officer	16/16 (100)	25/33 (75)	0.041	NS
episodes of	Nur Officer	86/249 (35)	98/158 (62)	0.001	S
use of gloves/	Nur Cadet	14/48 (29)	5/18 (28)	0.04	NS
Total No of	Nur Asst	13/18 (72)	26/72 (36)	0.012	S
opportunities (%)	Safaiwala	28/36 (78)	40/42 (95)	0.003	S

NS = Not significant $p > 0.05$, S = Significant $p < 0.05$; (Figure in parentheses indicate percentage)

TABLE 3

Comparison of use of protective clothing in acute medical and surgical wards

Exposure rate	Category of HCW	AMW n=396	ASW n=304	P value	Significance
Total no of	Med Officer	10/22 (45)	22/145 (15)	0.002	S
episodes of use	Nur Officer	72/248 (29)	1/9 (11)	0.27	NS
of protect cloth/	Nur Cadet	26/67 (39)	2/16 (13)	0.08	NS
Total No of	Nur Asst	5/22 (23)	15/48 (31)	0.65	NS
opportunities (%)	Safaiwala	28/37 (75)	31/86 (36)	0.001	S

NS = Not significant $p > 0.05$, S = Significant $p < 0.05$; (Figure in parentheses indicate percentage)

acute medical ward for both categories of workers i.e. medical officers (45%) and safaiwala (75%) as compared to acute surgical ward in which it was 15 per cent and 36 per cent respectively.

Stratum Odds Ratio (Table 4) showed that safaiwalas used protective clothing 4 times more often than medical officers, 6 times more often than nursing officers and 5 times more often than other groups of health care workers in acute medical ward. Whereas, Stratum Odds Ratio (Table 5) revealed that safaiwalas (acute surgical ward) used protective clothing 3 times more often than medical officers and about 4 times more often than nursing officers and nursing cadets.

TABLE 4

Distribution of use of protective clothing in acute medical ward by different groups of HCWs

Category of staff	Yes	No	Total (n=396)	Stratum OR
Med Offr	10 (45) *	2 (55)	22 (100)	1.00
Nur Offr	72 (29)	176 (71)	248 (100)	0.64
Nur cadet	26 (39)	41 (61)	67 (100)	0.76
Nur Asst	5 (23)	17 (77)	22 (100)	0.73
Safaiwala	28 (75)	9 (25)	37 (100)	3.73

*Figures in parentheses indicate percentage; Linear trend $\chi^2 = 9.937$, $df = 1$, $p < 0.001$ (highly significant)

TABLE 5

Distribution of use of protective clothing in acute surgical ward by different groups of HCWs

Category of staff	Yes	No	Total (n=304)	Stratum OR
Med Offr	22 (15)	123 (85)	145 (100)	1.00
Nur Offr	1 (11)	8 (89)	9 (100)	0.70
Nur Cadet	2 (13)	14 (87)	16 (100)	0.80
Nur Asst	15 (31)	33 (69)	48 (100)	2.51
Safaiwala	31 (36)	55 (64)	86 (100)	3.15

*Figures in parentheses indicate percentage; Linear trend $\chi^2 = 14.755$, $df = 1$, $p < 0.001$ (highly significant)

Discussion

Keeping in view the inadequacy of hand washing practices as observed in this study, nursing cadets and nursing assistants, therefore, seem to be the target group for directing educational and motivational efforts, as regards hand-washing practice. The low degree of usage of gloves by both medical officers as well as nursing cadets could be due to the fact that both categories of health care workers were less involved in tasks requiring maximum use of gloves like withdrawal of blood samples as observed in this study.

The high rate of use of gloves (100%) could be due to, the fact that, HIV/AIDS patients are admitted to acute medical ward. In both acute care wards, it was observed that health care workers were adhering to observance of Universal Precautions. The high rate (95%) of use of gloves by safaiwalas in acute surgical ward could be because they handle visibly infected and blood-soaked dressing while nursing assistants in

acute medical ward are involved in direct care of HIV/AIDS patients.

The difference in use of protective clothing (Table 3) can be explained by the fact that medical officers and safaiwalas were involved in procedures/disposal of waste, where direct likelihood of exposure to blood and body fluids is high. The high level of use of protective clothing by the various health care workers in the acute medical ward is due to the fact that AIDS/HIV cases are admitted to acute medical ward and not to acute surgical ward. In addition, the better usage of protective clothing in acute medical wards could also be due to the fact that availability of masks and gowns was better in acute medical ward as compared to acute surgical ward.

However, non-availability of sharp containers, eyeshields and shortage of masks, gowns and gloves were noticed in both the wards. The wards did not have any written Standing Operative Procedures (SOP) or guidelines for continuous training of health care workers for imparting knowledge about practice of 'Universal Precautions'.

The important findings which emerges from the present study is that the use of protective barriers as well as hand washing is quite low among nursing officers, nursing cadets and nursing assistants while it is fairly high among medical officers and quite high among safaiwalas. This needs to be viewed against the backdrop that it is mainly the nursing personnel who come in maximum contact with the patients. Low observance of universal precautions among such category of personnel is certainly a matter of concern and calls for intensive educational and administrative measures.

Lack of awareness of health care workers about applicability of universal precautions, accidental exposure and ignorance leading to negligence, is an area in which deficiency can be minimised by effective administration. The present study has highlighted that there is inadequate availability of barrier devices, and significant differences in practice of universal precautions among various categories of health care workers.

Barrier devices required for isolation precautions may be provided by means of isolation carts, placed in the patient care areas [5]. They are to be stocked with gloves, masks, gowns and eyeshields. These carts, one per ward, have to be restocked daily. Each nursing station should have a puncture resistant, leak-proof needle disposal unit/sharp container of 5 L size. Signboards, announcing the policy of universal precautions, have to be displayed strategically, in the nursing

station of each ward.

An interventional programme directed at the target group i.e., nursing assistants, nursing cadets and nursing officers to educate on observance of universal precautions be initiated without any delay. Furthermore, such a programme should commence right from the time of induction of these health care workers in the patient care areas, in order to have optimum adherence to universal precautions.

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