Infection
Hand washing,
Nosocomial infections,
Published online 30
Accepted 22
Punjab Medical College,
controlling the transmission of infectious diseases.
( be significantly decreased by hand
now extensively believed that hospital acquired infections can
nosocomial infections between patients. In view of this it is
care workers (HCWs) decreases the risk of communicating

tremendously decreases the risk of communication of
pamphlets have been associated with transitory advancement
al
The adherence of the medical professionals to hand washing
constantly achieved in daily life
In spite of the developments in infection control results are not
In spite of the developments in infection control results are not
The most important factor in controlling the nosocomial
importance of the use of antiseptics in preventing and controlling the nosocomial infections. Hand
washing is the most important factor in controlling the transmission of nosocomial infections by
bacteria, viruses and pathogens. Most of the health care professionals do not wash their hands before
and after contact with the patients. This study was performed to improve the quality of life by
providing knowledge about the control of nosocomial infections. Tertiary health care facilities were
examined and it was found that there was a deficiency in the knowledge regarding the hand washing
and its role in the prevention of nosocomial infections.

NOSOCOMIAL INFECTIONS PREVENTED BY ANTISEPTIC HAND WASHING AND EDUCATION

*Attiq ur Rehman and Wafa Majeed
Punjab Medical College, Allied Hospital, Faisalabad

ARTICLE INFO
Article History:
Received 16th January, 2017
Received in revised form
18th February, 2017
Accepted 22nd March, 2017
Published online 30th April, 2017

Key words:
Nosocomial infections,
Hand washing,
Infection control, Antiseptics.

ABSTRACT
Nosocomial infections are the hospital acquired infections caused by the pathogenic microorganisms
such as bacteria, fungi, viruses and parasites. The purpose of this study was to demonstrate the
importance of the use of antiseptics in preventing and controlling the nosocomial infections. Hand
washing is the most important factor in controlling the transmission of nosocomial infections by
bacteria, viruses and pathogens. Most of the health care professionals do not wash their hands before
and after contact with the patients. This study was performed to improve the quality of life by
providing knowledge about the control of nosocomial infections. Tertiary health care facilities were
examined and it was found that there was a deficiency in the knowledge regarding the hand washing
and its role in the prevention of nosocomial infections.

INTRODUCTION
The most important factor in controlling the nosocomial infections is hand hygiene (Semmelweis, 1988; Rotter, 1997).
In spite of the developments in infection control results are not
constantly achieved in daily life (Jarvis, 1994; Rotter, 1998).
The adherence of the medical professionals to hand washing
and sanitation is considerably less than the prescribed values.
(Jarvis, 1994; Donowitz, 1987; Simmons et al., 1990; Tibballs,
1996; Lowbury et al., 1964; Rotter and Koller, 1991; Teare et
al., 2001). Professional education, speeches, lectures and
pamphlets have been associated with transitory advancement
(Jarvis, 1994; Simmons et al., 1990; Lund et al., 1994; Albert
of the hospital infections are caused by the transient flora
which can be easily removed by the hand washing (Albert and
tremendously decreases the risk of communication of
nosocomial infections. By regularly cleaning the hands health
care workers (HCWs) decreases the risk of communicating
nosocomial infections between patients. In view of this it is
now extensively believed that hospital acquired infections can
be significantly decreased by hand washing and hygiene
(Quraishi et al., 1984). Health care experts have strongly
encouraged the hand hygiene as the excellent measure in
controlling the transmission of infectious diseases.

*Corresponding author: Attiq ur Rehman,
Punjab Medical College, Allied Hospital, Faisalabad

Participants, methods and study Plan
Setting
Hand washing and hygiene study was conducted in tertiary
care teaching facility from August 2016 to December 2016 in
Medical ICU and Surgical ICU.

Study Plan
Baseline data was obtained without any interference in the
control period. Study plan was observational and prospective.
It was followed by an education intervention scheme
sanitization and hand washing. Due to the more number of
patients and extended stay of the patients in Medical ICU there
was increased risk of nosocomial infections in Medical ICU.
So the Medical ICU was first selected for the institution of
isopropyl alcohol built antiseptic. In addition to the already
present soap dispensers, isopropyl alcohol based antiseptic was
also delivered in the soap machines.

Hand washing Guidelines and Materials
The APIC guidelines endorse the use of three to five mL of
soap, chloroxylenol solution, or the isopropyl alcohol
antiseptic solution for the mini
mum of ten to fifteen seconds
antiseptic solution for the mini
mum of ten to fifteen seconds
April, 2017
Available online at http://www.journalcra.com
International Journal of Current Research
Vol. 9, Issue, 04, pp.49486-49489, April, 2017
ISSN: 0975-833X
RESEARCH ARTICLE
NOSOCOMIAL INFECTIONS PREVENTED BY ANTISEPTIC HAND WASHING AND EDUCATION

*Attiq ur Rehman and Wafa Majeed
Punjab Medical College, Allied Hospital, Faisalabad

ARTICLE INFO
Article History:
Received 16th January, 2017
Received in revised form
18th February, 2017
Accepted 22nd March, 2017
Published online 30th April, 2017

Key words:
Nosocomial infections,
Hand washing,
Infection control, Antiseptics.

ABSTRACT
Nosocomial infections are the hospital acquired infections caused by the pathogenic microorganisms
such as bacteria, fungi, viruses and parasites. The purpose of this study was to demonstrate the
importance of the use of antiseptics in preventing and controlling the nosocomial infections. Hand
washing is the most important factor in controlling the transmission of nosocomial infections by
bacteria, viruses and pathogens. Most of the health care professionals do not wash their hands before
and after contact with the patients. This study was performed to improve the quality of life by
providing knowledge about the control of nosocomial infections. Tertiary health care facilities were
examined and it was found that there was a deficiency in the knowledge regarding the hand washing
and its role in the prevention of nosocomial infections.

INTRODUCTION
The most important factor in controlling the nosocomial infections is hand hygiene (Semmelweis, 1988; Rotter, 1997).
In spite of the developments in infection control results are not
constantly achieved in daily life (Jarvis, 1994; Rotter, 1998).
The adherence of the medical professionals to hand washing
and sanitation is considerably less than the prescribed values.
(Jarvis, 1994; Donowitz, 1987; Simmons et al., 1990; Tibballs,
1996; Lowbury et al., 1964; Rotter and Koller, 1991; Teare et
al., 2001). Professional education, speeches, lectures and
pamphlets have been associated with transitory advancement
(Jarvis, 1994; Simmons et al., 1990; Lund et al., 1994; Albert
of the hospital infections are caused by the transient flora
which can be easily removed by the hand washing (Albert and
tremendously decreases the risk of communication of
nosocomial infections. By regularly cleaning the hands health
care workers (HCWs) decreases the risk of communicating
nosocomial infections between patients. In view of this it is
now extensively believed that hospital acquired infections can
be significantly decreased by hand washing and hygiene
(Quraishi et al., 1984). Health care experts have strongly
encouraged the hand hygiene as the excellent measure in
controlling the transmission of infectious diseases.

*Corresponding author: Attiq ur Rehman,
Punjab Medical College, Allied Hospital, Faisalabad

Participants, methods and study Plan
Setting
Hand washing and hygiene study was conducted in tertiary
care teaching facility from August 2016 to December 2016 in
Medical ICU and Surgical ICU.

Study Plan
Baseline data was obtained without any interference in the
control period. Study plan was observational and prospective.
It was followed by an education intervention scheme
sanitization and hand washing. Due to the more number of
patients and extended stay of the patients in Medical ICU there
was increased risk of nosocomial infections in Medical ICU.
So the Medical ICU was first selected for the institution of
isopropyl alcohol built antiseptic. In addition to the already
present soap dispensers, isopropyl alcohol based antiseptic was
also delivered in the soap machines.

Hand washing Guidelines and Materials
The APIC guidelines endorse the use of three to five mL of
soap, chloroxylenol solution, or the isopropyl alcohol
antiseptic solution for the minimum of ten to fifteen seconds
(Simmons et al., 1990). In Iststage of research two hand
Hand washing disinfectants were used in the Medical ward ICU and Surgical ward ICU. The first disinfectant used was soap and the second was chloroxylenol solution. The third disinfectant used was isopropyl alcohol solution.

Hand washing Prospects

All the high risk procedures which involved contact with mucous membranes, secretions, excretions and damaged skin required thorough hand wash before and after the contact. They also included the procedures like changing or opening the vascular and intravenous lines. These events were listed and documented. One incident was considered complete after either touching a different site on the same patient or different patient or by touching any other surface. Hand wash after each incident was also calculated. Multifaceted procedures were counted as 1 incident, if it was not affected by any other procedure.

Documentation of compliance

One of the colleagues observed the hand washing habits of nurses and medical staff in medical ICU and Surgical ICU. The nurses and the medical staff were not informed about the plan of observing colleague during the control period. An assessment of experimental incidents was performed by concurrent recording of incidents by another person on 4 instances during the trial and outcomes were matched. The real number of hand washing and total number of possible hand washing opportunities were recorded during two hours observation periods at random intervals all over the day from 8 ‘o clock in the morning to 11 ‘o clock at night for 2 randomized ICU beds (25 minutes for every bed). For each study constituent observational time was fixed to fifteen hours. In addition to the direct observation, the number of soap, Chloroxylenol, and isopropyl alcohol antiseptic machine uses was calculated. Calculations were performed in Medical ward ICU and Surgical ward ICU. In order to regulate the number of patients in both units during the study periods, the number of machine uses was divided by the number of patient days.

Awareness, Teaching, motivation and intervention

Eight seminars and lectures were conducted in Medical ICU and Surgical ICU. The nurses and the associated staff was included in the seminars and lectures. The effectiveness of hand washing was demonstrated. All the medical are professionals were motivated to use hand sanitizer regularly prior to interaction with the patient and after interaction with the patients.

Patient and attendants education awareness

Different pamphlets were circulated among the patients and the attendants demonstrating the importance of regular hand washing in controlling the infectious and nosocomial diseases.

Statistical Analysis

The prime measure of the effectiveness of education, awareness, intervention and the isopropyl alcohol built hand antiseptic was hand washing compliance, calculated by dividing the number of hand washing incidents by the number of possible hand washing opportunities. These values were compared and assessed using Fishers exact test, X2 statistics and t test. All tests of statistical significance were 2 sided, and α level was set at .05.

RESULTS

Observational data

Health care workers hand washing compliance was observed for over 100 hours with a total of 1450 possible hand washing chances. In the Medical intensive care units most of the patients were on endotracheal intubation and respiratory care was generally observed in those patients. In MICU respiratory tract incidents were (34%) followed by vascular line incidents (32%) urinary tract 14% and others 20%. Whereas in surgical ICU most of the patients were associated with vascular line incidents 48%, respiratory care 22%, urinary tract 13% and others 17%. Before any interference nurses and other medical staff washed their hand prior to interaction with the patient and after interaction with the patient at rates of 11% (prior to patient interaction) and 27% (after the interaction with patient) in Medical ICU whereas in surgical ICU 3% (prior to patient interaction) and 12% (after interaction with patient) (Table 1). After professional education regarding the hand washing and hygiene the hand washing compliance was 18% (prior interaction with patient) and 32% (after interaction with patient) and in surgical ICU 6% (prior to interaction with patient) and 16% (after the interaction with patient).

Table 1. Result of Education awareness and intervention scheme on hand washing

<table>
<thead>
<tr>
<th>Category of ICU</th>
<th>Opportunity</th>
<th>Baseline</th>
<th>After education awareness and intervention</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical ICU</td>
<td>Prior to patient interaction</td>
<td>11%</td>
<td>18%</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>After patient interaction</td>
<td>27%</td>
<td>32%</td>
<td>0.503</td>
</tr>
<tr>
<td>Surgical ICU</td>
<td>Prior to patient interaction</td>
<td>3%</td>
<td>6%</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>After patient interaction</td>
<td>12%</td>
<td>16%</td>
<td>0.711</td>
</tr>
</tbody>
</table>

When the isopropyl alcohol containing hand antiseptic was introduced there was increase in hand washing rates. The rate of hand washing with isopropyl alcohol based disinfectant was 21% prior to interaction with patient and 44% after the interaction with patient (Figure 1).

Soap, Chloroxylenol and Isopropyl Alcohol-Based Disinfectant agent consumption data

Total of 284 438 dispenser consumptions were noted in Medical ICU and Surgical ICU (Table 2). Before any interference nurses and staff use was 125 with soap and 18 with Chloroxylenol in the Medical ICU. In Surgical ICU Chloroxylenol was not used, the rate of hand washing was 105 with soap. After the professional education and intervention soap use was increased up to 140 and Chloroxylenol use was increased up to 27 in Medical ICU. Whereas in Surgical ICU a decrease was noted with 88 soap consumptions. When the isopropyl alcohol based antiseptic
was introduced there was increase in the hand washing compliance. The total count of soap, Chloroxylenol, and isopropyl alcohol-based antiseptic solution did not increase despite a directly observed increase in hand washing compliance.

Figure 1. Effect of educational feedback intervention and isopropyl alcohol on hand washing compliance in the intensive care unit

Table 2. Result of education, awareness and intervention scheme on the rates of dispenser uses per day

<table>
<thead>
<tr>
<th>Type of Unit</th>
<th>Detergents</th>
<th>Baseline</th>
<th>After education, awarenessand intervention scheme</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Intensive Care unit</td>
<td>Soap</td>
<td>125</td>
<td>140</td>
<td>0.42</td>
</tr>
<tr>
<td>Surgical Intensive Care unit</td>
<td>Chloroxylenol</td>
<td>18</td>
<td>27</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>Soap</td>
<td>105</td>
<td>88</td>
<td>0.36</td>
</tr>
</tbody>
</table>

DISCUSSION

Most of the studies have demonstrated that the hand washing compliance is considerably low in medical health professionals (Zimakoff et al., 1993; LeClair et al., 1987) especially in the ICU (Conly et al., 1989; Bauer et al., 1990; McGuckin et al., 1997; McGuckin et al., 1997; Voss AWidmer et al., 1997). There is increased documentation supporting the role of hand washing in controlling the nosocomial and infectious diseases (Pittet et al., 1999; Donowitz, 1987). The increased risk of nosocomial infections makes the hand washing mandatory for health care professionals (Larson et al., 1997). The approach used by McGuckin et al was to determine the worth and price benefits of conjoining the distribution of pamphlets with a brief verbal introduction to patients (McGuckin et al., 1997). It resulted in considerably increased soap use rates, but in spite of this hand washing compliance was not seen. There is another fear that patient awareness program can adversely affect patient-health professional association. There is also a concern of time shortage among the nursing staff for washing hands. Voss and Widmer (1997) have recently addressed this issue. It was noticed that the time required for the use of soap was five to six times greater than the time required for the isopropyl alcohol built antiseptic solution. By offering a fast and safe disinfectant hand washing rates can be increased tremendously. Existing studies have demonstrated that hand washing compliance ranges from 14 % to 48% (Pittet DMourouga and PPerneget, 1999). But the previous studies have only shown the hand washing after contact with the patient. In our study we have calculated hand washing rates and its effects in controlling infectious diseases both before and after contact with the patient. At baseline tremendously low rates of 3% to 11% were noticed before interaction with the patient and 12% to 27% after interaction with the patient. However in our most consistent group, the hand washing rates were increased merely to 21% before patient interaction and 44% after patient interaction. Even if these rates are greater than the formerly described rates, there are still chances of improving approaches for hand washing. There are also several drawbacks. Long term follow up of patients cannot be done by this method. Studies have demonstrated that interferences and interventions have partial effect on the behavior of health care professionals (Donowitz, 1987; Larson et al., 1997). The second drawback is that the repeated feedback and long term interventions cannot be done by this method.

Conclusion

In summary, use of the easily available isopropyl alcohol, Chloroxylenol and soap markedly increased the rate of hand washing and thus helped in controlling the nosocomial infections. In addition education awareness and intervention also facilitated in preventing the transmission of infectious diseases and motivating the health care professionals to wash hands regularly.

REFERENCES


*****