

Impact on health care associated Infection rates by continuous training of nursing staff in our hospital

Ratna Mani, Ratna Rao

Department of Microbiology, Apollo Hospitals Hyderabad, India

doi: 10.3396/ijic.v8i2.018.12

Abstract

Over one million people die each year from complications of Health care Associated Infections (HAI). It also causes morbidity, increased health care cost for the patient. Awareness about HAI is increasing in India but there is no structured format for training on HAI prevention. We developed a course for the sisters to be trained on Infection control practices and implemented it. The baseline data of Infection control indices prior to training was compared with that of data collected post training. There was a remarkable decrease in the rates of HAI. We now conduct this training programme twice a year and have seen a constant improvement in our HAI rates. So we could control our HAI rates by simple initiative like basic training skills for our nurses. Such programmes and trainings are very effective and can be adapted by resource poor countries for bringing down their Health care associated infection rates.

Key words

CROSS INFECTION – prevention and control; INFECTION CONTROL – methods; NURSES; INSERVICE TRAINING

Introduction

The burden of health-care-associated infection (HAI) in developing countries is very high. Prevalence of health-care-associated infection (pooled prevalence in high-quality studies, 15.5 per 100 patients) has been reported in developing countries.¹ It is also responsible

for increased morbidity, mortality and health care cost for the patient. Though awareness for HAI is increasing in India, still there is no mandatory reporting. All the health care personnel are equally responsible towards prevention of HAI but Nurses are the most important front line staff.

Corresponding author

Ratna Mani

Department of Microbiology, xxx, India

Email: ratna.sharma@rediffmail.com

Our Institute is a 410 Bedded tertiary care Hospital with 96 bedded ICU. We get all types of cases referred as well as direct admissions, some with Multidrug resistant organisms (MDRO) infections. We have been practicing Infection Control since 15 years in our hospital. For the past 8 yrs we have also been collecting data on base line so as to start specific interventions. We tried to identify areas where we need to improve. We observed that there was need for more education in our nursing staff. The reasons being, one that they have absolutely no exposure to Infection Control Training as part of their curriculum, secondly being high attrition rate of sisters and thirdly lack of structured course for the sisters to be trained in Infection control practices (ICP).

We took this initiative in April 2006 and we formulated a programme wherein we decided to teach a group of sisters in each area the basic concepts of Infection control. These sisters were called Master Trainers (MT) and these MT had to teach five more sisters in their area so that all the levels are adequately trained. Standard definitions as per CDC guidelines of hospital-acquired infection were used. HAI was defined as per Centers for Disease Control and Prevention (CDC) definitions^{2,3} and NHSN surveillance methods.⁴ The infection definition was the same throughout the study period.

First step - Training

We first identified the nurses who needed to be trained in ICP. The sister In charge of each unit/Area was selected. A detailed training schedule was formed. It included frequency of training programme, topics to be covered and the speakers who were chosen from different specialties. This course was named as Master trainers course. We started the training programme for the sisters as per schedule. All the identified sisters were trained for a month on various topics of Infection control starting from basic bed side methods. Printed education materials was distributed to them and a lot of emphasis was laid on bedside training.

Workshops were conducted by the Intensivists on topics like proper suctioning techniques, Catheter care, Tracheostomy care, Care of patients on Central Line, patients on dialysis and ventilated patients and Bundle concepts for prevention of device associated infections

Second step - Evaluation

On completion of the training schedule, a theory and Viva exam was conducted for them. Those who passed the exam were the given designation of Master Trainers. They were also awarded certificates and given a badge. In addition to their daily duties they were to supervise the implementation of infection control practices. They also had to take bedside classes on the basic infection control practices. All the trainers were asked to keep a register where the topics taught were recorded. Regular check was kept on them by daily rounds of the Infection Control Team.

Third step - Data Collection and Analysis

The Infection control parameters, which were to be monitored, were Device associated infections like Ventilator associated pneumonias (VAP), Central line associated Blood stream Infections (CLBSI) and Catheter Associated Urinary tract Infection (CAUTI). Overall HAI rates also included any Hospital acquired pneumonias and Ventilator associated Tracheitis (VAT). The data was collected by the Infection control officer along with Infection Control Nurse during the daily rounds. CDC criteria for including them under HAI was used. All the device associated infections were expressed per 1000 device days.

Hand wash compliance was observed by a mystery observer. Consumption of Alcohol Hand disinfectant was also used as a surrogate marker for monitoring the compliance with hand wash. Once Infection Control indices were collected, a baseline data was generated.

Fourth step

All the sisters started implementing the practices which were taught as part of the training. After completing the training the tracking of the Infection rates was done. Infection Control team observed the compliance with Device care bundles on all patients on device care in all the ICUs.

Hand washing compliance was observed by watching if this was performed after specific tasks involved in the patient care. These included touching the patient IV lines, assisting in procedures, moving from a contaminated site of patient to a clean area. taking Blood pressure and moving from one patient to another.

Table 1. Infection rates and Hand hygiene compliance before and after the implementation of the Master Trainers Course

| Infection control parameter | Rates before implementation of master trainers course | Rates after implementation of master trainers course (6 months data) | | | | | | |
|-----------------------------|---|---|------------|------------|----------|-----------|-----------|-------------|
| | | August 2006 | March 2007 | April 2007 | May 2007 | June 2007 | July 2007 | August 2007 |
| HAI | | 7.2% | 4.3% | 4.8% | 4.4% | 3.4% | 4.0% | 4.2% |
| VAP (/1000 DD)* | | 18-22 | 15.1 | 9 | 16.4 | 13.0 | 10.1 | 14.7 |
| CAUTI (/1000 DD) | | 13 | 6.4 | 4.6 | 6.5 | 3.0 | 3.7 | 3.4 |
| Hand wash compliance | | Less than 30% | 45% | 58% | 54% | 61% | 60% | 57% |

*DD=device days

Initially there was no immediate improvements detected. After 3 months we gradually started seeing a reduction in VAP rates, CLBSI and CAUTI rates (Table 1).

There was a major improvement in the Infection control practices. Bundle compliance was being monitored daily in a chart by sister in charge. This intervention helped in reminding the sisters to check regularly all patients on devices for its compliance. In addition due to better awareness among the sisters on importance of hand wash the compliance rate improved and they also motivated the house keeping staff to follow the steps. The rates of HAI came down appreciably.

It was felt that there is a need to train and retrain the Nursing staff so as to have a better impact on HAI rates and better patient outcome. We now conduct this Master Trainers course twice a year.

In addition

We have started a ICU Weekly meeting where all the ICU sisters, Intensivists and Microbiologists meet and discuss different infection control topics. Clinical pharmacologist also attends this ICU meetings. There is bedside training and training in the simulation lab on patient care techniques.

Every year in September we have an Infection control week where we have Quiz programmes, slide shows to identify the mistakes and Poster presentations.

There are specially trained highly qualified nurses who are posted in different areas to supervise and train the sisters and to perform surveillance of infections in the hospital. Parameters like Bedsores, exposure keratitis and IV extravasations are also tracked as they are surrogate markers of Nursing care.

Conclusion

By implementing this training programme we have been able to achieve a marked reduction in our Infection rates and improvement in the infection control parameters. We have now done 10 such programmes and are introducing newer topics and have improved it by including more bedside training. We have also started a Six sigma (lean six sigma) course for the sisters in Infection control conducted by six sigma trainers. Lean Six Sigma training focuses on cutting costs and eliminating waste at all levels of a Healthcare organization. It helps improving processes, saving money, and better utilization of resources.⁵

First the infection control team went through training for Six sigma, then we implemented all the phases of six sigma and have been able to maintain the rates as per defined goals. It cannot be stressed enough that sisters, being the backbone of Hospital services, need constant training in various aspect of patient care. We have taken the initiative in infection control. Continuous training of the sisters forms the most important step in reducing health care associated infections. Motivation, support and incentives, in the form of awards like Best ward /Best ICU, Infection control Champion and appreciation in the form of Certificates, have helped us in sustaining this initiative.

References

1. Allegranzi B, Bagheri Nejad S, Combescure C, *et al.* Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. *The Lancet* 2011; **377(9761)**: 228-241. [http://dx.doi.org/10.1016/S0140-6736\(10\)61458-4](http://dx.doi.org/10.1016/S0140-6736(10)61458-4)
2. Centers for Disease Control and Prevention. National Nosocomial Infection Study Site
3. Definition Manual. Atlanta, GA: Center for Disease Control and Prevention 1999.
4. Garner JS, Jarvis WR, Emori TG, Horan TC, Hughes JM. CDC definitions for nosocomial infections, 1988. *Am J Infect Control* 1988; **16**: 128-140. [http://dx.doi.org/10.1016/0196-6553\(88\)90053-3](http://dx.doi.org/10.1016/0196-6553(88)90053-3)
5. Emori TG, Culver DH, Horan TC, *et al.* National nosocomial infections surveillance system (NNIS): description of surveillance methods. *Am J Infect Control* 1991; **19**: 19-35. [http://dx.doi.org/10.1016/0196-6553\(91\)90157-8](http://dx.doi.org/10.1016/0196-6553(91)90157-8)
6. Eldridge NE, Woods SS, Bonello RS, *et al.* Using the Six Sigma Process to Implement the Centers for Disease Control and Prevention Guideline for Hand Hygiene in 4 Intensive Care Units. *J Gen Intern Med* 2006; **21(S2)**: S35-S42. <http://dx.doi.org/10.1007/s11606-006-0273-y>