ORIGINAL RESEARCH PAPER

Volume-8 | Issue-7 | July - 2019 | PRINT ISSN No. 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

IMPLEMENTATION OF NABH STANDARDS FOR MANAGEMENT OF HEALTH CARE ASSOCIATED INFECTIONS IN A TERTIARY HOSPITAL

Medical Science

Dr. Raksha K* Junior Consultant & Infection Control Officer, Central Laboratory, St. Martha's Hospital, #5, opposite Reserve Bank of India, Nrupatunga Road, Bengaluru-560001 *Corresponding Author

Dr Ram Kumar VS Senior Consultant, Unit Head & Hospital Infection Control Committee Chairman, Department of General Medicine, St. Martha's Hospital, #5, opposite Reserve Bank of India, Nrupatunga Road, Bengaluru-560001

Mrs. Sunanda Rodrigus Infection Control Nurse, Hospital Infection Control Committee, St. Martha's Hospital, #5, opposite Reserve Bank of India, Nrupatunga Road, Bengaluru-560001

ABSTRACT

Introduction: Hospital infection control is seeing a paradigm shift in the current times and microbes know no borders. Health care associated infections(HAIs) have become a major concern with complex surgeries, prolonged hospital stays and rampant misuse of antibiotics. There is a need to implement and follow standard guidelines as suggested by National Accreditation Board for Hospitals and Healthcare Providers known(NABH) which is committed to support improvement of quality of healthcare service in our country for all strata of the population through various methodologies and tools to supplement the efforts of the providers of healthcare service.

Materials and Methods: We describe a prospective study between January-June 2018 for implementing the NABH guidelines for instituting hospital infection control standards in our hospital to document, monitor and reduce HAIs in our setting. We also discuss the need for the same, the pros and cons in the process of implementation.

Results: Key Quality Indicators were defined and monitored with definitions, checklists and trend analysis using Plan-Do-Check-Act (PDCA) cycle.

Conclusion: Our study helped us identify modifiable challenges to infection control practices within hospitals based on recommended guidelines. Infection control and prevention of HAIs is a continual process and is a critical component of all specialties of healthcare services, therefore requires more attention from hospital administration.

KEYWORDS

NABH, hospital infection control, healthcare associated infections, accreditation

INTRODUCTION:

Hospital infection control includes the prevention and management of infections in the hospital setting through the application of evidence-based knowledge to practices that include standard precautions, decontamination, waste management, surveillance and audit.

An infection control programme is considered efficient which, when used appropriately, restricts the spread of infection among patients and staff in the hospital. Good infection control programme also considerably reduces patients' morbidity and mortality, length of hospital stays, and cost associated with hospital stay. This is achieved by the prevention and management of infections through the application of research based knowledge to practices.(1) The purpose of this prospective study was to provide evidence-based information on the prevention and control of infection based on NABH standards of hospital infection control.

The Hospital Infection Control Committee (HICC) is a forum for multidisciplinary input and cooperation, and information-sharing which is committed to preventing health care associated infections and their related events, to improve patient care, and to minimize infections-related occupational hazards associated with the delivery of health care.

The HICC of our hospital formulated a well-designed, comprehensive and coordinated programme aimed at minimizing risks to patients, visitors and providers of care based on the 9 NABH Standards of Hospital Infection Control.

Figure 1: Approach to Hospital Infection Control practices based on NABH Accreditation

NABH identifies Healthcare Associated Infections (HAI) in two out of nine standards.(2)

- **HIC 4-** *The organisation takes actions to prevent and control Healthcare Associated Infections (HAI) in patients.*
- **HIC 5-** *The organisation provides adequate and appropriate resources for prevention and control of Healthcare Associated Infections (HAI).*

Definition of Healthcare associated infections (HAIs)

Healthcare associated infections (HAIs) are infections caused by a wide variety of common and unusual bacteria, fungi and virus during receiving medical care. This was earlier referred to as Nosocomial /hospital –acquired infections. For purposes of surveillance and simplicity of recording monitoring and intervention, the health care associated infections are divided into:

- Health care associated UTI
- Health care associated (ventilator associated pneumonia) {Ventilator associated event}
- Surgical site infections (SSI)
- Central-line associated blood stream infections (CLABSI)
- Catheter associated Urinary tract infection (CAUTI)
- Miscellaneous

Table 1: Definitions of HAIs (As defined by CDC Atlanta Georgia)(3)

TYPE OF INFECTION	DEFINITION
Surgical site infections -SSI	Any infection occurring within 30 days of an operative or accidental procedure involving a break in the designated epithelial surface with any of the following: At least one sign or symptom of infection is present, such as pain or tenderness, localized swelling, redness, or heat.

	Pus or culture – positive fluid discharges from a closed incision. A surgeon opens a closed incision, unless it is culture – negative. Incision dehiscence unless culture results are negative. Abscess diagnosed postoperatively using imaging techniques. Discharge of pus from beneath a drain.
Central-line associated blood stream infections -CLABSI	Primary bloodstream infection refers to a bacteremia (or fungaemia) for which there was no documented distal source and includes those infections resulting from an IV line or arterial line infection. Clinical sepsis has one of the following clinical signs or symptoms with no other recognized cause: fever (>38^0 C; Hypotension (systolic blood pressure < 90 mm Hg); or oliguria (<20 mL/h); plus all of the following: blood culture not performed or no organism detected in blood; no apparent infection at another site; and the physician administers appropriate antimicrobial therapy for sepsis.
Ventilator -Associated Events -VAE	Assesses after 2 calendar days of intubation and stabilization Ventilator associated Condition (VAC) FiO2 value (Fraction of Inspired Oxygen)-Increase ≥ 20 points PEEP value (Positive End Expiratory Pressure) Increase ≥ 3cm H2O Infection –Related Ventilator-Associated Complication (IVAC) Temperature ≥ 100.4 F ≤ 96.8 F Total WBC Count ≥ 12000 OR ≤4000 Cells/mm 3 New Antibiotic Change ≥ 4 days Possible and Probable Ventilator Associated Pneumonia (PVAP) 1.a. Secretion b. Culture 2.a. Purulent Secretion b. Culture 3.Direct Identification of Organisms
Catheter associated Urinary tract infection- CA-UTI	Symptomatic infection: a positive result on urine culture (> 10^5 microorganism / mL) and one of the following clinical signs; fever > 38 ^{0}C; urgency; frequency; dysuria; loin pain; loin / suprapubic tenderness Asymptomatic bacteriuria: urine culture of > 10^5 microorganism / mL of no more than two species, in the presence or absence of a catheter, no fever present (> 36^{0}C), urgency, frequency, dysuria, or loin / suprapubic tenderness

MATERIALS AND METHODS:

Study period: January to July 2018, 6 months
Study design: Prospective interventional study
Statistical models: Not applicable

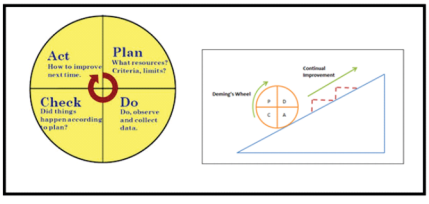

Figure 2: PDCA Cycle for Continual Improvement

Plan, Do, Check, Act (PDCA) cycle model (Figure 2) provides a framework for developing, testing and implementing changes leading to improvement. Using PDCA cycles enables us to test out changes on a small scale, building on the learning from these test cycles in a structured way before wholesale implementation.(9)

We applied this model for implementation for our infection prevention and control activities.

Key quality indicators identified and used for monitoring:
Catheter Associated Bloodstream Infection
Catheter Associated Urinary Tract Infection
Ventilator associated event
Surgical site infection
Sharps injury rate
VIP Score for thrombophlebitis

The Hospital Infection Control Team was formulated, after an internal audit non-compliance were identified based on NABH Standards. The infection prevention and control issues were discussed after daily rounds and on monthly meetings with the hospital management. The following steps were taken for the improvement of the infection control practices.

A. HICC Manual Revision based on NABH Standards – a detailed reference manual was made based on guidelines and recommendations on infection control practices with hard and soft copy across the hospital premises for all staff for use.
B. Definitions, criterions were established for HAIs with reporting instructions
C. Annual Training sessions for all doctors, staff nurses, technicians, housekeeping
D. Use of relevant checklists- Daily rounds checklist, Checklist for ventilator associated event (VAE), Checklist for central line associated blood stream infection (CLABSI), Checklist for surgical site infection (SSI), Checklist for catheter associated urinary tract infection (CAUTI), Surveillance checklist (for thrombophlebitis, CLABSI, CAUTI & VAE), Safe Surgery Checklist, Needle stick injury report and Root cause analysis (RCA) for needle stick injury-incident form.

RESULTS:

Implementation of Hospital Infection Control measures based on standard guidelines and references based on NABH has helped us streamline and organize our activities.

The Key Quality Indicators for the six-month period are as follows:

A.Catheter related blood stream infection

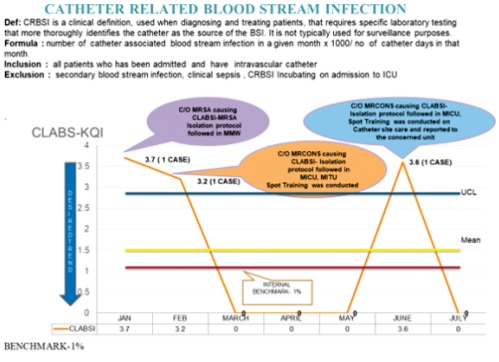

Figure 3: Trend analysis of Catheter related blood stream infection(CR-BSI)

Major changes:

- Definition of central line associated blood stream infection is standardized for practice
- Blood culture is used for diagnosis based on differential time of positivity. Central line tips are no more sent for culture which does not contribute to diagnosis
- Central line nursing care has improved in practice
- Checklists are in use for recording signs and symptoms of CLABSI

B.Ventilator associated event

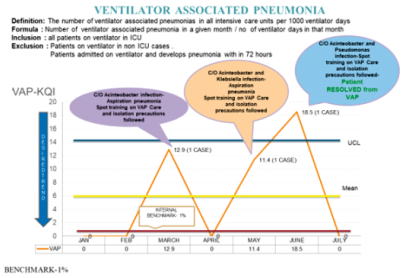

Figure 4: Trend analysis of Ventilator associated event(VAE)

Major changes:

- Definition of Ventilator associated event based on CDC guidelines is standardized for practice
- Ventilator care has improved in practice
- Checklists are in use for recording signs and symptoms of VAE
- Special focus is on critical care units to avoid Multi drug resistant infections with outbreaks notified and prevented with proactive reporting of laboratory and infection control team.

C.Catheter associated urinary tract infection

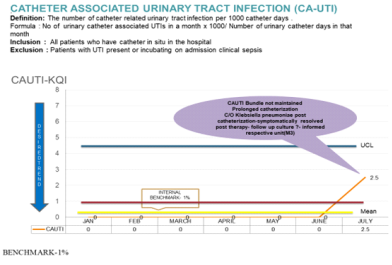

Figure 5: Trend analysis of Catheter associated urinary tract infection (CA-UTI)

Major changes:

- Definition of Catheter associated urinary tract infection based on CDC guidelines is standardized for practice
- Catheter care has improved in practice
- Checklists are in use for recording signs and symptoms of CAUTI
- Sample collection for urine culture has improved with less rates of contamination
- Prophylactic antibiotic use has been streamlined and de-escalation brought to practice.

D. Surgical Site infection

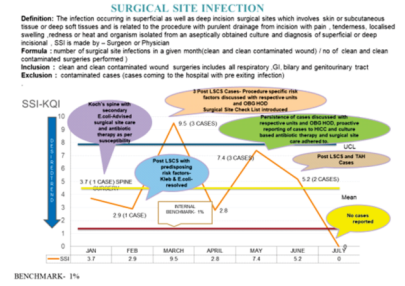

Figure 6: Trend analysis of Surgical Site Infection(SSI)

Major changes:

- Definition of Surgical Site Infection is standardized for practice
- Safe Surgery Checklists are in use for preventing SSI
- Sample collection for pus/exudate/aspirate and swabs has improved with regular training and clinical discussions
- Concept of colonizer and pathogen has been emphasized to aid treatment and unnecessary prescription of antibiotics
- Prophylactic antibiotic use has been streamlined and de-escalation brought to practice.

E. Sharps injury

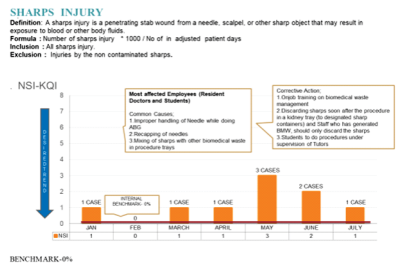

Figure 7: Trend analysis of Sharps Injury

Major changes:

- Awareness of sharps injury amongst staff with proactive reporting when such incidences occur
- Follow up testing and compliance is monitored by infection control team
- Awareness about immunization and Anti HBs titer values amongst staff has improved drastically

F.VIP (Visual inspection palpation) Score for Thrombophlebitis

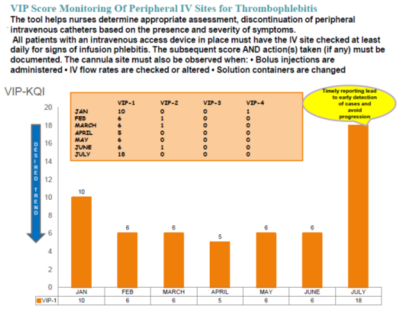

Figure 8: Trend analysis of VIP (Visual inspection palpation) Score for Thrombophlebitis

Major changes:

- Awareness of signs and symptoms of thrombophlebitis amongst staff nurses with early reporting
- IV-line care and monitoring are stringent and strict by the infection control team

DISCUSSION:

Scientific knowledge on infection prevention and control has increased during the last decade and led to the publication of many recommendations and guidelines at national and international levels. Despite such guidance, infection control is a major public health concern especially in Indian health care settings. There are many impediments and barriers to surmount before printed evidence-based clinical guidance translates into improvement in the quality of patient care.(4)

The strengths of our initiative measures were:

- A good hospital infection control team willing to understand and initiate evidence-based guidelines
- Strong documentation and communication effort
- Good interaction with the hospital management to notify important infection control issues
- Willingness to interact with other departments to contribute to infection control efforts
- Support of laboratory staff in identifying microorganisms and notifying infection control issues
- Clinical interaction with various departments on a case to case basis and training of residents with regards to infection control.

The challenges we faced during the study period:

- Data collection for analysis of KQIS, proactive reporting from clinician and came after repeated reminders, classes and calls
- Dissemination of data and recent guidelines, the protocols and procedures instituted needed to reach the end user i.e. hospital staff
- Support from ancillary departments-Human Resources, Quality Department, Information Technology, Housekeeping and Dietary

- Accessibility of HICC Manual to all staff after repeated efforts
- High attrition rate of hospital staff hence the constant need to train and monitor
- Understaffed HICC Team, lack of link nurses or doctors who share the same vision towards infection control

A limitation to this research is that it is possible staff may have altered their behavior during the unit observations. Another limitation is the continued process of practice with regards to infection control, a time frame of 6 months limits our ability to gauge the outcome of measures initiated since such large scale programmes do not show results overnight. The floating population adds to the bias.
It's a Herculean effort to improve infection control practices and the Infection Control Team of any hospital needs to be supported at all levels- administrative, managerial, technical and financial. Fortunately, infection control as a branch of medicine and medical management is being noticed in the past few years. Unless it comes from the 'Left Ventricle' of the Heart like one of our doctors at St. Martha's Hospital opined once on a lighter note, all the guidelines and standards are mere papers. Infection Control therefore is a major issue in Hospital Management and Quality Health Care, hence the need of these kinds of studies. Our findings indicate that despite active local leadership for infection prevention and control, ongoing regional and national initiatives, many challenges exist in the hospital environment. Key barriers included high patient occupancy rate, hospital design, and the use of workarounds to adapt to these challenges, several common problematic practices and the culture of the team or organization.

Another barrier to infection prevention and control at the hospital is the communication among members of the staff and family about patient on infections and precautions. Clear and effective communication is needed in order to foster a culture of safety.(5)

Despite the many barriers, some bridges to infection prevention and control exist. For example, the willingness to initiate accreditation. Infection control is a quality issue and patients have a reasonable expectation that they should not acquire infection in hospital. Accreditation is becoming integral to any hospital who wants to offer quality-of-care standards.

Various National and International agencies have prescribed guidelines for infection control quality parameters. Some of the popular guidelines followed in India are guidelines by various accreditation agencies like National Accreditation Board For Hospitals And Healthcare Providers (NABH), India (as per NABH accreditation standards manual, 2nd edition 2007) [Chapter 5: Hospital Infection Control (HIC)] And Joint Commission International (JCI, 6th Edition, Health Care Facility Management Standards: Prevention And Control Of Standards).(6)(7)

Data from a few facilities in India suggest that the implementation of HAI bundles is feasible and can reduce infection rates. Long term implementation of recommended procedures will require concerted efforts to strengthen infection prevention and control capacity among staff in healthcare settings. Thus, it is important to find ways to support standardised surveillance of healthcare associated infections in India and link the data to the implementation of infection control policies, interventions, and indicators that are suitable for local needs.(8)

The risk of HAIs in developing countries can exceed 25% compared to developed countries. Lack of awareness and institutional framework to deal with patient safety in general and HAI perpetuates the culture of acceptance of avoidable risks as inevitable.(9) It is also well recognized that poor infection prevention and control practices result in patient dissatisfaction, increases patient stay and overall costs including litigation. It is therefore imperative that a holistic approach be instituted to the prevention and control of infection.

Infection control has seen remarkable advances leading to more sophisticated data collection and analyses, and more efficient strategies for intervention in the hospitals. However, infection control is still under construction due to the introduction of new and sophisticated invasive procedures dictated by scientific developments which are changing the face of medicine especially with HAIs.(10)

CONCLUSION

Our study helped us identify modifiable challenges to infection control practices within hospitals based on standards and guidelines. Ongoing and regular in-service training on infection control for all cadres of healthcare workers is one of the interventions that can be applied to improve infection control practices. The issues of staff shortages and inadequately trained staff must be addressed at department and administrative level. It is imperative that hospital management work with the hospital infection control team to develop strategies to overcome the challenges in implementing and maintaining good infection practices throughout health facilities.

The practice of medicine is undergoing a paradigm shift from 'treatment' to 'diagnosis 'and 'prevention'. Evidence based medicine is the need of the hour in health care sector. It relies on strong scientific rationale where everything is measured and classified. Infection prevention and control falls into this category and upheld the doctrine of" First, Do No Harm".

Acknowledgment: We are grateful to all the staff of St.Martha's Hospital who participated and implemented recommended practices by the HICC Team during our study.

Conflict of interest: Nil

Previous presentation:
This study was a part of the dissertation project titled 'Infection Control Protocol in a Hospital' by Dr. Raksha K in partial fulfillment of the requirement of the award of the Post Graduate Diploma in Hospital and Health Care Management(PGDHHM) submitted to Symbiosis Centre of Health Care, Pune.

Source of funding: None

REFERENCES

1. Veeraraghavan B. Hospital Infection Control Guidelines. Indian Counc Med Res [Internet]. 2016;96. Available from: http://icmr.nic.in/guidelines/Hospital Infection control guidelines-2.pdf
2. National Accreditation Board for Hospitals and Healthcare Providers. Guide Book to Accreditation Standards December 2015 National Accreditation Board for Hospitals and Healthcare Providers (NABH). 2015;(December):240.
3. Horan TC, Andrus M, Dudeck MA. CDC / NHSN surveillance definition of health care – associated infection and criteria for specific types of infections in the acute care setting. 2005;309–32.
4. Birgand G, Johansson A, Szilagyi E, Lucet JC. Overcoming the obstacles of implementing infection prevention and control guidelines. Clin Microbiol Infect [Internet]. 2015;21(12):1067–71. Available from: http://dx.doi.org/ 10.1016/ j.cmi.2015.09.005
5. Backman C, Marck Beryl P, Krogman N, Taylor G, Sales A, Roth R. V. Barriers and bridges to infection prevention and control: results of a case study of a Canadian surgical unit. Can J Infect Control [Internet]. 2011;26(4):233–42. Available from: http://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=201 1417536&site=ehost-live
6. Joint Commission International. Assessment of Patients (AOP) Standards. Jt Comm Int Accredit Stand Hosp. 2015;(July):12–4.
7. Jitender Mehta, Sanjay Arya, Sunil Kant SKG. A Study of Hospital Infection Control Program against Normative Weighted Criteria at a Large Public Hospital. :130–2.
8. Swaminathan S, Prasad J, Dhariwal AC, Guleria R, Misra MC, Malhotra R, et al. Strengthening infection prevention and control and systematic surveillance of healthcare associated infections in India. BMJ. 2017;358:59–62.
9. Ponce-de-leo S, Macı AE. Infection Control : Old Problems and New Challenges. Arch Med Res [Internet]. 2005;36:637–45. Available from: http://ac.els-cdn.com.iclibezp1.cc.ic.ac.uk/S0188440905001906/1-s2.0-S0188440905001906-main.pdf?_tid=2fdc3822-7f43-11e4-8b0a-00000aab0f 27&acdnat=1418088907_b785ae8f29cf858246f7c324a67502d6
10. Sarma J, Ahmed G. Infection control with limited resources: Why and how to make it possible? Indian J Med Microbiol [Internet]. 2010;28(1):11. Available from: http://www.ijmm.org/text.asp?2010/28/1/11/58721