ORIGINAL ARTICLE

Assessment of infection control practices in teaching hospitals of Quetta

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Abstract

Objective: To identify the gaps in infection control and prevention practices in teaching hospitals.

Methods: This cross-sectional study was conducted at Bolan Medical Complex and Sandeman Medical College Hospital, Quetta, from August 2012 to January 2013.The study comprised members (n=7) of infection control committee who were interviewed through a self-developed, closed-ended questionnaire and their perception regarding infection control and prevention was recorded. Data was analysed using SPSS 16.

Results: Only 3(42.9%) of the committee members believed that the administrative factors for causing hospital-acquired infections were nurse-patient ratio. On the patient care side, 1(14.3%) participants at one of the hospitals attributed infections to antibiotic use, 5(71.4%) to invasive medical device and 1(14.3%) to other factors.

Conclusion: Poor perception held by the members of infection control committee was the basic cause of bad outcome. Capacity-building of all the stakeholders is required.

Keywords: Infection control, Hospitals, Knowledge, Practices. (JPMA 66: 947; 2016)

Introduction

Pakistan is a country with double burden of disease, in which the burden of infectious diseases is more than 40%. The rest is accounted for non-communicable diseases (NCDs). As the hospitals are places where maximum interaction between the sick and the healthy occurs, the probability of the break-up of chain of infection increases. Hospitals generate infectious and non-infectious waste in the process of service delivery to the population. Approximately 25% of the waste generated is infectious and toxic, while 75% is non-infectious and comes under the category of municipal waste. The infectious waste poses a threat to the hospital staff and community at large.[1] The knowledge of infection control (IC), the attitudes and practices appeared to be heavily influenced due to lack of an enabling environment in training hospitals and internship hospitals.[2]

Infrastructure, daily patient flow and prevalent disinfection techniques all play a significant role in transmission of infections. Simple measures to tackle the cross-infection potential can help to reduce hospital-acquired infections (HAIs) through internal quality improvements.[3] Failure to comply with scientific guidelines has led to numerous outbreaks.[4]

The risk of serious complications due to HAIs is particularly high for patients requiring intensive care.[5] A number of factors are likely to contribute to this problem, including increasing rates of antimicrobial resistance (AR), the development of progressively more-complex medical procedures and invasive medical technology that place patients at risk for procedure- or device-related infections, and an increasingly elderly and immunocompromised patient population.

In countries like Pakistan, weak public health legislation provides a window of opportunity to recycle waste into the health sector again, thus endangering public health and promoting spread of blood-borne infections (BBIs) like viral hepatitis and human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS).

This study was planned to analyse the situation of infection control practices (ICPs) in teaching hospitals.

Subjects and Methods

This cross-sectional, descriptive study was conducted at Sandeman Medical College Hospital (SMCH) and Bolan Medical Complex (BMC), Quetta, from August 2012 to January 2013. Members of infection control committee (ICC) were interviewed using a questionnaire and their perceptions were recorded.

ICPs were observed at: outpatient departments; operation theatres; labour rooms; and laboratory and blood banks.

The teaching hospitals of Quetta and ICC members were included. Hospital managers who were on leave at the time of the survey were excluded. Institutional approval from head of both the hospitals was obtained, while ethical approval was taken from the ethical committee of Health Services Academy. Informed consent

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(written/verbal) was taken from the subjects. To ensure participant confidentiality, all questionnaires were kept in a safe place.

Centres for Disease Control (CDC) Atlanta Georgia tools were used for assessing hospitals' ICPs.[6] A field guide was used to assess perception of ICC members.

Data was collected regarding the following variables: experience, age, designation, postgraduate course/training of ICP, factors for HAIs, perceived time constraints in IC and prevention, presumption that the patient was not infected, standard operating procedures (SOPs) for ICP , monitoring the IPC, audit checklist for ICP, holding meeting for ICP, continuing medical education (CME) on HAIs and ICP, hand-washing practices, survey in hospital for evaluation of ICP, drug-resistant microorganism poses hazards in HAIs, stewardship of antimicrobial use, surveillance system, personal protective equipment (PPE) for the staff concerned, sterile barriers, well-established hospital waste management system, disinfection and sterilisation.

SPSS 16 was used for statistical analysis. The descriptive analysis included frequencies and percentages of categorical variables, whereas means and standard deviations of continuous variables were calculated. Cross-tabulation was done to see any relationship between two variables by applying chi-square. P<5% was considered statistically significant.

For the purpose of the study, the level of perception was categorised as follows: perception (85% or above); partial perception (75% to 80%); and minimal perception (74% or below).

Summary scores were graded as:

75-100% possible points: E (Excellent practice); 50-75% possible points: G (Good practice); and <50% possible points: P (Poor practices).

Results

The perception of ICC members on infection control and prevention at BMC and SMHC were recorded (Table-1). Factors of HAIs due to administrative reasons were noted

Table-1: Perception of ICC members on Infection control and prevention.

Question asked	BMC Response		SMCH Responses	
	Yes	No	Yes	No
Perceived time constrain	2	5	2	5
Thinks ICP inconvenient	4	3	3	4
Presumption that Pt was not infected	4	3	3	4
Measurable SOPs	4	3	4	3
SOPs for IPC in Hospital	3	4	2	3
Easy Applicable SOP	3	4	3	4
Daily monitoring ICP	2	5	2	5
Chek List ICP available	3	4	3	4
Frequent Meeting ICP Weekly	7	0	7	0
CME on HAI/IPC for Staff	1	6	1	6
Regular Hand washing practice of staff	4	3	4	3
Necesity of SOP for ICP	4	3	4	3
satisfaction on ICP in Hospital	2	5	2	5
Conduct survey for evaluation of ICP	0	7	0	7
Hazards of HAIs due to Drug resistant microorganism	3	4	3	4
Stewardship in antimicrobial Use	3	4	3	4
Existing Surveillance system for Outbreak control	0	7	0	7
Posters of Hand washing (ICP)	1	6	1	6
Availability of Disposable PPE	1	6	1	6
Use of sterile barrier (mask, cap, gloves etc)	3	4	3	4
Remove PPE after use	2	5	2	5
Hospital waste management	7	0	7	0
Disinfection and sterilization system	1	6	1	6
Total Responded Q	64	97	61	100

ICC: Infection control committee. SOP: Standard operating procedure
ICP: Infection control practice. HAI: Hospital-acquired infection
PPE: Personal protective equipment.

Table-2: Factors of Hospital Acquired Infections due to Administrative reasons.

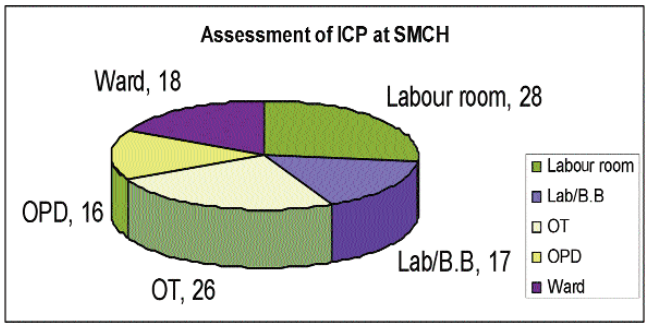
Factors of HAIs on Administration	BMC		SMCH	
	Frequency	Percent	Frequency	Percent
Nurse patient ratio	3	42.9	2	28.6
Level of staff education	3	42.9	3	42.8
Lack of instruments/equipments for ICP	1	14.3	2	28.6%
Total	7	100.0	7	100.0

BMC: Bolan Medical Complex
SMCH: SandemanMedical College Hospital
ICP: Infection control practice
HAI: Hospital-acquired infection.

Table-3: Factors of HAIs on patient-care.

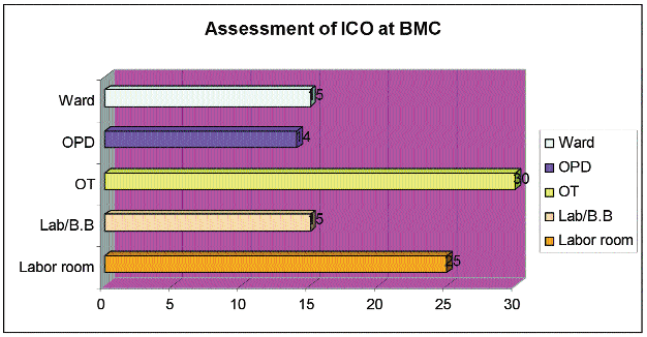
Factors of HAIs on Patients care	BMC		SMCH	
	Frequency	Percent	Frequency	Percent
Antibiotic use	1	14.3	3	42.9
Invasive medical device	5	71.4	3	42.9
Others	1	14.3	1	14.3
Total	7	100.0	7	100.0

BMC: Bolan Medical Complex
SMCH: SandemanMedical College Hospital
HAI: Hospital-acquired infection.



Scoring:
28= Good 26 = Good 16 = Poor 17 = Poor 18 = Poor

Figure-1: Assessment of Infection Control Practice at Sandeman Medical College Hospital.



Scoring:
Labour Room: 25= Good Lab/ Blood Bank: 15 = Good
O.T 30 = Poor OPD: 14 = Poor
Ward: 15 = Poor

Figure-2: Assessment of Assessment of Infection Control Practice at Bolan Medical Complex.

separately (Table-2). At the BMC, 3(42.9%) members believed that the administrative factors for causing HAI were nurse-patient ratio and the level of staff education on IC and prevention. Only 1(14.3%) blamed lack of equipment. At the SMCH, 2(28.6%) members believed that the administrative factors for causing HAI were nurse-patient ratio,3(42.8%) thought level of staff education was to blame, while 2(28.6%) linked HAIs to equipment shortage (Table-2).

On the patient-care side, 1(14.3%) at the BMC attributed HAIs to antibiotic use, 5(71.4%) to invasive medical devices and 1(14.3%) to other reasons. At the SMCH, the percentages were 3(42.9%), 3(42.9%) and 1(14.2%), respectively (Table-3). The outcome score of assessment regarding the measures taken in Labour room, Laboratory/Blood Bank, Operation Theater OPD and Wards For Infection Control And Prevention In BMC and SMCH are presented in Figure-1 and 2.

Discussion

ICPs' highest goal is to ensure that the clinical community has the information to protect patients and personnel from adverse events. The department provides expertise in the epidemiological method through education, research, consultation, surveillance and investigation of disease clusters, environmental laboratory services, quality improvement and policy formation. These services exist to meet the needs of all persons associated with the BMC and SMCH, particularly the patient, for the prevention of infectious complications. The department is a responsible and contributing member of its hospital community. The infection control committee at BMC comprised administrator, ICP specialist (head), representatives of medicine and surgery department, pathologist, pharmacist and nursing head.

The Infection Control Services (ICS) department is an administrative department at the University of Michigan Medical Centre (UMMC). There are six staff members: a manager, four staff specialists, and a medical secretary. The manager is accountable to an administrator and a medical director (the hospital epidemiologist).[7] In our study, as BMC/SMCH was in the public sector, there was administrator (master of surgery) rather than manager. The composition was different in our study area because of public sector organisation.

The ICS department used quality techniques to develop its mission statement, identify customers, identify customer requirements, and develop quality improvement objectives to meet the requirements. A service evaluation of customers resulted in specific improvement activities. An unexpected result of this evaluation was the difference noted between the ICS staff members' perception of customer requirements and these customers' actual needs. IC practitioner should use the continuous quality improvement tools and techniques to enhance their activities within their institutions, to better meet their customer needs, and to make sure that they are complementing their institution's mission.[7]

Some of the functions of an ICC are:

1) Establishing a system for identifying infections or suspected sources of infections by means of departmental rounds, review of clinical reports and also identifying at-risk patients and taking appropriate actions.

2) Assessing on an ongoing basis whether recommended precautions are being adhered to, i.e., hand hygiene, waste management, disinfection and sterilisation. Investigating the spread of infection outbreaks in collaboration with medical, nursing and other staff.

3) Planning and conducting ongoing in-service training programmes in order to ensure that all members of staff are sensitised to measures to prevent the transmission of infections.

4) Encouraging participation of all health care facility staff in infection prevention and control by orientation, regular meetings and in-service education.

5) Reviewing the levels of nosocomial and other infections (including identifying common sources and routes of entry of infections) on a monthly basis and implementing recommendations where necessary.

6) Monitoring and surveillance processes are required to ensure compliance by employees with the infection prevention and control policies and guidelines throughout the health care facility. This is accomplished through a series of audits and quality control activities. Information technology with relevant software and office space shall be provided to conduct meetings.[8]

In the current study, there was no surveillance or evaluation conducted in both hospitals for infection control and prevention. Regarding the perception of ICC members at BMC, they collectively obtained 39.7% score, which is poor, but slightly better than SMCH. The maximum three members in ICC possessed the experience of 16-20 years, two members had experience of 11-15 years, while one each member had experience of 6-10 and 21-25 years, respectively.

There were 42.9% of the ICC members who believed that the administrative factors for causing HAI were nurse-patient ratio and level of staff education on IC and prevention. Only 14.3% considered lack of equipment as a factor for HAIs. It is also suggested by Jan et al. that the lack of knowledge and practices regarding basic IC protocols should be improved by way of educational intervention, in the form of formal training of the doctors and nurses and reinforcement of the same.[9]

In this study, a majority (71.4%) of the members at BMC believed that the patients care factors for causing HAI was invasive medical device. Only 14.3% thought of improper antibiotic use and others may lower immunity level of the patients. Patients care factors was believed by the majority of ICC members causing HAI followed by administrative factors.

To assess the perceptions and attitudes of the health care workers (HCW) concerning ICP in Brazilian hospitals, we

conducted a cross-sectional survey using a self-administered online questionnaire during a web-based course (WBC) on IC and AR. Of the 6,256 Brazilian HCWs registered for the WBC, 1,998 were members of ICCs and answered the survey. Most professionals reported that their hospitals perform microbiologic surveillance targeted at epidemiologically important multidrug-resistant (MDR) organisms, but the majority underestimated the prevalence of AR.[10] In our study, 14% thought that HAIs might be due to improper use of antibiotics. Academic hospitals are particularly concerned with IC. Domains such as surveillance of endemic hospital infections, specific preventive protocols, antibiotics policy, and staff education should be addressed by IC committees. Inspection process plays an important role in assessing and improving ICPs. Facilities should review the audit tool and evidence-based guidelines practices and that their staffs understand and follow the procedures outlined in their written policies.[11]

Conclusion

Domains such as surveillance of endemic HAIs, specific preventive protocols, antibiotics policy, and staff education should be addressed by ICCs. Professionals perception of IC and prevention at both BMC and SMCH was poor.

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Conflict of Interest: None.

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References

1. Yaqub KM, Tariq M, Janjua SK, Masroor R, Safdar A, Ahmad S. A survey of infection control practices of consultant anesthesiologists in teaching hospitals of Pakistan. J CollPhysSurg Pak . 2007; 17:523-6.
2. Kamulegeya A, Kizito AN, Balidawa H. Ugandan medical and health sciences interns infection control knowledge and practices.J Infect DevCtries. 2013; 7:726-33.
3. Rasam SA, Apte KK2, Salvi SS.Infection control in the pulmonary function test laboratory. Lung India. 2015; 32:359-66.
4. Umscheid CA, Agarwal RK, Brennan PJ,HealthcareInfectionControlPracticesAdvisoryCommittee. Updating the guideline development methodology of the Healthcare Infection Control Practices Advisory Committee (HICPAC). Am J Infect Control. 2010; 38:264-73.
5. Gorman GW. Protocol for sampling environmental sites for infection, Appl Environ Microbial 2007; 53:154-8.
6. O'Rourke EJ. The first HICPAC guideline: CDC Hospital Infection Control Practices Advisory Committee. Am J Infect Control. 1995; 23:50-2.
7. Friedman C, Barnette M, Buck AS, Ham R, Harris JA, Hoffman P, et al.Requirements for infrastructure and essential activities of infection control and epidemiology in out-of-hospital settings: A Consensus Panel report. Am J Infect Control. 1999; 27:418-30.
8. Eichacker PQ, Natanson C, Danner RL. Surviving Sepsis -- Practice Guidelines Marketing Campaigns &Eli Lilly. N ENGL J MED.2006; 355:1640-2.
9. Jain M, Dogra V, Mishra B, Thakur A, Loomba PS. Infection Control practices among doctors and nurses in atertiary care hospital. Ann Trop Med Public Health.2012; 5.29-33.
10. Guerra CM, Ramos MP, Penna VZ, Goto JM, Santi LQ, de Andrade SV, et al.Perceptions and attitudes of the professional staff concerning infection surveillance and control programs in Brazilian hospitals.Am J Infect Control. 2010; 38:59-62.
11. Schaefer MK, Jhung M, Dahl M, Schillie S, Simpson C, Llata E,et al.Infection Control Assessment of Ambulatory Surgical Centers, JAMA. 2010; 303:2273-9.