

## Original Research Article

# Analysis of patient knowledge and awareness about risk and management of surgical site infections

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### ABSTRACT

**Background:** Surgical site infections (SSIs) are one of the leading causes of death, and its prevention is a key element health care sector. However, patient perceptions about barriers experienced while seeking care have not been assessed in depth. Hence, the study was carried to examine patients' awareness and understanding of SSI risks and consequences.

**Methods:** The study was carried out by surveying by collecting patient demographics, history and treatment details by direct patient interview. The survey asked a series of questions regarding SSI specifically addressing patients' knowledge of factors associated with increased risk and consequences of infection, and was developed after reviewing the patient education guides for SSI, which has been endorsed by the help of infection control department.

**Results:** A survey was carried out with 74 participants; most of them were familiar with SSI manifestations and consequences. Total of eight patients (11%) had a previous SSI before their current surgery or current SSI. The discussion of healthcare workers regarding the SSI should not reach in 42% of the patients, but 20% of the patients were taken part in discussions 2 or more times. Only forty-six percentages of the patients are comfortable with their existing knowledge regarding SSIs; 54% of the patients are willing to improve their knowledge about SSIs and its preventive strategies.

**Conclusions:** Hence, better strategies are needed to promote patient awareness of and engagement in reducing SSI risks and consequences and promoting the prevention of SSI.

**Keywords:** Surgical site infections, Knowledge, Infection, Patient education

### INTRODUCTION

Healthcare-associated infections (HAIs) are considered as the common public health issue affecting millions of people throughout the world. Several studies reports, more than 5% incident rate of HAIs in developed countries and the frequency is much higher in the developing nations.<sup>1</sup> Catheterization associated urinary tract infections (CAUTI), ventilator-associated respiratory tract infections (VARTI), cannulation associated bloodstream infection is the typical type of

Healthcare-associated infections (HCAIs). Most literature revealed that surgical site infections (SSIs) were the most common healthcare-associated infections accounting for more than 30% of cases of HAIs.<sup>2</sup> Surgical site infections are the most common infection condition occurring for a patient while managing surgical conditions in the health care settings. The prevalence of SSI ranges from 0-17%.<sup>3,4</sup> Pattern and intensity of SSIs may vary from place to place; it is measured as a leading reason for hospital dropouts, increased morbidities and mortalities. Many of the infections are possible to occur from intensive care

unit, surgical units, and delivery units. The post-surgery care cost may become very high due to SSI and leads to increased length of hospital stay and mortality. The attributable morbidity and mortality are significant, with patients who experience SSIs being 60% more likely to spend time in the intensive care unit, five times more likely to be readmitted to hospital and twice as likely to die than patients without SSIs.

Several studies report the role of both intrinsic and extrinsic factors for the development of SSIs.<sup>5,6</sup> Factors like obesity, smoking, addiction to alcohol, malnutrition, advanced age, metabolic diseases, history of diabetes mellitus, immune-suppression, hypoxia and length of preoperative stay are considered as the intrinsic factors associated with SSIs. Moreover, antibiotic prophylaxis, dressing techniques, surgical drains, surgical implants, preoperative skin preparation, surgical hand scrubs, application of skin antiseptics, inadequate sterilization of instruments, and preoperative shaving were among the most frequently reported extrinsic factors. Awareness about these risk factors helps in a modification in preoperative and postoperative procedures. Prevention and management of SSI have an essential role in the upgradation of care quality among the patients. Several regulations are available for the minimization of HCAI in hospital settings; all the regulations are based on the improvement of the hygienic practice of healthcare workers.<sup>7</sup>

The intra and extra operative environments are the main sources for the occurrence of SSI. Whereas many risk factors for the development of SSIs are related to patient characteristics that cannot be easily modified, there are a variety of system or hospital factors that can be manipulated. These include improper selection and administration of antibiotic prophylaxis, intraoperative hypothermia and intraoperative hyperglycemia. Hence, management and prevention of SSI are important. By preventing the patients of the overall intervention outcome can be improved by decreasing the time of hospital stay, increasing recovery time, and reducing the cost of hospital stay. Despite advances in recent years, such as pre-operative antibiotic prophylaxis optimization, screening for and treatment of *Staphylococcus aureus* carriage and perioperative normothermia, prevention of SSI remains challenging. As part of a comprehensive approach to SSI prevention, the Joint Commission recommends that patient education be undertaken; however, data on patient awareness of SSI are scarce. We surveyed to examine patients' awareness and understanding of SSI risks and consequences.

## METHODS

A prospective observational study was conducted at the department of surgery, MES Medical College, Perinthalmanna, Kerala, a tertiary level teaching hospital having the capacity of 600 beds.

## Study population

The study consist of 74 patients who recently underwent a surgical procedure and therefore at risk of SSI or who were already diagnosed with an SSI (November 2017-May 2018), who are willing to participate in the study.

## Exclusion criteria

Patients who were not willing to participate in the study, not able to respond, were deemed cognitively impaired, or were under the age of 18 years were excluded from the study.

## Data collection and study design

Data were collected by direct patient interview using a questionnaire and from case records which contain patient demographics, history and treatment details. The survey asked a series of questions regarding SSI, specifically addressing patients' knowledge of factors associated with increased risk and consequences of infection, and was developed after reviewing the patient education guides (FAQs) for SSI, which have been endorsed by the help of infection control department. The initial draft of the questionnaire was prepared, and the mock trial was conducted on 5 different patients with the help of an infection preventionist. Responses to questions were recorded on a 5-point Likert-style scale with answers ranging from "strongly agree" to "strongly disagree."

## Statistical analysis

Data collected from the study was tabulated in Microsoft Excel 2010 and were keyed into the SPSS and analyzed by appropriate statistical methods.

## RESULTS

A total of 76 patients was identified as eligible and invited to participate. 74 participants completed the survey (97% response rate). Table 1 summarizes the demographic characteristics of the respondents.

Overall, study population consists of 61% of women and 67% of participants were 60 years or above, 96% of the participants had school education, or above school education, 64% were residing at urban area. The habit of smoking was found in 22% of participants and 11% were having the habit of drinking.

Our study reports that 94% of patients were admitted previously in hospitals due to several reasons. A total of 91% of the patients had previous surgeries; among them, 31% of the patients had recent surgeries within the last two years. Thirty-eight patients had a history of chronic disease. Total of eight patients (11%) had a previous SSI before their current surgery or current SSI, and 38% of these patients reported with a previous history of SSI

within the last two years. Five patients (7%) had a previous healthcare-associated infection other than SSI. Among them, CAUTI was reported in 3 cases, and central line-associated bloodstream infection (CLABSI) were reported in 2 cases. The discussion of healthcare workers regarding the SSI should not reach in 42% of the patients, but 20% of the patients were taken part in discussions 2 or more times. Most of the time, the health care workers spent less than 5 minutes for the discussion of SSIs. Fifty-three percent of the patient population were aware of the health facts regarding SSI. Fifty-one percent

of the patient population stated that the information regarding the SSIs was learned from outside hospital. Only forty-six percentages of the patients are comfortable with their existing knowledge regarding SSIs; 54% of the patients are willing to improve their knowledge about SSIs and its preventive strategies. Majority of the populations are acquired their knowledge from newspaper or magazine and the internet. Total of 64% of patients reports that education about SSIs can be improved with proper strategies.

**Table 1: Demographic characteristics of the study population.**

Parameter	Groups	No	%
Age (in years)	18-30	10	13
	31-45	7	9
	45-60	8	11
	Above 60	49	67
Sex	Men	29	39
	Women	45	61
Education	No school	3	4
	School	25	34
	Higher secondary	21	28
	Graduation	16	22
	Post-graduation and above	9	12
Residency	Rural	47	64
	Urban	27	36
Smoking	Yes	16	22
	No	58	78
Drinking	Yes	8	11
	No	66	89

**Table 2: Patient characteristics, awareness, and knowledge of SSI prevention.**

Parameter		No	%
Number of previous hospital admissions	None	4	6
	1-5	52	70
	6 or more	18	24
Any other previous surgeries	Yes	67	91
	No	7	9
If yes, any within the last 2 years	Yes	23	31
	No	51	69
History of chronic disease	Yes	38	51
	No	36	49
History of any HAI besides SSI?	Yes	5	7
	No	69	93
If yes, which HAI	CAUTI	3	60
	CLABSI	2	40
Previous SSI	Yes	8	11
	No	66	89
If yes, within last 2 years	Yes	3	38
	No	5	62
How many times did any HCW discuss SSI	Zero	31	42
	One	28	38
	2 or more	15	20

Continued.

Parameter	No	%	
How much total time spent talking with HCW, min	None	31	42
	<5	37	50
	5-15	6	8
	>15	0	0
Received health facts for you	Yes	39	53
	No	35	47
Learned about SSI outside the hospital	Yes	36	49
	No	38	51
If yes, by what source	Work	2	5
	Clinic/provider	6	17
	Newspaper/magazine	14	39
	TV	2	6
	Internet	12	33
Can education about SSIs be improved	Yes	47	64
	No	27	36
Comfortable with your level of knowledge about SSIs	Yes	34	46
	No	40	54

Providing more frequent education and reinforcement, providing talks and educational materials and review the health facts before surgery, reviewing the risks of infection before surgery are the answers of the participants in response to a question about how education regarding SSI prevention could be improved. The patient population was aware of the signs and symptoms of SSIs. Fifty-four percentages of the study participants are aware of the adverse consequences and manifestations of SSIs. Majority population suggested that the occurrences of SSIs are more often than they expect the SSIs. Forty-two percentage of population were unaware of the risk factor of smoking in the development of SSIs.

## DISCUSSION

The study was performed in a tertiary care teaching hospital; the patients were educated and had surgical procedures. As the patient population is educated, most of them were familiar with SSI manifestations and consequences, majority of them were earned their knowledge regarding SSIs from the outside of the hospitals such as internet, magazines, etc. The information's from websites and internet sources may not be accurate and up-to-date. Hence the health care workers have an important role in the community teaching regarding surgical site infection and its management strategies. Our study reports the lack of awareness programs from the health care workers, more than 40% of the patient reports that the health care workers never discussed the SSIs during their hospital stay. These findings are more disturbing because 86% of the patients among the SSI prevention discussed category stated that hospital workers took only less than 5 minutes during their entire hospitalization for the discussion regarding the SSIs.

Although some patients were given with the health care tips by providing leaflets, only a few of them were recalling about this, many of the patients did not read this or took in a serious way. Whereas this informational sheet is a simple, inexpensive educational intervention, it may not be the best way to communicate with patients regarding SSI education, given that, overall, majority of patients thought that education regarding SSI could be improved by oral presentations. The patient communities suggest that education regarding the SSIs and its preventive strategies should be discussed by the healthcare workers, especially doctors or nurses. They also suggest improving the frequency of healthcare learning with spending more effective time on the discussion of SSIs.

It could be better if the discussion of infection and its preventive strategies are conducted before surgery. A previous study conducted in the West Indies with 52 participants also reported the same.<sup>8</sup> Another study reported from France by including 161 patients undergoing digestive surgery, who were provided SSI informational leaflet and oral information. The result shows a better satisfaction among patients provided the oral information compared to leaflets.<sup>9</sup> Findings from our study are similar and suggest that patient preferences need to be incorporated into any patient education and engagement strategy for prevention of SSI. We had conducted the study in a small group of population in a teaching institution; this could be a limitation of our study.

## CONCLUSION

SSI is one of the most common healthcare-associated infections which have a great impact on patient safety. Post-discharge SSI are a major source of morbidity, expense, and anxiety for patients. The

antimicrobial restriction is not more effective than the persuasive strategy in achieving the goal of controlling antimicrobial use in the long term. Moreover, in many settings, there may be inadequate personnel for a restrictive approach and restriction strategies fail to consider the appropriateness of use of non-restricted antibiotics, which makes up the vast majority of antibiotics used in the hospital. Patients have a crucial role in the prevention and management of SSIs. Hence, better strategies are needed to promote patient awareness of and engagement in reducing SSI risks and consequences and promoting the prevention of SSI.

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