Awareness and level of knowledge of Surgical Site Infection among Surgical Staff in King Abdullah Medical City in Hajj-2019: A Cross-Sectional Study

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Abstract

Background: Surgical site infection (SSI) is a microbial infection of the surgical wound during 30 days of any procedure or within 1 year after the operation. More than 1,600 operations are performed in Makkah during Hajj every year. Many studies examined SSI awareness internationally but up to our knowledge non studies were conducted in Makkah. The purpose of this study is to assess the level of knowledge about SSI among Surgical staff in KAMC during Hajj.

Methods: A cross-sectional study conducted to assess the Awareness and level of knowledge of Surgical Site Infection among Surgical Staff in King Abdullah Medical City those who had been participating in healthcare provider team of Hajj season of 2019 using a 20-item anonymous multiple-choice questionnaire

Result: About 39.2% of respondents had poor knowledge, 50% had fair knowledge while only 13.7% had good knowledge. There was a relationship between years of experience and level of knowledge. Surgical subspecialty was not associated with the level of knowledge. Almost 20% of respondents did not recognize the SSI definition. There was no association between surgical subspecialty and the level of knowledge. Doctors were more aware than nurses about epidemiological part questions. Age of Surgical Staff was associated with and level of knowledge.

Conclusion: Level of knowledge among Surgical Staff needs reinforcement on a larger scale thus we recommend proper awareness courses regarding SSI.

Background

Surgical site infection (SSI) is a serious complication following surgery and it is described as a microbial infection of the surgical wound during 30 days of any procedure or within 1 year after operation [1]. SSI account for 2% of surgical procedures complications and significantly results in increasing the mortality, morbidity and financial cost [2]. A study in the United States(US) showed that the incidence of SSI is 1.07% [3] however a study in the United Kingdom(UK) showed that the prevalence of SSI accounted for 14.5% [4].

Death, length of stay at hospital readmission and financial cost are increased with the incidence of surgical site infection and it is affected by many factors. A study in the US show the number of death due to SSI was 8000 [3] as well there is another study about the Surgical site infections evaluated the annual financial is more than 3 billion dollars countrywide and it considers as the largest contributor cost in the healthcare-associated infections [5].

(SSI) can be prevented or reduced by many methods which could decrease the costs and are highly effective as surgical scrubbing, nutritional support, preoperative bathing, mechanical bowel preparation, use of oral antibiotics, hair removal, and surgical site skin preparation and this can be achieved simply by medical awareness [6].

Every year more than 2-3 million Muslims from different countries come to Makkah for the hajj season which represent one of the largest mass gathering events worldwide. Therefore, during Hajj overcrowding, high temperature, and traveling may increase the risk of infection [7-9].

In 2017 more than 1,600 surgeries and procedures were performed during hajj including 218 cardiac catheterizations, 11 open-heart surgery, 983 hemodialysis, and 904 other surgeries [10]. The high proportion in pilgrims that makes the probability of infection very high and that makes a lot of patients come to the surgical wards and a lot of surgeries to be done and all of those factors have a direct effect on the awareness of surgical sites infection. There are several studies about the level of knowledge of SSI around the world, but there is no published studies reported the SSI rate in Makkah especially during the Hajj season. King Abdullah medical city (KAMC) is a tertiary health care center. Hence, KAMC staff are dealing with immunosuppressed patients, such as cardiac patients, cancer patients, and old patients who are more vulnerable to infections. This indicates the importance of staff awareness about SSI, especially during hajj. Therefore, this study aimed to assess the level of knowledge about SSI among medical staff in KAMC those who participate in the Hajj season.

Methods

A cross-sectional study conducted to assess the awareness and level of knowledge of surgical site infection among surgical staff in King Abdullah Medical City those who had been participating in healthcare provider team of Hajj season of 2019 using a 20-item anonymous multiple-choice SurveyMonkey questionnaire that previously validated in a study conducted in King Abdulaziz university hospital – Jeddah in 2018 [1]. The questionnaire contains two segments, The first segment include staff demographics such as age, gender, Rank (Consultant Specialist, Resident, Intern or Nurse) Years of experience and Specialty plus a yes/no question about participating in healthcare provider team of Hajj season of 2019, and the second segment includes 20 multiple-choice questions about the definition, epidemiology and management of SSI. Participants were categorized as having good knowledge (for $\geq 80\%$ correct answers), fair knowledge (for 50%-79% correct answers), and poor knowledge (for $< 50\%$ correct answers). To avoid selection bias, we emailed the questionnaire to all staff of all surgical departments currently working and employed in King Abdullah Medical City include consultants, specialists, residents, interns and nurses. Of 435 individuals asked to fill the questionnaire via emails, 210 responded and filled the questionnaire, 86 of them participate in Hajj season 2019 and were included in our study, the remain 114 have not participate in Hajj season 2019 and were excluded. Consent had been taken from the questionnaire owners to be use in this study and citation was preserved. The data were analyzed using SPSS version 21 and we applied chi-square and independent sample tests to analyze the data.

Ethical approval for this study obtained from Institutional review board (IRB) of the King Abdullah Medical City.

Results

A total of 86 responses were taken for this study. Among all respondents, 46 (53.5%, 46/86) were doctors and forty (46.5%, 40/86) were nurses. Figure 1. Of 86 respondents 12(14%) were consultants, 12 (14%) were specialist, 12 (14%) were residents and 10 (11.6%) were intern., 42 (48.4%) were male and 44 (51.2%) were female. In general, among 86 respondents, only 12 (14%) had high knowledge, 43(50%) had fair knowledge, 31(36%) had poor knowledge regarding SSI according to this study.

Among all respondents who knew the definition of SSI according to the CDC, only 10 (11.6%, 10/86) had high knowledge, eight were doctors and two were nurses. Moreover, twenty of them (23.3%, 20/86) had fair knowledge, eleven were doctors and nine were nurses. The remaining had poor knowledge (65.1% (56/86)) as 27 were doctors and 29 were nurses. However, more than half of male respondents found to have poor knowledge 28 (66.6%, 28/42) and an equal number of them have fair and high knowledge, 7 (16.6%) for each category. Among all female participants three out of forty-four had high knowledge (6.81%). Similar to males, most of the female respondents found to have poor knowledge about the definition of SSI, 28/44 (64%). The remaining had a fair knowledge (30%). Out of 86 respondents, 65 have had 10-year experience or less, only four have high knowledge (6%). Thirteen out of sixty-five (20%) and (74%) had fair and poor knowledge respectively, the remaining respondents which had more than 11 years of experience (n=21) were found to have high knowledge in 6/21 (29%), the other had fair and poor knowledge in 33% and 39% respectively (Table1).

Respondents n=86	Gender		Rank		experience	
	Male (n=42)	Female (n=44)	Doctors (n=46)	Nurse (n=40)	Less 10Y (n=65)	More 11Y (n=21)
high	7	3	8	2	4	6
Fair	7	13	11	9	13	7
poor	28	28	27	29	48	8

Table 1: Knowledge of definition of SSI

Among all respondents who knew the concept of epidemiology for SSI according to the US CDC. Most of them (45.3%, 39/86) had poor knowledge, 16 were doctors and 23 were nurses. Only 18 (20.9%, 18/86) had high knowledge, 11 were doctors and 7 were nurses. The remaining participants had fair knowledge (33.7%, 29/86) from which 19 were doctors and 10 were nurses. However, more than half of male respondents were found to have poor knowledge (47.6%, 20/42), and an equal number of them have fair and high knowledge (26.2 %) for each category. Among all female participants 7/44 had high knowledge (16%). Similar to males, most of the female respondents found to have poor knowledge about the

epidemiology of SSI, 19/44 (43%). The remaining had a fair knowledge among 41% (18/44). Out of 86 respondents, 65 have had 10 years' experience or less, only 13 had high knowledge (20%). 23 out of 65 (35.3 %) and 29/65 (44.6%) had fair and poor knowledge respectively, the remaining respondents which had more than 11 years' experience (n=21), found to have high knowledge in 5/21 (23.8%), the other had fair and poor knowledge in 29% and 48% respectively (Table 2).

Respondents n=86	Gender		Rank		experience	
	Male (n=42)	Female (n=44)	Doctors (n=46)	Nurse (n=40)	Less 10Y (n=65)	More 11Y (n=21)
high	11	7	11	7	13	5
Fair	11	18	19	10	23	6
poor	20	19	16	23	29	10

Table 2: Concept of epidemiology for SSI

Most of the respondents who knew How to manage cases of SSI according to the US CDC (60.5% 52/86) had poor knowledge, 25 were doctors and 27 were nurses. Only 14 (16.3%, 14/86) had high knowledge, 13 were doctors and only one nurse. The remaining participants were had fair knowledge (23.3%, 20/86) from which eight were doctors and 12 were nurses. However, more than half of male and female nurse respondents 24 (57%, 24/42), and 28 (64%, 28/44) respectively were found to have poor knowledge. Seven female participants (16%) and seven male (7/42) participants (17%) had high knowledge. The remaining had a fair knowledge among 26% of males (11/42) and 20% of female participants (9/44). Only 8 out of 65 who had 10 years' experience or less were found to have high knowledge (12%) followed by 13/65 (20 %) and 44/65 (68%) had fair and poor knowledge respectively. The remaining respondents who had more than 11 years' experience (n=21) were found to have high knowledge in 6/21 (29%), the other had fair and poor knowledge in 33% and 38% respectively (Table 3).

Respondents n=86	Gender		Rank		experience	
	Male (n=42)	Female (n=44)	Doctors (n=46)	Nurse (n=40)	Less 10Y (n=65)	More 11Y (n=21)
High	7	7	11	7	8	6
Fair	11	9	19	10	13	7
poor	24	28	16	23	44	8

Table 3: management of SSI

Discussion

Many studies have issued the knowledge and awareness toward SSI but most of the studies were conducted among nurses not doctors. Nurses have a avital role in prevention of SSI however the medical stuff including specialists, residents and consultants play a critical role in patient care thus this study involved doctors and nurses. The low level of knowledge could be involved with the increasing the number of morbidities and mortalities due to SSI [11, 12].

In the present study about 39.2% of respondents had poor knowledge while only 13.7% had good knowledge and the rest had fair knowledge. The results of our study are in consistent with another study conducted in Saudi Arabia(SA) showing low level of knowledge was found among 119 doctors including intern doctors, resident doctors, and specialist doctors. This study showed that most of the doctors had fair or poor knowledge regarding the definition, incidence, prevention of SSI [6].

Also, the same results were found among doctors showing that almost more than half of the participants didn't attend SSI prevention training courses and their knowledge was poor even among doctors or nurses [13]. Also, this study showed that the doctors showed higher level of knowledge more than nurses which is in the same pattern with the present study [13].

Other studies in western countries and in Africa as well showed that the level of knowledge was inadequate on prevention of SSI [14-16].Also, in Italy, the level of knowledge among surgical ward nurses was poor and was associated with low performance and low preventive measures [17].

Older age and higher years of experience are associated with high SSI awareness and knowledge which was shown in another study among nurses indicating that years of experience also were significantly related to the nurse's awareness and practice pattern in preventing SSI [18]. This could be attributed to the higher years of working would give more experience and increase their level of practice thus improving their knowledge.

This study has some limitations including that it only measures the awareness of the participants but don't measure their practice pattern or give them a handout or a course after finishing the questionnaire to improve their knowledge.

Conclusions And Recommendations

Awareness and level of knowledge regard SSI among surgical staff is low therefore we recommend to improve their knowledge of SSI by providing them more courses and session, provide training programs for the new doctors and nurses which can improve the knowledge and awareness of SSI which in turn would decrease the length of hospital stay, economic costs, morbidity and mortality rate because of SSI.

List Of Abbreviations

SSI:Surgical site infection; KAMC:King Abdullah Medical City; IRB:Institutional review board; US:United states; CDC:Central for Disease Control and Prevention; SA:Saudi Arabia

Declarations

Ethics approval and consent to participate

The study was approved by King Abdullah Medical City IRB registered at the National BioMedical Ethics committee, King Abdulaziz City for Science and Technology. Web-based consent was obtained from participants

Consent for publication

Not applicable

Availability of data and materials

The datasets analyzed during the current study are available on this manuscript

Competing interests

The authors declare that they have no competing interests

Funding

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Authors participation

SA and AB did the SurveyMonkey form. KI and RA analysed the data participants. EB and GF worked on the citation and were a major contributor in the manuscript writing. AA had a major role in revising the data language of the manuscript. All authors contributed in manuscript writing and all read the final manuscript and approved it. All authors participated in the literature review and proposal writing.

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Footnote

Conflicts of interest: None declared

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Figures

Figure 1

Distribution of all respondents by their position (n=86).