Surgical site Infection in post-operative cases at a District Hospital of Rajasthan, India

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Abstract*—Surgical site infection is a post-operative complication. In spite of use of modern days antibiotics post-operative wound may get infected which is a negative sign of quality care of wound post-operatively. There are many factors associated with SSI. So this present study was conducted to find out prevalence of Surgical site infection in post-operative cases operated at R.K. Joshi District hospital Dausa (Rajasthan) India in year 2017. Surgical site infection was found in 25.6% of post operative cases. It was found significantly more in older age group, in cases from rural areas and cases from BPL families. Sex of cases was not found to associated with prevalence of SSI. SSI was found significantly more in Appendicectomy and Cholecystectomy than other surgeries. SSI was also found significantly more where duration of surgery was more. Cases with SSI had significantly longer duration of hospital stay. It was also revealed that cases with co morbidities were having significantly higher proportion of SSI. Among co morbidities SSI was highest in cases with Diabetes Mellitus*

Keywords: Surgical Site Infection(SSI), Post-Operative Complication

I. INTRODUCTION

Surgical site infection is infection at the site of surgical incision for any operative procedure and the site of the infection may be limited to the suture line or may extend into the operative site.

SSI is one of the most common post-operative complications and causes significant post-operative morbidity and mortality. While the global estimates of SSI have varied from 0.5% to 15%, studies in India have consistently shown higher rates ranging from 23% to 38%.[1] Surgical wound infection is a type of nosocomial infection.[2] Surgical site infections (SSI) are the third most commonly reported nosocomial infection and they account for approximately a quarter of all nosocomial infections.[3] These infections account for 20% to 39% of all the infections acquired in hospitals.[4] Postoperative wound infection can occur from the first day onwards to many years after an operation but commonly occurs between the fifth and tenth days after surgery.[5]

Wound infection is the commonest and most troublesome disorder delaying wound healing thus may increase the hospital stay of patients. It affect morbidity and mortality of post-operative cases. In cases of deep or extensive infection this resulted in a mortality rate of 70-80%.[6]

Furthermore, SSIs cause an increase in treatment cost, bed occupancy in a ward and prolong the hospital stay of the patient. Even basic life-saving procedures like appendectomies and cesarean sections are associated with high infection rates of wounds and mortality.[7] In developing countries, due to limited resources it poses much more problem, so this present study was designed to find out the prevalence of surgical site infection in a secondary care hospital of Rajasthan

II. METHODOLOGY

This case series type of observational study was conducted on post-operative cases admitted and operated Department of Surgery of R.K. Joshi District Hospital, Dausa (Rajasthan) India.

Sample size was calculated 345 subjects at 95% confidence limit and 5% absolute allowable error expecting 34% surgical site infection rate in post-operative cases. For study purpose 500 post-operative cases were observed for surgical site infection.

Data collection was started from 22nd March 2017 from each of the case operated for major surgeries after taking consent from the subjects. Data were collected regarding socio-demographic information, type of surgery done whether in emergency or in routine. These cases were followed for 30 days. If any case having operated site infection within 30 days of surgery was considered surgical site infection.

Data thus collected were compiled in the form of master chart in Microsoft Excel 2010. Qualitative data were expressed in percentage and proportion and quantitative dat were expressed in means with standard deviation. Association was find out with Chi-square test in qualitative data and Unpaired 't' test in quantitative data.

III. RESULTS

Out of 500 post-operative cases, 287 (57.4%) were male and 213 (42.6%) were female with Male: Female ratio 1.35. Among these cases 248 (49.6%) were from urban areas and 252 (50.4%) were from rural areas. Out of these 500 post-operative cases, 163 (32.6%) were from below poverty line (BPL). Mean age of cases was 46 years and mean duration of hospital stay was 9 days. (Table 1).

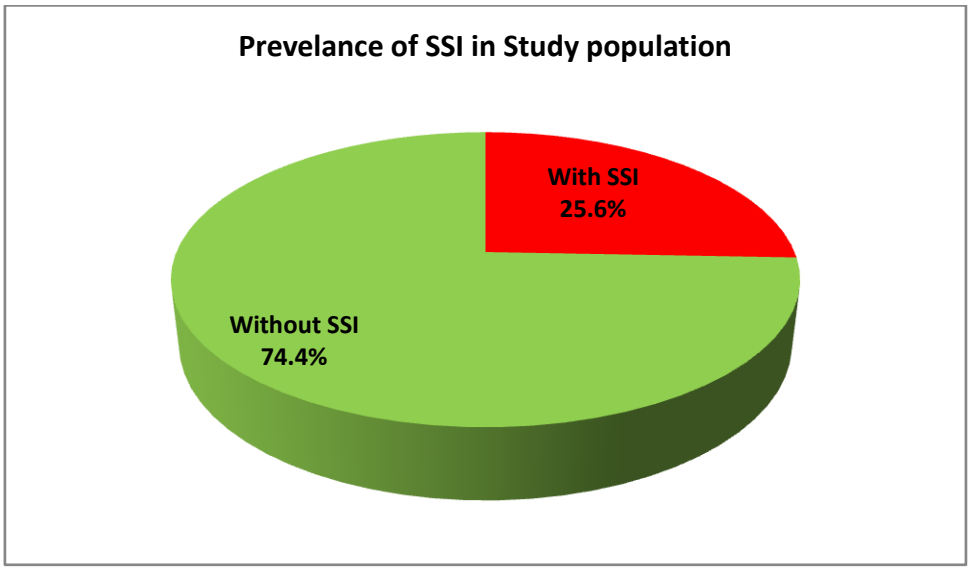
Out of these 500 surgeries, 46.2% were elective otherwise 53.8% were done in emergency. Maximum surgeries were Hysterectomy (30.6%) followed by Appendicectomy, Hernia, Hydrocoele etc. (Table 1)

Table 1
Characteristics of Study population

S. No.	Variables		Number	Percentage
1	**Sex**	**Male**	287	57.4
		Female	213	42.6
2	**Residence**	**Urban**	248	49.6
		Rural	252	50.4
3	**BPL Status**	**Yes**	163	32.6
		No	337	67.4
4	**Type of Surgery (Period)**	**Elective**	231	46.2
		Emergency	269	53.8
5	**Type of Surgery (Organ)**	**Appendicectomy**	120	24
		Hysterectomy	153	30.6
		Hernia	110	22
		Hydrocoele	69	13.8
		Cholecystectomy	40	8
		Other	30	6

Out of these 500 post-operative cases, 128 (25.6%) had surgical site infection (SSI). (Figure 1)

Figure 1



When association of SSI with various socio-demographic factors was evaluated it was observed that SSI were significantly more in older age group, in cases from rural areas and cases from BPL families. However sex of cases was not found to associated with prevalence of SSI. (Table 2).

Table 2
Association of socio-demographic factors with SSI

S. No.	Variables		With SSI N=128	Without SSI N=372	P Value LS
1	Age (Mean ± SD) in years		54.5±6	43±9	<0.001 S*
2	Sex	Male	71	216	0.683 S**
		Female	57	156	
3	Residence	Urban	50	198	0.008 S**
		Rural	78	174	
4	BPL Status	Yes	53	110	0.019 S**
		No	75	262	

***Unpaired 't' test** ****Chi-square Test**

On further analysis however proportion of SSI was more in emergency cases than elective cases but it was not found significant. SSI was found significantly more in Appendicectomy and Cholecystectomy than other surgeries. SSI was also found significantly more where duration of surgery was more. Cases with SSI had significantly longer duration of hospital stay. (Table 3).

Table 3
Association of variables related to surgery with SSI

S. No.	Variables		With SSI N=128	Without SSI N=372	P Value LS
1	Type of Surgery (Period)	Elective	52	179	0.173 S**
		Emergency	76	193	
2	Type of Surgery (Organ)	Appendicectomy	57	63	<0.001 S**
		Hysterectomy	30	123	
		Hernia	2	108	
		Hydrocoele	0	69	
		Cholecystectomy	21	19	
		Other	18	12	
3	Duration of Surgery (Mean ± SD) in Hrs		2.2±1.1	1.8±1.3	0.002 S*
4	Hospital Stay (Mean ± SD) in Days		12±4	7±2	<0.001 S*

***Unpaired 't' test** ****Chi-square Test**

It was also revealed that cases with co morbidities were having significantly higher proportion of SSI. Among co morbidities SSI was highest in cases with Diabetes Mellitus. (Table 4).

Table 4
Association of co morbidities with SSI

S. No.	Variables		With SSI N=128	Without SSI N=372	P Value LS
1	Associated Co morbidity	Yes	68	63	<0.001 S**
		No	60	309	
2	Type of Morbidity*	Diabetes	56	12	<0.001 S**
		Renal Diseases	0	6	
		CVS Diseases	4	18	
		Respiratory	12	21	
		Other	6	13	

***Multiple response** ****Chi-square Test**

IV. DISCUSSION

In present study, surgical site infections (SSI) were found in 25.6% of post operated cases. In India it has a very variable response depending upon type of hospital, type of surgery, type of wound etc. A study conducted at the Department of General Surgery, RIMS revealed rate of SSI as 12.5% in elective surgeries and 17.7% in emergency surgeries.[8] Another study conducted at Department of Obstetrics and Gynecology in the Chandrikaben Rashmikant Gardi Hospital (CRGH), which is situated in a rural area of Madhya Pradesh in India, reported incidence rate of SSI 7.84%.[9] However, SSI rate was found to be 33.68% in another study.[10]

It was also observed in present study that SSI were significantly more in older age group, in cases from rural areas and cases from BPL families. However sex of cases was not found to associated with prevalence of SSI. Farhan at all[10] also found that rate of SSIs was greater in older patients but they reported higher incidence rate (52.77%) of SSIs in urban areas as compared to rural areas (32.20%).

In alignment of the present study, Bernard etall[11]also found higher incidence of SSI with increasing age of the patient but such a difference was not noted between the two sexes. Ashish etall[9] also reported that patients older than 40 years of age were more likely to have an SSI than those between 25 and 40 year of age (OR 2.95; vs. 2.19); as compared to those less than 25 years of age.[9]

Present study also revealed that however proportion of SSI was more in emergency cases than elective cases but it was not found significant. Ferhan et all[10] also reported rate of SSIs in patients operated with an elective surgical plan was greater (37.93%) as compared to patients operated with an emergency surgical plan (27.77%). This is in accordance to previously reported studied wherein emergency surgeries have shown higher rate of SSI.[12-15]

In present study SSI was found significantly more in Appendicectomy and Cholecystectomy than other surgeries. Almost similar observations were found by Kumar A etall[8] who reported that exploratory laparotomy (34%) was the procedure most commonly associated with SSI followed by colon surgery (21%) and appendectomy (16%). Hernia repair (3%) and Hepato-pancreatico-biliary surgery (4%) were least commonly associated with SSI.

Present study also observed that SSI were also found significantly more where duration of surgery was more. Bernard F etall[11] also reported more incidence of SSI with prolonged duration of surgery.

Present study also found more cases with more duration of hospital stay. Ashish etall[9] reported that each day increase in stay in the hospital after the surgery increased the risk of contacting an SSI by 5% .

It was also revealed in present study that cases with co morbidities were having significantly higher proportion of SSI. Among co morbidities SSI was highest in cases with Diabetes Mellitus. Farhan Sattar atall[10] observed that 66% of diabetics developed SSIs. Bernard etall[11] also reported diabetes as predisposing factor for SSI. Akhtar etall[16] also observed diabetes as risk factors associated with a higher incidence of SSIs were found to be age (>55 years)

V. CONCLUSION

Surgical site infection was found in 25.6% of cases. This SSI was found to be associated with age, residence, BPL status, type of surgery and duration of surgery. SSI was found more in cases with co morbidity specially with Diabetes Mellitus.

CONFLICT OF INTEREST

None declared till now.

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