

RISK FACTORS FOR SURGICAL SITE INFECTIONS IN MAJOR GYNAECOLOGICAL ABDOMINAL OPERATIONS

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Introduction

- Surgical site infection (SSI) is a type of health care associated infection occurs after an invasive (surgical) procedure (NICE, 2008).
- Based on National Nosocomial Infection Surveillance (NNIS) system reports, SSIs are the third most frequently reported nosocomial infection, accounting for 14% to 16% of all nosocomial infections among hospitalized patients (Emori and Gaynes, 1993).
- It is an important cause of illness resulting in a prolongation of hospital stay, increased trauma care and treatment costs.

Introduction

- Among surgical site infections, two thirds were confined to the incision and one third involved organs or spaces assessed during the operation (Mangram *et al.*, 1999).
- Although surgical site infection is a preventable condition, it continues to be a major problem worldwide.
- Globally, surgical site infection rates have been reported to range from 2.5% to 41.9%.

Aim

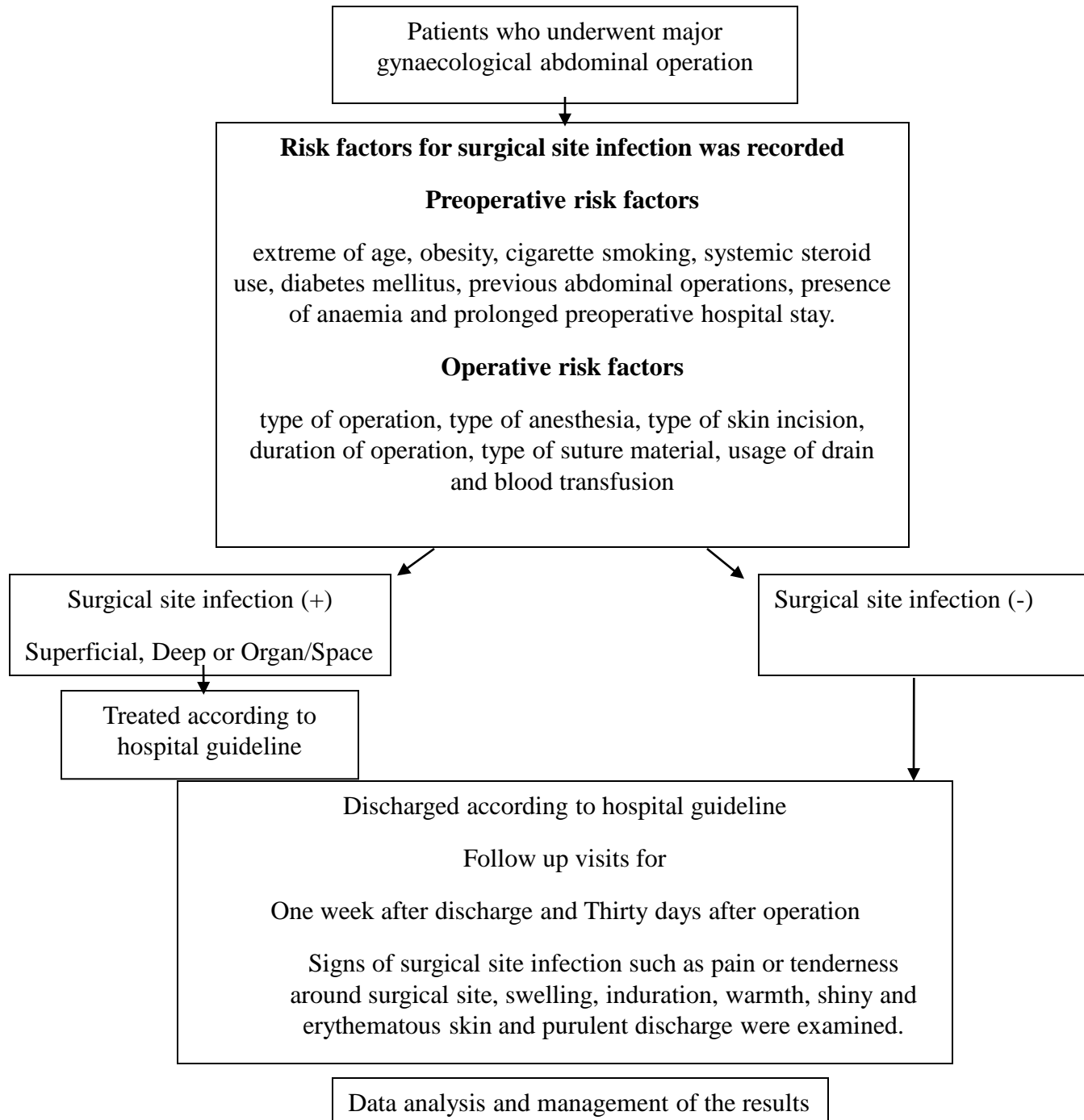
- To study the risk factors for surgical site infections in major gynaecological abdominal operations

Objectives

- To identify the socio-demographic characteristics of the study population
- To find out the proportion of surgical site infections following major gynaecological abdominal operations
- To study the preoperative and operative risk factors that influence surgical site infections in major gynaecological abdominal operations

Methods

- This study was longitudinal hospital based descriptive study.
- One hundred consecutive patients who underwent major gynaecological abdominal operations in North Okkalapa General and Teaching Hospital from January to December 2015 were included.



Results

- In the present study, surgical site infection occurred in 33 out of 100 cases studied and the overall surgical site infection rate was 33%.

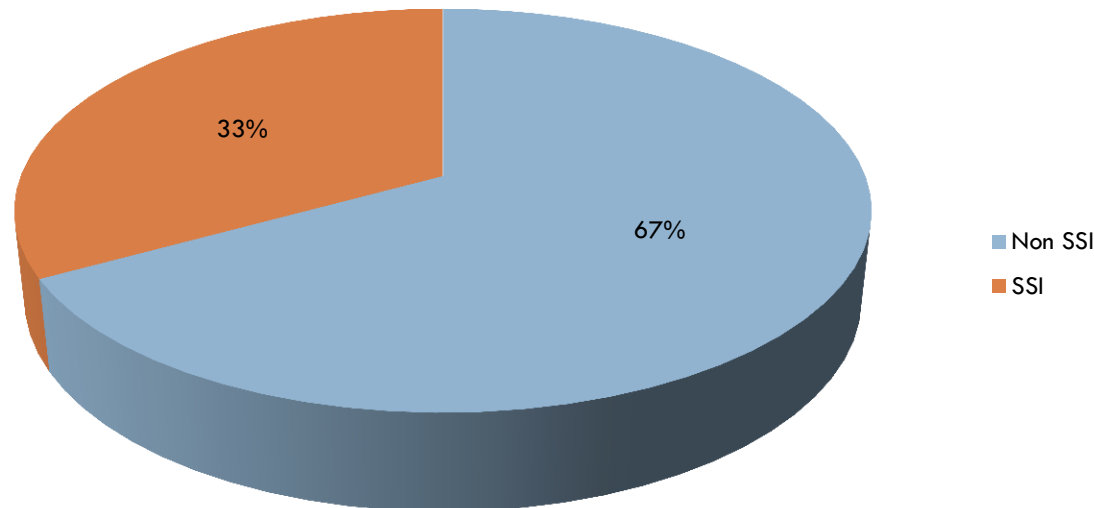


Figure 1. Proportion of surgical site infection following major gynaecological abdominal operations

Table 1. Proportion of surgical site infection according to Age

Age (years)	Infection				χ^2	p
	Yes		No			
	Number	%	Number	%		
≤ 30	4	22.00%	14	78.00%	3.079	0.215
31-50	21	31.81%	45	68.19%		
> 50	8	50.00%	8	50.00%		

Table 2. Proportion of surgical site infection according to Marital Status

Marital status	Infection				χ^2	p
	Yes		No			
	Number	%	Number	%		
Married	29	36.70%	50	63.30%	2.340	0.126
Unmarried	4	19.04%	17	80.96%		

Table 3. Proportion of surgical site infection according to Educational level

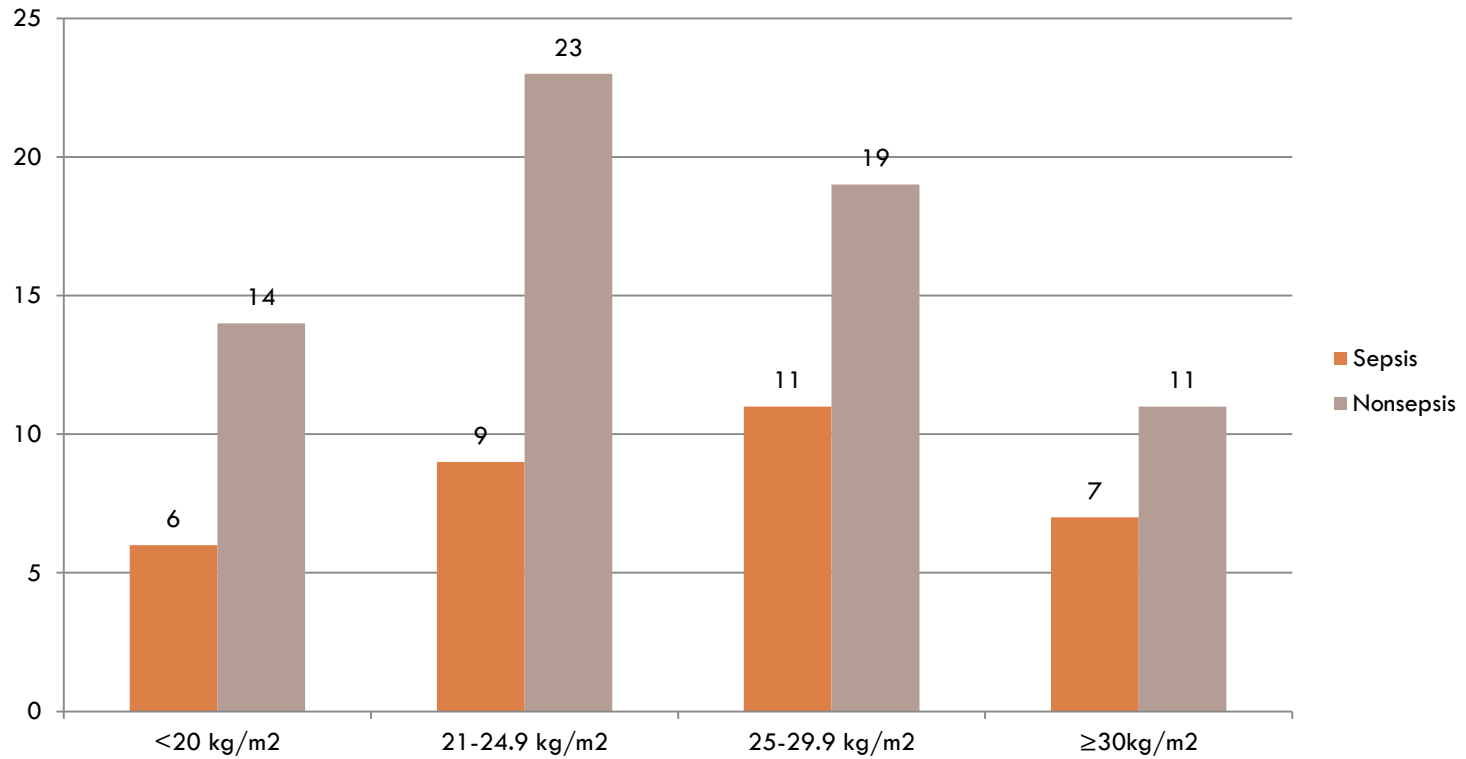
Educational level	Infection				χ^2	p
	Yes		No			
	Number	%	Number	%		
Illiterate / Read and write	8	88.88%	1	11.12%	15.921	0.003
Primary School Level	7	33.33%	14	66.67%		
Middle School Level	9	60.61%	17	39.39%		
High School Level	6	21.42%	22	78.58%		
Graduate	3	23.07%	13	76.93%		

Table 4. Proportion of surgical site infection according to Occupation

Occupation	Infection				χ^2	p
	Yes		No			
	Number	%	Number	%		
Dependent	14	41.18%	20	58.82%	1.558	0.212
Others	19	28.78%	47	71.22%		

Table 5. Proportion of surgical site infection according to Income

Income (Kyats/ month)	Infection				χ^2	p
	Yes		No			
	Number	%	Number	%		
< 100000	21	45.65%	25	54.35%	6.167	0.013
>100000	12	22.22%	42	77.78%		



Chi-square = 0.890,

p = 0.828

Figure 2. Proportion of surgical site infection according to BMI

Table 6. Proportion of surgical site infection according to history of previous abdominal operation

Previous abdominal operation	Infection				χ^2	p
	Yes		No			
	Number	%	Number	%		
Yes	9	56.25%	7	43.75%	4.659	0.031
No	24	28.57%	60	71.43%		

Table 7. Proportion of surgical site infection according to type of surgical procedure

Procedure	Infection			
	Yes		No	
	Number	%	Number	%
TAH + BSO	7	29.17%	17	70.83%
Exploratory laparotomy	11	61.11%	7	38.89%
Ovariectomy	8	30.77%	18	69.23%
TAH	1	9.09%	10	90.91%
Myomectomy	1	25.00%	3	75.00%
Salpingectomy	2	28.57%	5	71.43%
Wertheim's hysterectomy	1	33.33%	2	66.67%
Debulking surgery	2	50.00%	2	50.00%
Peritoneal toilet	0	0.00%	3	100.00%

Table 8. Proportion of surgical site infection according to type of anaesthesia

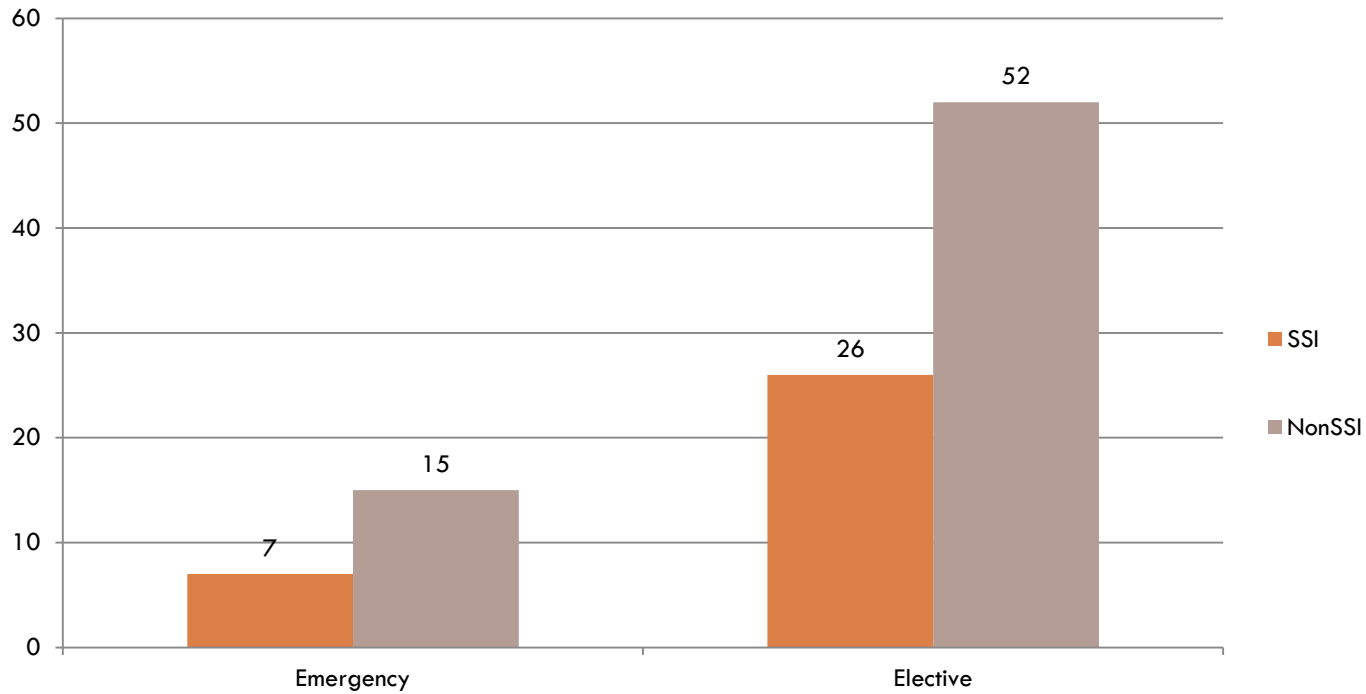
Type of anaesthesia	Infection				χ^2	p
	Yes		No			
	Number	%	Number	%		
GA	2	16.70%	10	83.30%	2.604	0.272
Spinal	21	32.31%	44	67.69%		
CSE	10	43.47%	13	56.53%		

Table 9. Proportion of surgical site infection according to type of skin incision

Type of skin incision	Infection				χ^2	p
	Yes		No			
	Number	%	Number	%		
Right lower paramedian	11	37.93%	18	62.07%	15.14	0.001
Midline	15	60.00%	10	40.00%		
Pfannenstiel	7	15.21%	39	84.79%		

Table 10. Proportion of surgical site infection according to duration of operation (minutes)

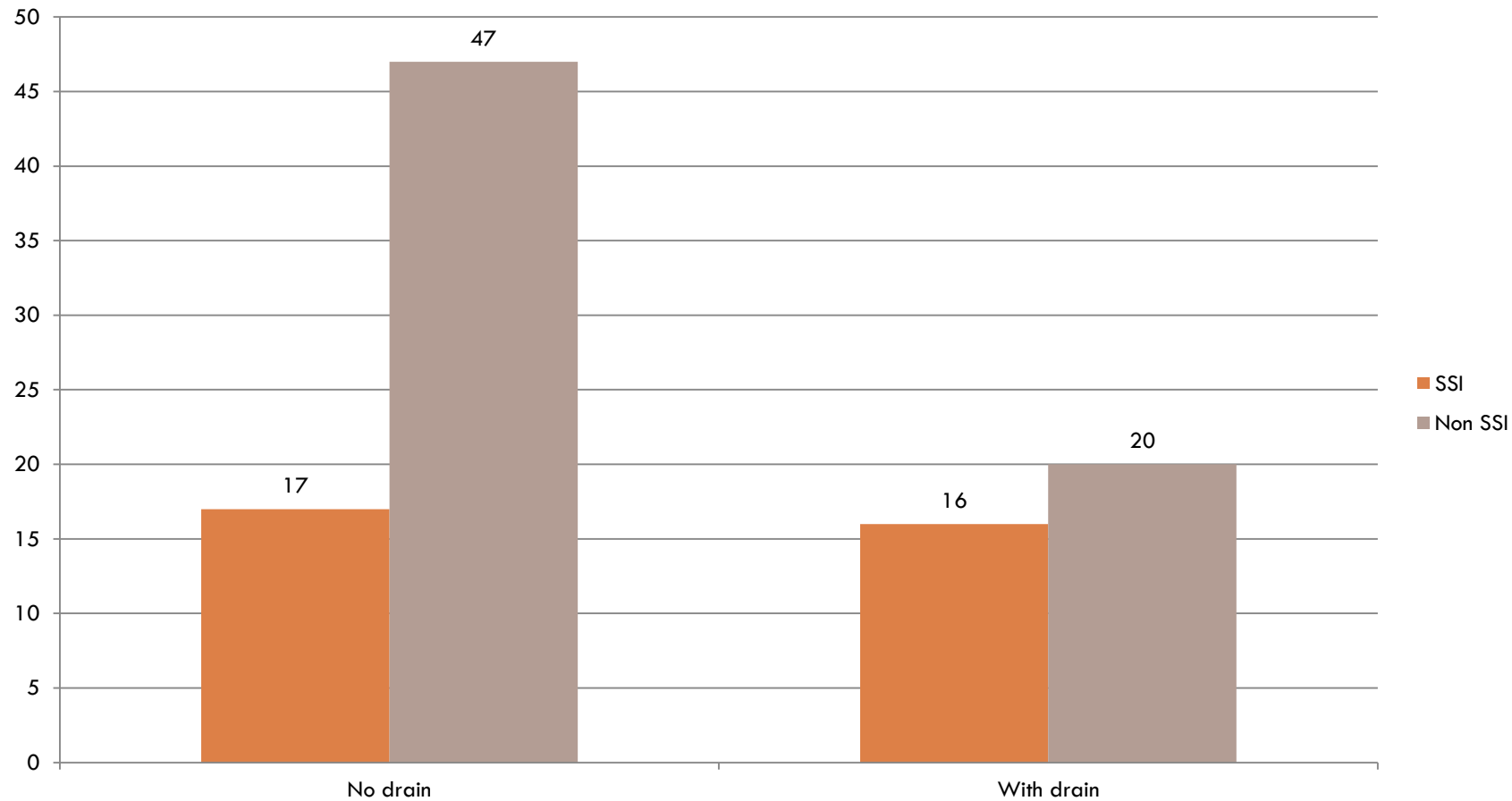
Duration of operation (minutes)	Infection				χ^2	p
	Yes		No			
	No.	%	No.	%		
30 - 60	7	24.13%	22	75.87%	6.669	0.083
61 - 120	15	29.41%	36	70.59%		
121-180	10	52.63%	9	47.37%		
>180	1	100.00%	0	0.00%		



Chi-square = 0.018,

p = 0.894

Figure 3. Proportion of surgical site infection according to elective and emergency major gynaecological abdominal operation



Chi-square = 3.332,

p = 0.068

Figure 4. Proportion of surgical site infection according to use of abdominal drain

Table 11. Proportion of surgical site infection according to use of suture material for rectus sheath

Suture material for rectus sheath	Infection				χ^2	p
	Yes		No			
	No.	%	No.	%		
Prolene	20	46.51%	23	53.49%	6.229	0.013
Vicryl	13	22.80%	44	77.20%		

Table 12. Proportion of surgical site infection according to use of suture material for subcutaneous fat

Suture material for subcutaneous fat	Infection				χ^2	p
	Yes		No			
	No.	%	No.	%		
Plain catgut	15	53.57%	13	46.43%	7.443	0.006
Vicryl	18	25.00%	54	75.00%		

Table 13. Proportion of surgical site infection according to use of suture material for skin

Suture material for skin	Infection				χ^2	p
	Yes		No			
	No.	%	No.	%		
Silk	13	50.00%	13	50.00%	11.62	0.009
Vicryl	16	23.19%	53	76.81%		
Nylon	1	100.00%	0	0.00%		
Prolene	3	75.00%	1	25.00%		

Table 14. Proportion of surgical site infection according to use of suture material for skin

Blood Transfusion	Infection				χ^2	p
	Yes		No			
	No.	%	No.	%		
Yes	17	34.69%	32	65.31%	0.123	0.724
No	16	31.37%	35	68.63%		

Table 15. Proportion of surgical site infection according to preoperative hospital stay

	Surgical site infection	Number	Mean	SD	t test	p
Preop hospital stay (days)	Yes	33	6.06	4.81	0.117	0.907
	No	67	5.92	5.67		

Table 16. Types of treatment required for surgical site infection

Treatment	Number	%
Antibiotic only	17	51.51%
Secondary suture	16	48.49%
Relaparotomy	0	0.00%

Discussion

- In the present study, the proportion of SSI following major gynaecological abdominal operations was 33.0% and there was only superficial surgical site infection.
- Globally, surgical site infection rates have been reported to range from 2.5% to 41.9%.
- In 2009, the study of abdominal wound sepsis following major gynaecological surgery in NOGTH by Zin Zin Kyaw, the overall post-operative wound infection rate was 8.26%.

Discussion

- ❑ In the present study, SSI was increased compared to Zin Zin Kyaw study.
- ❑ It was because of different in sampling procedure and study population.
- ❑ In the present study, data were collected from 100 consecutive patients and looking for SSI up to 30 days after operation.
- ❑ According to Zin Zin Kyaw, the study was done on 351 operated cases for one year duration and follow up was only to the time of discharge.

Discussion

- In the present study, the patients were divided into three age group; ≤ 30 years, 31-50 years and >50 years.
- The highest rate of surgical site infection was found in >50 years age group (50.0%).
- The finding was consistent with other studies.

Discussion

- In the present study, surgical site infection was higher in low education than high education level.
- Patient's education level influence the patient's health knowledge and attitude to reduce SSI.
- Better knowledge of health-related behaviors and self-care is likely to reduce the SSI rate.

Discussion

- BMI is commonly used to define obesity and studies suggested that obesity is an independent predictor of surgical site infection.
- In this study surgical site infection was highest in BMI of ≥ 30 kg/m² (38.9%) which was consistent with Hansa *et al* (2013), stated that surgical site infection was higher in obese patient with BMI of 30 or more.

Discussion

- In the present study, surgical site infection was highest in exploratory laparotomy cases (61.1%), followed by debulking surgery (50.0%), and Werthiem's hysterectomy cases (33.3%) because these procedures were extensive and had longer duration of operation, greater chance of blood loss in addition to malignant condition in which these procedures were performed.

Discussion

- In the present study, surgical site infection was highest in patients who underwent operation under combined spinal and epidural anesthesia CSE (43.5%).
- This may be due to most of the cases performed under CSE were extensive surgical procedures and took longer operation time and maximum tissue handling although the procedures were done by an experienced surgeon.

Discussion

- In the present study, the rate of surgical site infection was higher in midline and right lower paramedian incision than pfannenstiel incision and it was consistent with the study of Aye -Aye-Tint (1995).

Discussion

- In the present study, surgical site infection rate was increased with increased duration of operation and the findings were similar to the study of Saw-Gwa-Lar (2009), the study on postoperative wound infection in elective laparotomy.

Discussion

- In the present study, among 100 cases, 36 patients required drainage tube insertion. Sixteen out of 36 patients (44.44%) got surgical site infection. No drain was inserted in 64 patients, 17 out of 64 patients (26.56%) got surgical site infection. Surgical site infection was increased in patients with drainage tube insertion.
- The finding was in agreement with the finding of Zin-Zin-Kyaw (2009), the infection rate was also higher in those who used drain (21.74%) than who did not use drain (3.47%).

Discussion

- In the present study, suture material use was studied separately for rectus sheath, subcutaneous fat and skin.
- In all layers vicryl use had less SSI than other suture materials.
- There was an evidence for the use of vicry suture which reduce the SSI in the present study.

Discussion

- In the present study, 34.69% of patients who received blood transfusion and 31.37% who didn't received blood transfusion got surgical site infection.
- Surgical site infection was slightly increased in patient with blood transfusion.

Discussion

- In the present study, surgical site infection was higher in patients with prolonged preoperative hospital stay.
- Prolonged preoperative duration of hospitalization with exposure to hospital environment is associated with increased rate of surgical site infection.
- According to Brain *et al* (2011), hospitalization of more than 7 days prior to surgery increased the risk of SSI by two fold.

Conclusion

- Measures should be taken in the pre-, intra- and post-operative phases to reduce the risk of surgical site infection.
- In the preoperative phase, prolong preoperative hospital stay should be avoided if possible to avoid nosocomial infections and bathing should be encouraged on the day of surgery.
- Intra-operative infection prevention can be aided by unnecessary use of drain, blood transfusion and one of the latest practices worldwide which is the use of monofilament sutures.

Conclusion

- In the present study, SSI rate was lowest in the patient whose abdomen was sutured with vicryl in all layers.
- The use of subcuticular sutures buried in the wound is also very unlikely to cause infection.
- Postoperative surgical infection can be reduced by rigorous surgical technique, early mobilization, bathing and adequate nutrition.
- Early detection, timely and appropriate management of surgical site infection can reduce morbidity as it is not extended to deep or organ/space infection.

Conclusion

- Infection rates are one standard for judging a hospital's quality and lowering them can reduce cost at a time.
- By applying the findings of this study, it is hoped that surgical site infection may be reduced considerably in near future.

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THANK YOU

