

EVALUATION OF PATIENTS' RISK FACTORS FOR SURGICAL SITE INFECTIONS FOLLOWING SURGERY FOR GYNECOLOGIC CANCERS

Helmy Helmy Abd El-Sattar Rady, Hossam Hassan Elsokkary, Eman Saad Nassar,* Mohamed Mourad Aly,** Mai Mofreh Abdel Fattah Beppars

Department of Obstetrics and Gynecology, Department of Clinical and Chemical Pathology,* Department of Surgery,** Faculty of Medicine, University of Alexandria.

Introduction

Gynecologic cancers (GC) are among the most prevalent malignancies affecting women globally. Among the most common cancers, endometrial, ovarian, and cervical cancers account for almost one-third of all newly diagnosed cancers in women worldwide. Surgical site infection (SSI) is among the most prevalent health-care-associated infections (HAI). They follow between 10 and 35 percent of the gynecologic oncology surgeries performed worldwide. SSIs are defined as infections that happen within 30 days following surgery, according to the CDC and National Health Safety Network. Likewise, the US Centers for Disease Control and Prevention (CDC) have divided surgical site infections (SSIs) into three categories: deep, organ/space and superficial. The National Research Council of the USA developed a system for classifying incisions into clean, clean contaminated, and contaminated categories based on the degree of contamination of the incision. For patients with gynecologic oncology having laparotomy, the Enhanced Recovery after Surgery (ERAS) 2019 recommendations advocated the use of the surgical site infection reduction bundle (SSIRB). The adoption of these coordinated interventions has been strongly linked to SSI reduction. The primary purposes of the surgical site infection reduction bundle are to sustain perioperative normoglycemia, preventing hypothermia, antimicrobial prophylaxis, and skin and bowel preparation.

Aim of the Work

The aim of this study was to identify different patients' risk factors for surgical site infections following surgery for gynecologic cancers at the gynecologic oncology unit in El Shatby maternity university hospital.

Patients and Methods

Patients and Method: This study included 300 women who were managed by conventional laparotomy for gynecologic cancers at El Shatby maternity university hospital and were followed up via regular visits for 4 weeks after approval of ethical committee of Alexandria Faculty of Medicine.

Inclusion Criteria: - Any age

- All resectable gynecologic cancers excluding vulvar & vaginal cancer

- Medically fit for surgery

- Patients who were managed by conventional laparotomy via any type of abdominal incision as midline, Maylard or Cherney incision.

Exclusion Criteria: - Managed by laparoscopic surgery.

- Received neoadjuvant chemotherapy &/ radiotherapy

- Other non-gynecologic cancers - Benign tumors - Concurrent pregnancy

After signing their informed consents, all patients managed by conventional laparotomy for gynecologic cancers were subjected to Preoperative assessment including (Detailed History taking, general examination of the patient, routine laboratory investigations) Intraoperative assessment including (Detailed information regarding surgery, intra-operative blood transfusion and presence of any intra-operative complications) Post-operative assessment (All patients were closely followed up during early post-operative period then patients were followed up via 2 regular visits at 2 and 4 weeks.

Sepsis workup in patients diagnosed with SSI infection including (routine labs, wound swabs, urine analysis &/ urine cultures, blood cultures).

Results

Table 1: Distribution of the study population according to demographic data

Demographic data	Total (n = 300)	SSI		Test of sig.	p
		No (n = 252)	Yes (n = 48)		
Age (years)					
Min. – Max.	5.0 – 80.0	5.0 – 80.0	19.0 – 73.0	U= 3393.0	<0.001
Mean ± SD.	51.51 ± 17.06	49.77 ± 17.14	60.63 ± 13.48		
Median (IQR)	56.0 (43.0 – 64.0)	53.50(41.50 –63.0)	65.0(55.50 –69.50)		
BMI (kg/m²)					
Min. – Max.	18.0 – 50.0	18.0 – 50.0	20.0 – 44.0	t= 3.485*	0.001*
Mean ± SD.	32.88 ± 6.75	32.30 ± 6.72	35.94 ± 6.13		
Median (IQR)	32.0 (28.0 – 37.0)	32.0 (28.0 – 35.0)	36.50(32.50 –40.0)		

Table 2: Distribution of the studied cases according to SSI (n = 300)

	No.	%
Total SSI		
No	252	84.0
Yes	48	16.0
Superficial SSI		
No	258	86.0
Yes	42	14.0
DEEP/organ space SSI		
No	294	98.0
Yes	6	2.0

The overall incidence rate of SSI in the present study was 16% (48/300), about 42(87.5%) had superficial infections while 6(12.5%) had deep/organ space infections. In the initial comparison of risk variables between patient groups with and without SSI previous history of laparotomy (p value 0.5), family history of malignancy (p value 0.8), comorbidities as (CVS, chest disease)(P value ≥0.05), Type of surgical

incision (P value 0.07) showed no statistically significant difference between both groups. Risk factors associated with SSI identified from univariate analysis(higher BMI (mean 35.9) (p=0.001), advanced age (mean 60.6y) (p=<0.001), positive history for DM (p=0.004), ASA class ≥II (p=<0.001), zubrod score ≥2 (p=0.001), post-operative lower HB level (less than 10 gm/dl) (p=0.03), prolonged preoperative hospital stay mean (3.44 ± 1.18) days (p= <0.001), presence of viral hepatitis (p= 0.001), prolonged duration of surgery mean (3.1 ± 0.99 hrs.) (p=<0.001), higher surgical complexity score (p value 0.001), perioperative blood transfusion (p= <0.001), abnormal postoperative vitals (as hyperglycemia or oliguria) (p=<0.001), delayed discharge of the patients (p= <0.001) The independent risk factors identified in multivariate analysis in our study were malignancy of uterine origin (mainly endometrial cancer) (P value 0.001*) OR (95% C.I) (96.400) (7.318 – 1269.915), postoperative hypoalbuminemia (less than 3.5g/dl) (P value <0.001) OR (95% C.I) (397.0) (22.7 – 6948.8), presence of intraoperative complications (P value <0.001)* OR (95%C.I) (459.744) (29.449-7177.42) and perioperative hyperglycemia (P value 0.001), OR (95%C.I) (1.196) (1.088–1.316)

Conclusion

- Incidence of SSI is about 16% following surgery for gynecological cancers as detected in our study.
- Implementation of SSIRB reduced incidence rate of SSI after surgery for gynecological cancers in our unit compared to other local centers.
- Majority of patients developed superficial SSI. Patients who developed deep SSI rapidly progressed into organ/space SSI. Organ/space SSI had a very poor prognosis in cases of gynecologic cancers.
- Uterine cancers mainly Endometrial cancer patients had the highest incidence of SSI among all gynecologic cancers.
- Perioperative hyperglycemia should be considered as a powerful risk factor for SSI even in non-diabetics.
- Perioperative hyperglycemia, hypoalbuminemia, intraoperative complication, and uterine malignancy mainly endometrial cancers were independent risk factors for SSI as detected by multivariate analysis. Many other risk factors were detected by univariate analysis as higher BMI, advanced age, DM, positive history for DM, ASA class ≥II, zubrod score ≥2, post-operative lower HB level (less than 10 gm/dl), prolonged preoperative hospital stay mean (3.44±1.18) days, presence of viral hepatitis, prolonged duration of surgery mean (3.1±0.99 hrs.), higher surgical complexity score , perioperative blood transfusion
- Close follow up of patients after surgery for Gynecologic cancers facilitate early detection of SSI, improving outcome in majority of patients.