

Implementation of a Surgical Site Infection (SSI) Prevention Bundle in Reducing the Incidence of Post-Mastectomy SSI among Breast Cancer Patients in Malaysia

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Introduction

Surgical site infections (SSI) are common healthcare associated infections. The incidence of post-mastectomy SSI varies from 1 to 30%, which is significantly higher compared to the expected incidence of 2% for clean surgeries.

Objective

- To assess the effectiveness of the SSI prevention bundle and estimate the cost implications of the SSI prevention bundle
- To identify the risk factors associated with SSI among breast cancer patients undergoing mastectomy at an academic medical centre

Methodology

- The pre-post cohort study was conducted between July 2015 and September 2018 at the Universiti Malaya Medical Centre (UMMC), a tertiary teaching hospital
- The pre-implementation baseline SSI rates were obtained from July 2015 to June 2016 retrospectively and the post-implementation SSI rates were collected prospectively between July 2017 and September 2018
- The implementation of the SSI prevention bundle was based on the quality implementation framework
- The SSI prevention bundle consists of preoperative, intraoperative, and postoperative evidence-based preventive measures adapted from the Global Guidelines for the Prevention of SSI by the World Health Organisation

Results

- SSI rate dropped by **70%** after implementing the SSI prevention bundle
 - 6.9% (11 out of 159 cases) post versus 23.1% (27 out of 117 cases) pre implementation
- Risk factors for SSI (Multivariate logistic regression analysis):
 - patients undergoing surgery during the pre implementation of the SSI prevention bundle (OR: 5.28, 95% CI: 1.76–15.82, p value = 0.003)
 - obesity (OR: 6.34, 95% CI: 1.44–30.00, p value = 0.02)

Table 1: Cost Analysis of Patients with SSI (n = 38)

Cost results	Patients with SSI			All patients with SSI who received treatment in the study centre (n = 38)
	Patients with SSI treated as outpatient clinic setting (n = 29)	Patients with SSI treated as inpatient admission followed by outpatient clinic setting (n = 7)	Patients with SSI treated as inpatient admission (n = 2)	
Mean cost per patient, RM (\pm SD)	904 \pm 991	13,760 \pm 6,001	10,604 \pm 1,040	3,783 \pm 5,878
Range of cost per patient, RM	296 – 4,828	9,968 – 28,327	9,564 – 11,644	296 – 28,327
Total cost for all patients, RM	26,210	96,32	21,208	143,741

Discussion

- More than half of SSIs are preventable with evidence-based strategies, similar to the findings of other studies¹
- The bundle approach is believed to create awareness about SSI prevention, therefore improving compliance, which further leads to a reduction in SSI rates²
- Obese patients were 6.3 times more at risk of developing SSI post-mastectomy compared to patients with ideal weight
- Patients undergoing surgery without the SSI bundle were at risk of developing SSI postoperatively
- The mean cost per patient treated for SSI ranged from RM904 to RM13,760

Conclusion

The SSI prevention bundle was effective in reducing the incidence of SSI among breast cancer patients undergoing mastectomy. This bundle not only improved patient outcomes but also showed cost-saving benefits. Continuous monitoring within departmental quality key performance indicators and hospital infection control programmes will ensure sustained outcomes in the prevention of SSI.

References

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