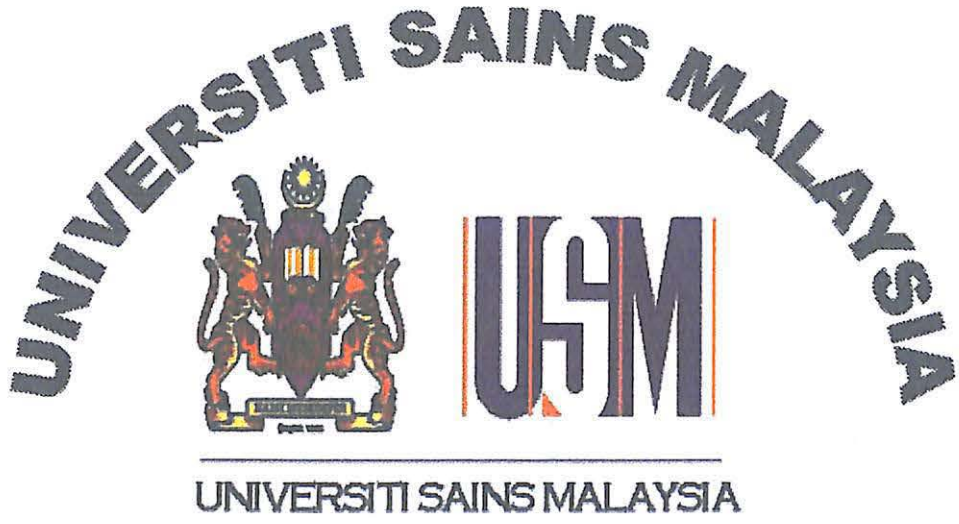

UNIVERSITI SAINS MALAYSIA

The Effectiveness of Surgical Wound Dressing by Nurses for Patients Undergoing Elective Surgery in Hospital Universiti Sains Malaysia Kelantan.

Dissertation submitted in partial fulfillment for the Degree of Bachelor of Science (Health) in Nursing

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CERTIFICATE.

This is to certify that the dissertation entitled 'The Effectiveness of Surgical Wound Dressing by Nurses for Patients Undergoing Elective Surgery Hospital Universiti Sains Kelantan, Malaysia' is the bonafide record of research work done by Ms. Purani A/P Suntarajoo during the period of May 2000 to March 2003 under my supervision.

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ABSTRACT

Introduction: The incidence of surgical site infection is 23.3% in Hospital Universiti Sains Malaysia in the year 2000. The causes of surgical site infections include poor care during preoperative, intraoperative and postoperative period During postoperative period, the surgical wound dressing by nurses play a significant role in the occurrence of surgical site infection.

Objective: To reduce the rate of surgical site infection by identifying the risk factor for surgical site infection and the effectiveness of surgical wound dressing

Methodology: Data collection was done using pro forma through follow up of patients. Data were collected on the 3rd and 7th postoperative day for each sample. The pro forma composed of two section. The first section contains demographic data and another section consist of investigation data. In the investigation section, the data was divided into three categories which were related to the surgery undergone , dressing done by nurses and parameter used to identify surgical wound infection. Wound culture was taken on day 3 and day 7.

Results: Six out of 15 patients underwent elective surgery developed surgical site infection attributable to poor preoperative and intraoperative care. Four out of the 15 patients developed surgical site infection attributable to poor wound dressing.

Conclusion: The risk factors for surgical site infection include, the type of surgery (TAHBSO), the duration of surgery (more then 1 hour) and the dressing by op-site spray. The preoperative prophylaxis and the frequency of dressing did not influence the incidence of surgical site infection. Due to time constraint, only a small number of sample could be included in this study. A study including a large number of sample would be recommended to support the findings of this study.

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CHAPTER 1

INTRODUCTION

The 96 hospitals that participated in the Nosocomial Infections National Surveillance Scheme (NINNS 2000) reported 1212 (4.3%) cases of surgical site infections (SSI) among 28407 patients who underwent twelve categories of clinically similar surgical procedures. On comparing the data between 1997-1999, no major differences were found in the incidence of infections for any of the surgical categories (NINNS 2000). Based on NINNS report, SSI were the most frequently reported nosocomial infection among hospitalized patients (Alisa 1999). Infection of the surgical site was one of the most common hospital acquired infection (HAI) (Auerbach 1999).

In Hospital Universiti Sains Malaysia, for year 2000 there were 758 elective surgery and 448 emergency surgery in the department of orthopedic. Of those , 281 (23.3%) developed SSI.

In 1992 , the Surgical Wound Infection Task Force replaced the term 'surgical wound infection' with 'surgical site infection' to include infections of organs or spaces deep in the skin and soft tissues , such as peritoneum and bone.

There are criteria to define surgical site infection. To define surgical site infection , the infection should occur within 30 days after operation and at least with one of the following features:

a. Purulent discharge from closed surgical incision
b. One or more signs and symptoms of infection- pain, tenderness ,localized swelling ,redness ,heat ,fever
c. Positive bacterial culture

(Singhal *et al.* 2000; NINSS 2000; Nandi 1999)

Surgical site infection is a common postoperative complication and the development of wound infection is an ongoing problem for many patients. Infected wound can cause significant postoperative morbidity and mortality, increased length of hospital stay, delayed wound healing process and increased discomfort and adds between 10% and 29% to hospitals costs. Although the total elimination of wound infection is not possible, a reduction in the infection rate to minimal level could have significant benefits in terms of both patients comfort and medical resources used (Nandi 1999; Kinsley 2001). It has been estimated that each patient with a surgical site infection requires an additional hospital stay of 6.5 days and doubling the hospital cost . This increases the morbidity of the patients and consume substantial additional resources (Auerbach 1999).

There are so many factors that can cause surgical site infection . These include poor care during preoperative, intraoperative or postoperative period (Curron 2001; Blunt 2001).

Earlier studies showed that duration of operation, type of surgery, prophylaxis, dressing method, age and other factors could cause surgical site infection (Biedermann 2002; Kinsley 2001).

The objective of this study is to identify the risk factors for surgical site infection in Hospital Universiti Sains Malaysia and to evaluate the effectiveness of surgical wound dressing by nurses.

Chapter 2

REVIEW OF LITERATURE

During 1986-1996, hospitals conducting SSI surveillance in the NNIS system reported, 15,523 SSI following 593,344 operations. Among surgical patients, SSI were the most common nosocomial infection, accounting for 38% of all nosocomial infections. Of the deaths among surgical patients with SSI, 77% were related to the infection itself. Between 12% and 84% of SSI developed after are patients were discharged from the hospital. Since the length of postoperative hospitalization continued to decrease, many SSI might not be detected for several weeks after discharge and might not readmitted to the operating hospital. (Alisa et al 1999) .

According to the Center for Disease Control, approximately 2.6 % of all surgical patients develop a surgical site infection, although the incidence varies from surgeon to surgeon, facility to facility, procedure to procedure and most importantly, from patient to patient (Alicia 2003) .

There were so many studies conducted to look into the risk factor of surgical site infection. They found that a pre-existing medical illness, prolonged operating time and wound contamination would strongly predispose to wound infection. Other factors such as extremes of age, presence of malignancy, metabolic disease, malnutrition, immunosuppression, smoking habit, patients underwent emergency surgery were more prone to get infections. The use of antibiotic prophylaxis was reported to be most effective to reduce surgical site infection (Nandi et al 1999).

There was considerable evidence linking age with an increased incidence of infection and worse outcomes. It might be attributable to age-dependent alterations in immune function (Raymond et al . 2001)

A study was carried out by RDNS Research Unit on the usage of antiseptics in wound management. The results of this research showed that showering and irrigating with normal saline or tap water was the most commonly accepted methods used to cleanse wound to assist healing. Chlorohexidine was considered to be damaging the wound an in fact impairs wound healing. There was much controversy about povidone iodine usage in wound healing (RDNS Research Unit 2000).

Signs of infection, local swelling, heat, pain, tenderness and redness. In clinical practice , a diagnosis of infection is based on the presence of signs and symptoms. These signs of inflammation become more apparent with the severity of infection. (Kinsley 2001 ; Micheal 2002).

Cutting (1994), suggested that a definite identification would achieved by culturing microorganisms. He also reported that clinical indicators, such as inflammation and discharge, had low predictive value of infection in wounds.

A lack of knowledge about the causative of infection coupled with a delay in initiating first line treatment, leads to poor patients outcome. To improve the patient care with wound infection, nurses need to feel confident in their ability to diagnose and treat infected wounds (Kinsley 2001).

Wound should be cleansed to remove foreign bodies, such as derbis, exudates , necrotic tissue or slough, all of which could become a focus of infection (Blunt 2001).

CHAPTER 3

OBJECTIVE

Purpose of the study

To reduce the rate of surgical site infection.

Objective of the study

1. To identify the risk factor for surgical site infection
2. To identify the effectiveness of surgical wound dressing

Hypothesis

H_0 = Surgical site infection is not influenced by wound dressing

H_A = Surgical site infection is influenced by wound dressing

CHAPTER 4

MATERIALS AND METHODS

1. Location of the study

The location of this study was in Hospital Universiti Sains Malaysia (HUSM) Kelantan. The 1U ward, a gynegology ward was chosen because most of the patients would stay at least 7 days after operation.

2. Study design

15 patients were chosen by cluster sampling for this study. Study designed as a follow up study and analytical study. The patients chosen were examined from the 3rd postoperative day until the day 7 to find the occurrence of surgical site infection and the effectiveness of surgical wound dressing.

3. Sample inclusion criteria :

Patients aged 15 years or more, underwent elective surgery and those with clean wound were included in this study.

4. Sample exclusion criteria

Patients with immunosuppresive disorder, diabetes mellitus, underwent emergency surgery, skin disease particularly infections. All the patients with this criteria were excluded because these patients would be more prone to get infection.

5. Methodology

Data collection was done by using pro forma (see Appendix) through follow up of patients. Data is collected on 3rd postoperative day and 7th postoperative day for each sample. The pro forma composed of two sections. The first section contains demographic data and another section consists of investigation data. In the investigation section, the data was divided into three categories which was related to surgery undergone, dressing done by nurses and the other was the parameter used to identify surgical wound infection. Wound culture was taken on day 3 and day 7. The wound was also examined for the evidence of infection.

The following criterias were applied to define surgical site infection :-

a. Purulent discharge from closed surgical incision
b. One or more signs and symptoms of infection which is pain, tenderness , localized swelling ,redness and heat
c. Positive bacterial culture

If any of these criterias occur, it will be considered as surgical site infection.

Limitations

(i) Patients might get infection after 7 days of follow up.

(ii) Small sample size

Ethics

Explanation was given and consent was taken from the patients. All the details taken from the patients were kept confidential.

Statistical analysis

The data were analyzed by Chi Square statistical test using Statistical Package of Social Sciences (SPSS) software.

CHAPTER 5

RESULTS

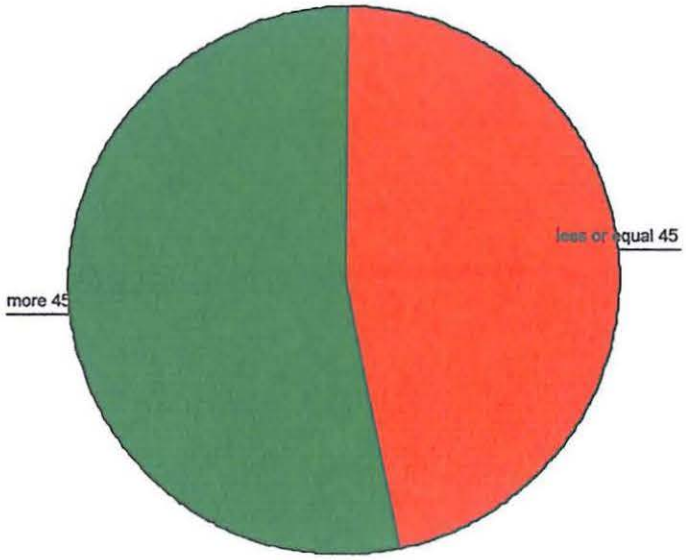
5.1. General demographic characteristic of the samples

The swabs for bacterial culture were taken from fifteen consecutive patients who underwent elective surgery between 16th October 2002 and 15th December 2002 . Postoperatively all the patients were managed in ward 1U. Most of the patients (53.3%) were more then 45 years old. (Table 5.1 and Figure 5.1).

Table 5.1 : Age of the samples

Age	No. of patients	Percent %
Less then or equal to 45 years	7	46.7%
More then 45	8	53.3%

Figure 5.1 : Age according to class



5.2. Types of elective surgery

53.3 % of patients underwent total abdominal hysterectomy with salpingoophherectomy (TABSHO) while the remaining patients underwent 46.7% underwent laparotomy (Table 5.2)

Table 5.2 : Type of operation underwent

Operation underwent	No. of patients	Percent %
TAHBSO	8	53.3
Laparotomy	7	46.7

Among the fifteen patients, the surgery took more then one hour in 13 cases (86.7%) and less one hour for only 2 cases (13.3%) (Table 5.3).

Table 5.3 : Duration of the operation

Duration of operation	No. of patients	Percent %
< I hour	2	13.3
> 1 hour	13	86.7

About all the patients (93.3 %) were given prophylactic antibiotic while only one patient not receive it (Table 5.4).

Table 5.4 : Sample with Prophylaxis

Prophylaxis	No. of patients	Percent %
Given	14	93.3
Not Given	1	6.7

5.3. Surgical Dressing

All the surgical dressing were done by nurses. Two methods of dressing were perfomed for the surgical wound of the patients. In the method, opsite was used in the spray form. In the other method, normal saline was used .

For twelve patients (80%) op-site was used, while for the remaining three patient (20%) normal saline was used (Table 5.5).

Table 5.5 : Type of dressing

Type	No. of patients	Percent %
Op-site (Spray)	12	80
Solution (Normal Saline)	3	20

Nurses performed dressing at surgical site for only 1 time in 7 days for 53.3% of samples and 46.7% received dressing for more than I time (Table 5.6).

Table 5.6 : Frequency of dressing done in 7 day

Frequency of dressing	No. of patients	Percent %
1 times	8	53.3
> 1 time	7	46.7

Surgical site infection by 3rd postoperative day

The surgical wound were examined on 3rd postoperative day for the evidence of surgical site infection. The infection was present in 6 patients (40%). (Table 5.7)

Table 5.7 : Surgical Site Infection (SSI) by 3rd postoperative day

SSI	No. of patients	Percent %
Yes	6	40
No	9	60

The signs of infection, swelling (Table 5.8), redness (Table 5.9), heat (Table 5.10), pain (Table 5.11) and tenderness (Table 5.12) at the surgical site were present in 50%, 83.3%, 83.3%, 66.7% and 66.7% of cases respectively.

Table 5.8 : Localized swelling at the surgical site by 3rd postoperative day

Localized swelling	No. of patients	Percent %
Yes	3	50
No	3	50

Table 5.9 : Redness at the surgical site by 3rd postoperative day

Redness	No. of patients	Percent %
Yes	5	83.3
No	1	16.7

Table 5.10 : Heat at surgical site by 3rd postoperative day

Heat	No. of patients	Percent %
Yes	5	83.3
No	1	16.7

Table 5.11 : Pain at the surgical site by 3rd postoperative day

Pain	No. of patients	Percent %
Yes	4	66.7
No	2	33.3

Table 5.12 Tenderness at the surgical site by 3rd postoperative day

Tenderness day 3	No. of patients	Percent %
Yes	4	66.7
No	2	33.3

Among the patients got infected by 3rd postoperative day majority (66.75%) had undergone TABSHO. The remaining (33.3%) had undergone laparotomy (Table 5.13).

Table 5.13: Type of operation and occurrence of the infection by 3rd postoperative day

Type of operation	Infection		Total patients No.(%)
	Yes (%)	No (%)	
TAHBSO	4 (66.7)	4 (44.4)	8 (53.3)
Laporatomy	2 (33.3)	5(55.6)	7(46.7)
Total	6 (40)	9 (60)	15(100)

On comparing the duration of surgery, 83.3% of surgical site infection developed in patients whose surgery last more than one hour. Only 16.7% of the patients whose surgery last for less then one hour developed surgical site infection (Table 5.14).

Table 5.14: Duration of surgery and occurrence of the infection on by 3rd postoperative day

Duration of operation	**Infection**		**Total patients No.(%)**
	Yes (%)	**No (%)**	
< I hour	1(16.7)	1(11.1)	2 (13.3)
> I hour	5 (83.3)	8(88.9)	13 (86.7)
Total	6 (40)	9 (60)	15 (100)

Surgical site infection after 7th postoperative day.

The surgical wound were examined on 7th postoperative day for the evidence of surgical site infection. The infection was present in 4 patients (26.7%). (Table 5.15)

Table 5.15 : Surgical Site Infection (SSI) by 7th postoperative day

SSI	No. of patients	Percent %
Yes	4	26.7
No	11	73.3

The sign of infection, swelling (Table 5.16), redness (Table 5.17), heat (Table 5.18), pain (Table 5.19) and tenderness (Table 5.20) at the surgical site were present in 100%, 75%, 50%, 75% and 50% of cases respectively.

Table 5.16 : Localized swelling at the surgical site by 7th postoperative day

Localized swelling day 7	No. of patients	Percent %
Yes	4	100
No	0	0

Table 5.17 : Redness at the surgical site by 7th postoperative day

Redness day 7	No. of patients	Percent %
Yes	3	75
No	1	25