

Original Research Paper

Clinical Parameters in Relation to Surgical Site Infection in Patients Attending a Tertiary Care Hospital

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ABSTRACT:

Surgical Site Infections forms an integral part of the surgical care that is provided to the patient. The better the surgical care provided minimal are the chances of having a surgical site infection, but the outcome depends not only on the surgical method and care applied but also on other intrinsic factors as well. In our study aimed at finding the correlation with those clinical parameters. The study was carried between January 2021 to January 2022 in the Post-Graduate Department of Surgery, Acharya Shri Chander College of Medical Sciences (ASCOMS), Jammu. Data was collected of 100 surgeries where there was development of surgical site infections. The relevant history and investigation were performed after taking informed consent from the patient. Most the patient who developed SSI had a Hb between 9-12gm% with moderately raised WBC count in 72% of the individuals. Urine analysis of the patients was mostly normal and fasting blood sugar levels in most were reported as normal. In our study we found that SSI have an inverse relation with the hemoglobin levels of and individual while it has a direct relationship with the WBC count, blood urea levels. While the result on the fasting blood sugar levels, urine analysis and ESR were found insignificant.

Keywords: Infection, SSI's, Surgery.

INTRODUCTION:

Any infection that originates at the site of surgery or after the surgery can be classified as a surgical site infection depending on the part involved or the level in respect to the body involved can be divided into superficial, deep, organ space etc. With the advent of minimal invasive surgeries and sterile methods of operative care the chances are minimized as compared to the old times but still it remains a key area of interest for the surgeons especially due to the antibiotic resistance that is becoming a grave problem both for the doctors as well as the patients requiring care. The intrinsic factors and circumstances under which the surgeries are performed vary with each patient and hence the outcomes of the surgery also vary in the individuals. Various studies demonstrate a prevalence of 5-21% nosocomial infections with wound infections comprising about 1/4th the share of these infections. [1-4] Different precautions can be taken to minimize the incidence of these infections like good surgery technique supplemented with good peri-operative care and decreased hospital stay all these will lead to a decrease in the incidence and has a better outcome on

the health of the patient as well as minimize the expenditure on the health.

MATERIAL AND METHOD :

The study was carried between January 2021 to January 2022 in the Post-Graduate Department of Surgery, Acharya Shri Chander College of Medical Sciences (ASCOMS), Jammu. Data was collected of 100 surgeries where there was development of surgical site infections was reported. The relevant history and investigation were performed after taking informed consent from the patient. The data regarding the site, length, type of incision along with the duration of that operation was collected. The wounds were serially examined and after diagnosing the infection clinically the swabs for confirmation were also collected. The data was collected and compiled using the Microsoft Excel.

RESULTS:

Among the various blood tests performed sample was sent for measuring the hemogram of the patients among the 100 patients which were having SSI's most of them i.e. 63% had a Hb level between the range of

9-12 gm% , followed by 12-15 gm% in 34% and only 3% having Hb between 6-9 gm%. The detailed data is given in table 1.

Table 1. Relation of hemoglobin levels with SSI's.

Hemoglobin (gm%)	No. of patients with SSI
6-9	3
9-12	63
12-15	34

In these patient most of them had a raised WBC count with only 9% having a very increase in the count above the level of 12000.The complete data is provided in the table 2.

Table 2. Leukocyte count in the patient with SSI's.

Total Leukocyte Count	No. of patients with SSI
4000-8000	19
8000-12000	72
>12000	9

77% patients had a normal ESR levels while only 23% had a raised ESR levels. The urine analysis was also performed on these patients to look for the urinary tract infections as a cause for the SSI's. The complete detailed data in presented in the table 3.

Table 3. Urine analysis of the patients having SSI's.

No. of Pus cells/HPF	No. of patients with SSI
0-4	89
5-9	6
10-14	3
>15	2

The fasting blood sugar levels were estimated in these patients and most of them reported a normal blood sugar level between the <90 mg/dl while only 3 had a blood sugar level above 120. The data is given in table 4.

Table 4 Relation of fasting blood sugar levels and SSI's.

Blood Sugar Level (mg/dl)	No. of patients with SSI
<90	83
90-100	5
100-110	7
110-120	2
>120	3

In 56% individuals with SSI's the blood urea levels was between the 10-25mg/dl while 42% had a urea level between 25-40 mg/dl. The data is provided in table 5.

Table 5. Relation between blood urea levels and SSI.

Blood Urea Level (mg/dl)	No. of patients with SSI
10-25	56
25-40	42
>40	2

DISCUSSION:

Surgical site infection incidence various from place to place and depends on the various factors including patient condition and surgical technique used. Hence generalization is difficult to be achieved and the outcomes are individualized. In our study the number of patients developing SSI were having mild anemia with Hb levels falling between 9-12 gm%. Hence, we can confer that the hemoglobin levels have an inverse relationship with the development of SSI. The reason few people had a Hb less than 9% is that before undertaking a surgery the Hb levels were corrected to optimize the patient for the surgery and very few emergency surgeries were performed during the study period. The relationship of hemoglobin with the development of surgical site infection has long been studied and severe anemia has been identified as a significant risk factor for the development of these infections. [5-7] Infections are known to cause an increase in the levels of the WBC's the main cell lineage which helps fight against the various infections and in our study, we found that there is a moderate increase in the levels of leukocytes in such cases and only a few of them have a marked increase mainly due to the fact that all of them were already on post operative antibiotics as decided by their treating surgeon. This same correlation of the levels of WBC's and infection is demonstrated in many studies. [8] Most of these individuals were found to have a normal urine analysis and this proves that local causes are more important as a cause of these infections than the distant foci of infections but catheterization of the patients after operation is a common cause for the patient to develop UTI. [9] The erythrocyte sedimentation ratio is a nonspecific test which can be raised in a variety of condition but was found normal in most of our patients. Blood sugar levels is an established factor which leads to the development of infections but most of our study group reportedly had a normal blood sugar levels because peri-operatively the patients were given insulin and strict monitoring of the dosage was being done, a better way would have been

to measure the HbA_{1c} levels of the patients, but that would have significantly increased the cost of the study and hence was avoided as this fact is already well established. [10-12] Post operative state is a catabolic state which leads to the increased excretion of the nitrogen and hence increase in the blood nitrogen levels in our study we also saw a moderate increase in the levels of the urea in our patients. Although the study was able to identify and correlate the commonly used parameters with the occurrence of SSI still the data can't be extrapolated to a large population because of the fact the variable like ethnicity and cultural background was not considered and the size of the population under study was very less.

CONCLUSION: In our study we found that SSI have an inverse relation with the hemoglobin levels of and individual while it has a direct relationship with the WBC count, blood urea levels. While the result on the fasting blood sugar levels, urine analysis and ESR were found insignificant.

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