DISCUSSION
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Post-operative wound infection is designated to one of the three categories.

1. Inapparent (infection present without disease).

2. On admission (infection present on admission).

3. Hospital acquired (nosocomial) - one that develops within the hospital or is produced by micro-organisms acquired during hospitalization (8).

Organisms that cause nosocomial infection come from either endogenous or exogenous sources. Endogenous infections are caused by patient's own flora whereas the exogenous infections result from transmission of organisms from a source other than the patient.

The post-operative wound infection rate as reported by various workers in the literature varies from 1.8% to as high as 55.6% (2, 5, 25, 53). Public Health Laboratories service (37) reported sepsis rate in different hospitals of England & Wales undertaking general surgery 4.7 to 22.6%. Lawrence S. Cohen (13) reported 16% post-operative infection rate in his study while John S.S. Stewart (46) reported 1.8% post-operative wound sepsis rate. In 1964, Committee
on trauma (14) published a report on post-operative wound infection and it varied from 3 - 11% in different hospitals. S.B. Kowli et al. (30) reported 42% post-operative infection rate, while M.A. Khan reported it 20.2%.

In present study the overall incidence of post-operative wound infection was 9.6%, which is fairly compatible with previous studies.

The post-operative wound infection rate depends upon large number of factors like longer the pre-operative stay greater was the incidence of post-operative wound infection shown by many authors (30, 37, 40, 57). Longer the duration of operation, greater the incidence of post-operative wound infection shown by Hasek, Venkataraman & Public Health Laboratories report (37, 54, 55). In contrast to these, Shaw et al. (43) reported that post-operative wound sepsis is not dependent on the duration of operation and stated that different operations had their own infection rates decided mainly by the endogenous factors. How (24) suggested that any breach of asepsis in the operation theatre is responsible for high infection rate.

Rao, Naraha, Stewart & Douglas (40, 46) observed lowest infection rate in cases kept first in the operation list. Endogenous micro-organisms were suggested by
Kimmelmann et al (20) and Story (52) as a cause of post-operative wound infection. However, our study was not aimed to see the effects of all above factors, hence they have not been worked out.

In our study post-operative wound infection rate was slightly higher in males as compared with females. Out of 573 males, 56 (9.77%) developed post-operative wound infection and 60 females out of 427 (9.36%) developed infection. However, this difference was found to be statistically insignificant ($p \geq 0.05$). Cohen et al (13) reported the same findings while others have reported higher infection rate in females in their studies (9, 14, 33, 37).

The post-operative infection rate was apparently higher (21.4%) in older age group ($\geq 80$ year) in our study. However, this was again found to be statistically insignificant ($p \geq 0.70$). So in our study, age of the patient had no bearing on the post-operative wound infection. Brune (9) and Lidwell (33) have also considered age as an independent factor. While some worker (14, 37) have reported higher infection rate in older age group.

Infection rate was highest in infective group (22%) and lowest in clean group (9.78%). High infection rate in infective group was found to be statistically significant ($p \leq 0.001$). Similar findings have been reported by other workers also (39, 12, 36).
The post-operative wound infection was highest in simple mastectomies and lumbar sympathectomies and lowest in herniorrhaphies. Increased rate of infection in mastectomies and lumbar sympathectomies apart from other reasons could be due to use of drains in these operations. Drainage provides an outlet for collected serum and blood and prevents haematoma formation and thus it may diminish the risk of wound infection, but it is also true that drainage communicates the tissues with the exterior for a longer period and may act as a pathway for pathogenic bacteria thereby increasing the risk of infection.

Lidwell (33) and Cohen (13) et al have reported a higher incidence of post-operative sepsis in drained wounds.

In our study staphylococci (41.67%) were mainly responsible for post-operative wound sepsis. Agrawal (2), Kumar (39) and others (12, 13, 23, 40, 44, 54, 55) have quoted a high staphylococcal wound infection (49.3 to 62%). Subramanian et al (53) however reported 70% gram negative bacilli and 30% gram positive cocci from wound infection. Shaw et al (43) reported that 72.3% post-operative wound infections were due to staph. aureus. Bensley et al (6) have reported 83% mixed infection while Stem et al (40) have reported two thirds of intraoperative infections to be due to mixed aerobes and anaerobes. Mehta et al (35) have reported Klebsiella as predominant aerobe in perforative peritonitis. There are a number of reports
saying that in recent years, gram negative bacteria have supplanted gram positive cocci as a cause of the majority of local wound infection (4, 10, 20, 57). However, in our study gram negative bacteria were found in 52% cases.

For scoring of post-operative wound sepsis, grading system of F.A. Flebute et al (17) was applied to 96 cases. Highest sepsis score in our study was 16, while Flebute et al (17) had reported it 20 in their study. Lawrence F. Stevens (47) developed a method for scoring the severity of a septic process based on deteriorated functions in seven key organ systems of the body and the mean sepsis severity score in his study was 29 in survivors and 49 who died. Bohman et al (7) applied APACHE II (37) scoring system in cases of abdominal sepsis. The mean APACHE II score in patients who died was 18.9 compared with 11.4 in survivors.

In all infected cases when analysis of highest sepsis score during hospital stay and type of surgery was done it was found that highest sepsis score was significantly higher in infective group of surgery ($p \leq 0.05$). However, duration of post-operative stay was insignificant ($p \geq 0.20$) in relation to highest sepsis score. So post-operative hospital stay may be increased or decreased, depending upon other factors.
As far as mortality was concerned, 6 patients
died in our study. Out of 6, one patient was from clean
group, a case of cholecystectomy died on second post-
operative day, cause of death was more likely myocardial
ischaemia, but death was not due to sepsis. Rest 5 patients
were from infective group. Highest sepsis score was 16 in
two patients, out of five who died and in rest of three,
it was ranging from 5 to 8. High mortality in infective
group was found to be statistically significant (P < 0.001).
While overall mortality by sepsis score was insignificant
(P > 0.80). In the study of E.A. Helbute (17), five
patients died out of 15 and in 4 of them, the highest
sepsis score exceeded 20, whereas in the patients who
survived the score only rose above 20 in one.

This system of grading of sepsis differs from
injury severity score in that it tells the severity of
sepsis at a particular time whereas a patient's injury
severity score remains the same throughout his course.
The sepsis score can thus be used to follow the progress
of a patient. This method shows a possible, simple way
of grading a patient's sepsis and it has been also found
very useful in the work on the metabolic aspects of
sepsis (50).

At this stage, the scores allotted to various
features of sepsis are largely arbitrary although their
order for a particular attribute, is probably correct.
Several comments can be made on the individual gradings. The range of temperature scored above 0 is outside the normal range of $36.9 \pm 0.47^\circ C$ (16) and the grading of the changes in temperature has been influenced by findings of Altmeier et al (1). The inclusion and rating of metabolic acidosis reflects the work of Mac Leod et al (34). Renal failure, mental disturbance and bleeding diathesis have been given a maximum score of 3, but with more experience, it may be necessary to increase it. The rating of thrombocytopaenia is supported by data of Kregor et al (31). The range of the laboratory tests used has been deliberately kept to a minimum of those readily available. No attempt has been made to score 'septic shock' directly because of the difficulty of getting a precise definition that would be universally accepted.

If the method is to come into general use large bodies of data should now be build up not only for thoraco-abdominal sepsis but also for sepsis in other situations such as multiple trauma and burns. This would test the general validity of the system and allow more sophisticated methods (51) to be used to determine the best values for the scores. It would also enable one to see if it was necessary to score all the attributes listed above to get a meaningful score and whether the same system was equally useful for all purposes e.g. studying the effect of age on the responses to sepsis.