

An observational study on the newer changes in the protocol of surgical care in COVID times at a tertiary centre

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Abstract:

Since the COVID pandemic surgical safety protocols in all aspects of pre, intra and post operative phase . Hence an observational study to process the new norm of surgical protocols in the COVID times at a tertiary center is the need of time, so as to understand, refine and redefine the pathways of approach to surgical patients in this situation. Hence such a study was done in Bowring and Lady Curzon Hospital to understand, refine and redefine SOP (standard operating procedure). The objective of the study was to observe the Precautionary measures taken by the surgical department since the COVID pandemic and the extent to which it was followed.

The COVID staff was monitored for 20 surgical cases. It was observed that in 19 out of 20 cases the SOP issued by the administration was followed. The Surgeons had 100% compliance with the SOP right from the OPD till the Post op care and had a lesser infection rate. Wearing PPE kit, hand hygiene, social distancing was done by staffs of all levels. The use of face shields was about 50% among the Group D staff, which had a higher rate of infection.

Keywords: COVID infection, Standard operating procedure

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I. Introduction:

The Corona virus disease originated in the Wuhan city, China in December 2019. In a short span of time of about 3 months (March 11 2020), the outbreak was declared as a pandemic by the WHO. For the effective management of the disease, a drastic measure of concentrating resources including manpower to manage the pandemic was taken by the health care system. Many departments were affected by these changes. The surgical department especially had detrimental effects such as a decreased number of cases, decreased man power, increased risk of contracting COVID etc. In the current COVID crisis, surgical departments in many institutions had to make several modifications as well as take some extra precautions while practicing so as to prevent infection among staff and consequent loss of manpower. As times are changing, so are the surgical protocols in all aspects of pre, intra and post operative phase. Hence, different tertiary care centres developed their own **Standard Operative Procedure(SOP)** to curb the incidence of COVID infections among the Health Care Workers.

II. Aims and objective:

Despite formulating SOPs, there has been a high incidence of COVID infection and death amongst health care workers indicating that there are certain lacunae either in the SOP itself or in the degree to which it being followed. Hence an observational study to process the new norm of surgical protocols in COVID times at a tertiary center is the need of time, so as to understand, refine and redefine the pathways of approach to surgical patients in this situation.

The following are the objectives of the study:

1. To observe the changes that have been brought into the surgical practice since the COVID pandemic in different phases of surgical practice i.e.

- Pre operative
- Intra operative
- Post operative

2. To study the extent to which it was followed by each member (from the operating surgeon upto the group D staff) involved in the team managing the patient planned for surgery.

III. Methodology:

- **Study design:** Observational single group study
 - **Study period:** May 2020 to August 2020
 - **Place of study:** The study was conducted in the Bowring and Lady Curzon Hospital, Bangalore.
 - The management team was monitored for 20 surgical cases.
 - The managing team included
 1. Surgical team : 5 consultant, 10 post graduate resident, 10 interns
 2. Nursing staff: 5 nurses
 3. OT assisting team: 5 members
 4. Group D workers: 6 members
- After obtaining ethical clearance and consent, the observational study on precautions taken by each member of the surgical team and by the administration to safeguard the staff from COVID -19 infection was monitored. The members were observed for their adherence to the given protocols in every step of management i.e. Pre-operative, Operative and Post Operative phase.

IV. Results:

The following are the surgical precautions taken in different phases of patient management:

PRE OP:

Precautions in OPD

Since the surge of the COVID pandemic the patients arriving at the surgical outpatient department(OPD) have been dealt with following precautions:

1. All the staff including the doctors, nurses and group D workers were to wear the standard personal protective equipment (PPE) including gloves, gowns, shoe covers, head covers, masks, respirators, face shields and goggles.
2. Patients were not allowed to enter the OPD without mask and were also told to wear it properly since most of them were uneducated and usually did not cover the nose completely.
3. Not more than one attender per patient was allowed inside the OPD as well as the casualty.
4. A minimum distance of 6 feet was maintained while taking the history from patients and patients were always specifically asked about COVID symptoms such as fever, breathlessness, sore throat, myalgia etc. irrespective of whether they complained of them or not.
5. Clinical examination was kept brief as far as possible to limit the contact period, examinations requiring the patients to cough, such as testing for cough impulse in cases of inguinal swelling was avoided as far as possible.
6. The OPD and casualty was sprayed with 2% hypochlorite solution, especially over the surfaces of the tables, chairs, examination beds etc.
7. For examination of patients, an additional pair of gloves were worn by the examiners over a first pair of gloves, and the extra pair discarded after examining each patient.
8. Surgical patients showing signs of COVID infection along with their surgical problems were shifted to the COVID section of the hospital after stabilization.
9. The staff were not allowed to carry any personal articles such as phones, wallets, pens, keys etc. inside the OPD.
10. Separate mobile phones with access to all the sections of the hospital were given to OPD as well as casualty.
11. Patients planned for admissions were tested initially by Rapid Antigen Test (RAT) and afterwards with RT-PCR.
12. Patients who had respiratory symptoms were tested for inflammatory markers such as LDH, Procalcitonin, D-dimer, hs-CRP, Ferritin, ESR, Interleukin- 6.



FIGURE 1: PPE KIT



FIGURE 2: OPD MANAGEMENT



FIGURE 3: SPRAYING HYPOCHLORITE SOLUTION



FIGURE 4: DOFFING AND DISPOSING USED PPE KITS

PROMOTING OPD TREATMENT:

Maximum efforts were put to treat patients on an OPD basis, so as to decrease the Non-COVID case load and resources could be concentrated over the COVID side.

For example, patients with diabetic foot, abscesses, necrotizing fasciitis were called for debridement and dressing to the minor OT on fixed days instead of inpatient monitoring.

Elective Cases:

Hernia: Patients with uncomplicated hernia were deferred surgery and were asked to take precautions such as avoiding lifting weights or straining while passing stools and were educated about warning signs such as pain in abdomen, inability to pass stools and bleed per rectum, in cases of which they were asked to seek immediate surgical opinion.

Varicose veins : Patients were recommended compressive stockings and were asked to avoid long periods of standing.

Malignancy: Cases of malignancy such as of breast and thyroid were usually referred to other cancer centers.

Similar Conservative methods were followed wherever possible.

DECISION TO OPERATE:

1. Even after admission, conservative management was tried for most cases, especially if the patient had comorbidities and was >60 yrs of age. The decision to operate was taken only in those patients whose condition was beyond conservative treatment and only after discussing the risks and benefits of the surgery with the concerned staff. Some of the OT cases operated in our centre to name a few were:

- Exploratory laparotomy for Hollow viscus perforation with peritonitis
- Above elbow amputation for Acute limb ischemia of the left upper limb
- Hernioplasty for obstructed umbilical hernia

2. Patient is then worked up for surgery as per routine and if the patient's COVID RT-PCR is >48 hours old, it is repeated.

3. A separate OT was established in our centre to operate on positive patients located at a distance from the general OT. The nursing staff were informed to prepare the OT involving the fumigation of OT and arranging the PPE kits.

TRANSFER OF PATIENT TO OT:

1. The Group D staff for shifting were equipped with complete PPE kits and used a separate stretcher to transport COVID positive patients.

2. In case of patients requiring oxygen, a separate oxygen cylinder and mask was used.

3. The staff were sprayed with hypochlorite solution once they transferred the patient to OT, before doffing their PPE.

INTRAOP PRECAUTIONS:

1. The surgeon was required to wear the PPE before entering the OT and wear a disposable OT gown over it after entering the OT.

2. Minimal staff was allowed inside the OT including the surgeon, first assistant, second assistant(only if needed), staff nurse and anaesthetist.

3. One Group D staff was present outside the OT room (wearing PPE) in case of any intra-operative needs.

4. Anaesthetist tried to avoid General Anaesthesia as far as possible, so as to avoid intubation which generates high amount of aerosol putting all personnel at risk of contracting the infection.
5. Electrocautery was avoided as far as possible, as there is no sufficient evidence to rule out the spread of COVID virus by the gas generated by cautery. It was used as sparingly as possible to avoid fumes, and any fumes were suctioned by the assistant and continuous use of cautery at a single point was avoided.
6. Laparoscopic surgery was avoided altogether because of the requirement of a large volume of gas, and the risk of leak of CO₂ from the port site.
7. Most of the surgeries were done by the senior staff and senior residents so as to minimize the operative time, complications and hence also minimize the time of exposure.
8. Post surgery after removing the surgical gown, all staff were sprayed with hypochlorite solution.
9. Post operatively, patient was shifted to the post operative ward designated for COVID patients.

POST OP CARE:

1. Patients were monitored inpatient for as less number of days as possible, until they were stable enough to be followed up on outpatient basis.
2. Stable patients with drains were discharged with the drain in situ and were taught proper care of drain at home and advised the regular follow up.
3. Patient beds were placed at distance of 6 feet from each other.
4. In case of patients developing symptoms of COVID, they are tested again by RT-PCR.
5. Staff involved in the surgery were advised to watch for symptoms of COVID for atleast 5 days post surgery and to get themselves tested if they developed symptoms..
6. Low molecular weight Heparin was resumed after 8hrs of surgery for patients who were given the drug pre-operatively for COVID infection.

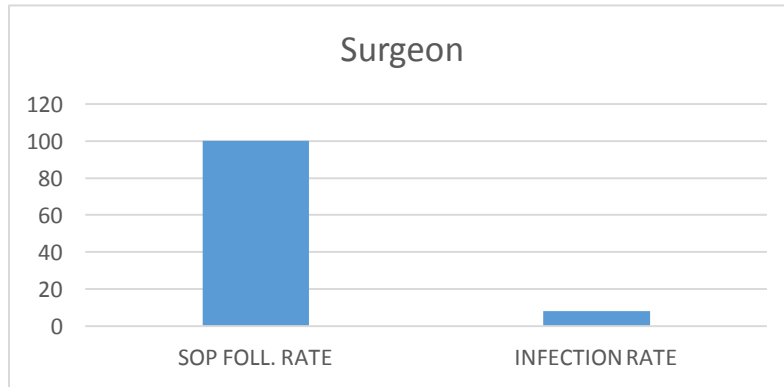


FIGURE 3: POST OP MANAGEMENT

The following are the degrees to which each group of members were adherent to the Safety protocols, and the infection rate among them during the period of study.

Surgeons :

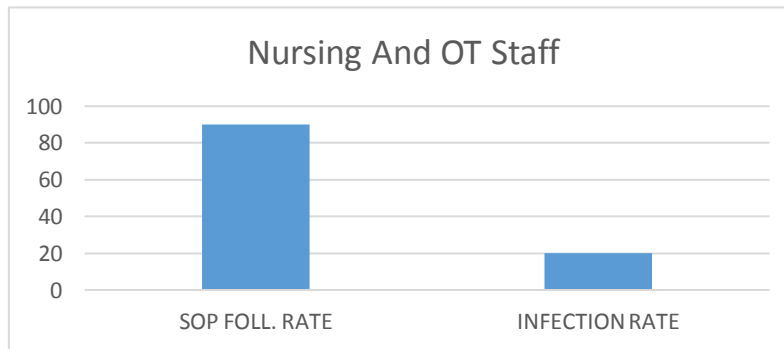
- Among surgery staff there was a 100% adherence to the SOP
- In the team of 25 only 2 members contracted COVID, giving an infection rate of 8%.
- The infected surgeons had mild infection and were quarantined for 14 days and recovered in a span of 1 month.



Graph 1: SOP following rate VS. Infection Rate among Surgeons

Nursing and OT staff :

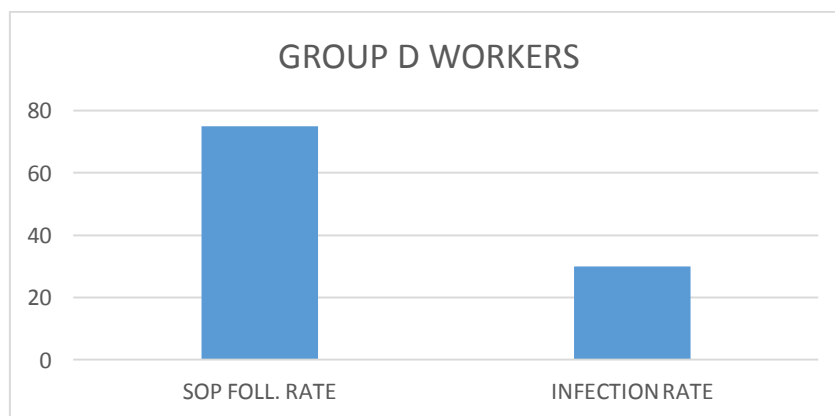
- Among the Nursing and OT staff, 90% followed the SOPs with only 10% defaulting.
- Infection rate among them was seen to be around 20%.



Graph 2: SOP following rate VS. Infection Rate among Nursing and OT staff

Group D Workers:

- This group saw the least number of members following the protocols I.e. only upto 70%
- The infection rate among this group was around 30%.
- It was seen in most of the cases that the workers didn't wear the mask properly and were not using Face shields.



Graph 3: SOP following rate VS. Infection Rate among Group D workers

V. Conclusion:

- It is observed that a higher degree of adherence results in a decrease in the infection rate among the medical staff.
- Incidence of COVID infection even in those who followed protocol reflects the need for better adherence to SOP and/or need for revising the existing protocol.

- There is inadequate training of the Group D workers, due to which there is lesser adherence to SOP and a consequent increase in infection rate among them.
- Despite having a small sample size, this study provides insight into the lacunae in the SOPs and the need for its refinement and better implementation.
- This study also reflects the need for a multicentric study, to compare SOPs and their efficacy, and use the knowledge gained to standardize protocol so as to minimize the risk of contracting COVID infection in health care workers in the surgical department.

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