Outcomes of Standard Operating Procedures Instituted for Non-COVID Outpatient Department During COVID-19 Pandemic in Rural India

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Abstract

Introduction: COVID-19 has emerged as a major health care problem during 2020. The risk of infection and transmission led to imposition of a severe lockdown by the government. The diversion of health care machinery towards the control of transmission, treatment of the infected individuals led to a compromise in delivery of care towards non-COVID ailments. This is truer in rural and unapproachable areas where the health facilities were already in jeopardy. Study Design: A prospective observational study was conducted from May 2020 to November 2020 at PGIMER satellite center, Sangrur. Methods: Standard operating procedures (SOP) were instituted for physical consultation during the COVID-19 pandemic at PGIMER satellite center, Sangrur, a branch of PGIMER, Chandigarh. These were approved by the committee constituted for this purpose. The effectiveness of these SOPs was reported as percentage of healthcare workers who contracted infection for non-COVID OPD. Results: A total of 9963 patients attended the Out Patient Department (OPD). Male to female ratio of the patients was 1.2:1. Maximum (6141) consultations were sought for general physician followed by ophthalmologist (1464). Majority of the consultation were for benign non-communicable disorders. Seventy patients who visited the OPD were referred for COVID-19 testing as they had symptoms of infection. A total of 5 (3.8%) incidents of COVID-19 infection were reported among the healthcare workers at the center. Conclusions: The SOPs proved effective in the delivery of physical care with low occupational hazard to the healthcare workers (HCW).

Keywords: COVID-19, non-COVID OPD, standard operating procedures

Introduction

SARS-COV 2 or corona virus disease (COVID-19) related respiratory illness has emerged as a major health problem since December 2019. It is a zoonotic disease without any specified treatment so far.⁵ Ever since its outbreak from Wuhan in China,⁶ increasing number of cases are being detected from different parts of the globe.

The transmission rate of the virus (R0) varies between 2-3%. These patients suffer from cough, generalized malaise, fever and myalgia. Acute respiratory illness leading to end organ failure is major cause of mortality among these patients. Mechanical ventilation along with certain antiviral agents has been successfully tried in many patients.⁷ Social distancing, repeated hand washing, use of alcohol-based hand sanitizers and face masks have emerged as useful measures to control the transmission of this infection.⁸

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Since the declaration of the pandemic by World Health Organization (WHO) on 11 March 2020 various control measures have been instituted by different countries. India, second most populous country resorted to complete lockdown on 24 March 2020. The health facilities in the country were geared up for increased detection, isolation and treatment of the cases. Our hospital, a proposed tertiary care center in north India offers only outpatient services as the indoor hospital is in the developing phase. These were also shut due to the lack of transport facilities for the routine outpatient care and many resources of the health care system were shunted for COVID-19 care. India observed complete lockdown till 18 May 2020. Till then the number of infected cases was ever increasing from 1403 cases on March 31 to 75,048 cases until May 13, 2020.

The outpatient department at our centre was reopened on 18 May 2020 with the aim to treat non COVID-19 ailments as the suffering of public due to non-COVID diseases was alarming. The hospital administration and the staff had to be geared up for the routine OPD care and simultaneously were to be protected from the risk of infection. A standard operating procedure (SOP) was conceptualized for the management of the outpatient services at our hospital using the guidelines issued by WHO, Ministry of Health and Family Welfare, central pollution control board and Indian Council for Medical Research. These are being followed till date with minimal risk of infection to the HCW.

These SOPs are useful for primary healthcare physicians where they can address the concerns of the non-COVID diseases with minimal occupational hazard even after the resurgence of new strain of COVID-19 virus.

**Study Design**

A prospective observational study was conducted from May 2020 to November 2020 at PGIMER satellite centre, Sangrur for determination of outcomes of SOPs instituted for non-COVID-19 OPD in rural India.

**Materials and Methods**

Standard operating procedures were framed for initiating the OPD at Post Graduate Institute of Medical Education and Research (PGIMER) satellite center, Sangrur in North India. The guidelines issued by PGIMER Chandigarh, Ministry of Health and Family welfare, WHO and Central Pollution Control Board (CPCB) were followed and these were improvised according to the building structure and subtle changes to the already existing administrative framework were made [Figure 1]. These SOPs were approved by the hospital nodal officer and a team consisting of a microbiologist, hospital administration, surgery and supervisors for the HCWs was constituted for the implementation and checking the compliance of the patients and HCWs. The administrative changes ensured one way traffic of the patients and reduced the risk of crowding (committee cleared on 11/05/2020).

Figure 1: Diagrammatic representation of the outpatient department

**SOP for social distancing**

HCWs were informed about maintenance of social distancing as it is of utmost importance to prevent transmission. The persons should maintain a distance of at least 1 meter. Gathering of more than 5 people was not allowed. Markings were made on the floor to ensure effective distancing. Chairs were numbered for convenience and to avoid confusion for the sitting plan in the OPD waiting area.

**SOP for hand-washing**

Hand-washing was promoted at the entry of the individual to the hospital. Liquid soaps were provided at the entry. Alcohol based hand sanitizers were provided to the clinicians, radiology technicians and reception areas as movement of the staff in these areas is restricted. Sign boards for technique of handwashing were pasted in the campus and formal training of the HCW for proper handwashing practices were carried out before OPD was started.

**Personal protection equipment (PPE) and masks**

The use of PPE was rationalized based on the risk of the job assigned to the individuals. The risk and appropriate use of the equipment was based on the Ministry of Health and Family Welfare notification dated 01/05/2020. The use of PPE and various equipments provided to the HCWs are listed in Table 1.

Masks were provided to the HCWs and the patients. The patients who had a clean cloth handkerchief were allowed to cover their face using the same. Training of the staff was carried out for proper handwashing technique and the proper use of mask. Awareness posters for proper use of mask and handwashing techniques were pasted in the hospital premises [Figure 2].

**Screening of the patients**

Screening of the patients was carried out using infrared thermometer. The patients were then provided with a token number and sent to the screening area which was carried out by
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Table 1: Rational Use of Personal Protective Equipment

| Setting                                      | Activity                        | Risk       | Recommended PPE                                      | Remarks                                        |
|----------------------------------------------|---------------------------------|------------|-----------------------------------------------------|------------------------------------------------|
| Help desk/Registration counter               | Provide information to patients | Mild risk  | Triple layer medical mask, Latex examination gloves | Physical distancing to be followed at all times |
| Doctor’s chamber                             | Clinical management              | Mild risk  | Triple layer medical mask, Latex examination gloves | No aerosol generating procedures should be allowed |
| Chamber of Dental/ENT doctors/Ophthalmology doctors | Clinical management | Moderate risk | N-95 mask Goggles, Latex examination gloves + face shield | Aerosol generating procedures anticipated. |
| Pre-anesthetic check-up clinic               | Pre-anesthetic check up          | Moderate risk | N-95 mask Goggles* Latex examination gloves | Face shield, when a splash of body fluid is expected |
| Pharmacy counter                             | Distribution of drugs           | Mild risk  | Triple layer medical mask, Latex examination gloves | Frequent use of hand sanitizer is advised over gloves. |
| Sanitary staff                               | Cleaning frequently touched surfaces/Floor | Mild risk  | Triple layer medical mask, Latex examination gloves |                                                     |
| Routine Laboratory                           | Sample collection and transportation and testing of routine (non-respiratory) samples Respiratory samples | Mild risk  | Triple layer medical mask, Latex examination gloves |                                                     |
| Radio-diagnosis, Blood bank, etc. CSSD/Laundry | Imaging services, blood bank services etc. Handling linen | Mild risk  | Triple layer medical mask, Latex examination gloves |                                                     |

Figure 2: Informative material pasted in the OPD

a nursing officer. Pulse rate, blood pressure was noted, SpO2 was monitored and other relevant history like respiratory difficulties, cough, sore throat and myalgia were also asked and entered. The patients were then asked to wait in the waiting area and were made to sit on the chair specified by the token number. The patient then proceeds to the registration counters and registration was made and the OPD ticket was carried by the HCW to the consultation rooms. The patients wait in the consultation area against the token number issued to them. These patients undertook the lab investigations in the area specified for the purpose and then were made to exit from a different area. The unidirectional flow of the patients was followed and reentry if required was carried out in the same pattern. The flow chart of the patient workflow is shown in Figure 3.
Cleaning and disinfection

Cleaning and disinfection are of prime importance for the regular maintenance of the OPD. Appropriate strategies of cleaning agents and contact times were taught to the HCWs and their compliance was ensured. Split air conditioners were used wherever required. Central air conditioning system was switched off. Windows and doors could be opened for proper ventilation of the rooms. All computers, electronic equipment were covered and covers were disinfected after every use. After wearing PPE, the cleaning staff was advised to use sodium hypochlorite with a minimum contact time of 10 minutes. Wipes were advised instead of sprays as disinfection with the use of sprays is uncertain and leads to production of aerosols. The method of preparation and use of sodium hypochlorite are shown in Tables 2 and 3.

Linen infection control SOP

The HCWs were advised to never carry soiled linen against the body and to place soiled linen in a leak-proof bag or a bucket after wearing proper PPE. They were further advised to empty the drum and soak linen in 0.1% sodium hypochlorite for approx. 30 minutes and to use a stick to stir and avoid splashing. The washed linen was rinsed with clean water and let dry fully in bright sunlight.

Management of spills

The spills of blood and excreta were managed by the sanitation workers. They were asked to cordon off the area and wear proper PPE. The spills were covered with paper or mops till it was soaked fully by the dry paper. The mops were cleaned up and discarded in the yellow bag. The area was sanitized with 1% hypochlorite solution and a contact time of 20 minutes was allowed. The area was mopped clean after 20 minutes and the PPE was discarded as per protocol.

Laboratory SOP

The clinicians were advised to order investigation if only important. After making the payment the patients were made to wait in the Waiting Area 4 and the samples were collected only by a trained laboratory technical staff member. The sample containers were labeled before the collection and vacutainers were used for blood collection. The HCWs were advised the use of
PPE before collection, packaging and transport of the samples. The details of storage, packaging and transport of the samples are shown in Table 4.

### Biomedical Waste Management

Standard color coding was used for collection of biomedical waste. The collection bins were disinfected using 0.5% sodium hypochlorite solution. The HCWs were advised to dispose goggles, plastic apron and gloves in the Red-bin whereas mask, gown, caps and shoe covers were disposed in the Yellow-bin. The non-infectious general waste was disposed in the Black-bag. The biomedical waste was daily carried and disposed by the agency designated by CPCB. The general waste was carried by the municipal corporation and disposed off in the area designated by the government.

### Results

A total of 9963 patients attended our outpatient services till November 2020 [Table 5]. The male to female ratio was 1.2:1. Majority of the non-COVID patients attended for general physician consultations. Surgical consultations were sought for non-healing wounds, follow-up of surgical procedures and for follow-up of malignancy patients, as these patients were unable to commute to oncolgical centers for follow-up.

Ophthalmology consultations were sought by 1464 patients. The slit lamp used for examination was covered and a partition was made between the patient and the consultant. Common gynecology ailments like menstrual irregularities, pelvic inflammatory diseases and gynecological malignancies were also treated. Relevant hematological and biochemical investigations were ordered for these patients and these were carried out following all the strict protocols laid up for the purpose. A total of 70 patients were referred to a COVID-19 testing facility during screening as these had symptoms like cough with fever. The data of their COVID-19 tests and further follow-up could not be traced.

After following these protocols, the HCWs at our center were at risk of contracting the COVID-19 infection. There were 5 incidences of COVID-19 positive cases among the HCWs at our center till November 2020. In the last week of August after 2 months of reopening, one of our registrations counter staff was symptomatic with COVID-19 symptoms. Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) was performed and he was found positive. Due to this RT-PCR was carried out on 130 staff members working at this centre. Two more staff members; one working at registration counter and other working as plumber were found positive during these tests. They were home isolated and were quarantined as per the existing government norms. There was a similar report of a radiographic technician who contracted the disease from her husband. She was

#### Table 2: The Method of Bleach Preparation

| Bleach Solution               | Dilution | Preparation                                                                 | Chlorine (PPM) |
|------------------------------|----------|-----------------------------------------------------------------------------|----------------|
| Neat (5%) (5.25-6.15%)       | None     | -                                                                           | 50000          |
| 0.5% of Sodium Hypochlorite  | 1:10     | 1 volume of neat +9 volumes of cold tap clean water                        | 5000           |
| 0.05% of Sodium Hypochlorite | 1:100    | 1 volume of neat +99 volumes of cold tap clean water                       | 500            |
| 1% of Sodium Hypochlorite    | 1:5      | 1 volume of neat +4 volumes of cold tap clean water                        | 10000          |
| 0.1% of Sodium Hypochlorite  | 1:50     | 1 volume of neat +49 volumes of cold tap clean water                       | 1000           |

#### Table 3: The Process of Disinfection Followed in the Outpatient Department

| Disinfectant                        | Contact time | Frequency               |
|-------------------------------------|--------------|-------------------------|
| High touch surfaces                 | Sodium hypochlorite (0.5%) (wipe) | 10 min | Hourly |
| Floor                               | Clean (soap & water) and then sodium hypochlorite (0.5%) mop | 10 min | Once/shift (8 hourly) |
| Wall, ceiling                       | Sodium hypochlorite (0.5%) spray | 10 min | Once daily |
| Linen (used)                        | Hypochlorite 0.1% | 30 min | As on when |
| Toilet                              | Clean (soap & water) and then Lysol 7%(wash) or Hypochlorite 0.5% (wash) | 10 min | Hourly |
| Non-critical equipment (stethoscope, BP cuff, thermometer etc) | Alcohol wipes | After each use |
| Slippers                            | Soap and water first and then with Hypochlorite 0.1% (dip) | 10 min | Once daily |

#### Table 4: The Collection, Transport and Processing of Laboratory Samples

| Specimen type | Collection Materials | Transport to Lab | Process in Lab | Storage till Testing if Needed |
|---------------|---------------------|------------------|----------------|--------------------------------|
| Whole blood   | Collection tube     | Immediately      | Same day       | <= 5 days - 4°C                |
| Stool         | Stool container     | Immediately      | Same day       | <= 5 days - 4°C                |
| Urine         | Urine collection container | Immediately | Same day       | <= 5 days - 4°C                |
The emergence of COVID-19 pandemic has put lot of stress on the healthcare system of the country. While most of the effort was to control the transmission of the infection by measures such as a lockdown and limiting the human movement, efforts were also made to strengthen the health care delivery system in the country. Various governments at state level instituted the guidelines and many COVID-19 care centers for isolation, quarantine and tertiary treatment were set up.\textsuperscript{[13]} The stress of the healthcare machinery on the pandemic control, isolation and treatment affected the delivery of care to the patients with chronic, benign and otherwise treatable disorders.\textsuperscript{[8]} The requirement of the healthcare facility for these chronic conditions was ever increasing during the lockdown and as the cases with active COVID-19 infection kept on rising. Our centre offering only outpatient services since 2016 was reopened in May 2020 with an intent to help the general population with these disorders.

Tele-consultations though effective lack physical touch and affection that a physician offers to these patients.\textsuperscript{[14]} The risk of infection in a crowded place and need to segregate the patients with COVID-19 symptoms led the administration of the hospital to frame these standard operating procedures.

The patients managed at the center primarily sought advice for non-communicable diseases and as a part of follow-up for malignancy. These patients were anxious to attend outpatient services and attendance was low in the initial days. These patients also had the apprehension of being isolated at the COVID-19 facility nearby if they screened positively with symptoms of COVID-19. But as the news of reopening of the center rolled out in the community, attendance of these patients kept increasing. Our hospital, being the peripheral branch of a large tertiary care center commands ethical, technical and infrastructural superiority over other hospitals in this region.

The low rate of infection among the HCWs and ability of this center to cater to a large rural population (approx. 20 lakhs) with a radius of 13 kilometers defines the effectiveness of these SOPs. The SOPs can also be followed at other centers in a rural setting where the risk of transmission is already low due to the less population density, thus further reducing the risk of occupational hazard. This also reduces the burden on tertiary care hospitals where the machinery could be diverted towards intensive care. The need of such outpatient center becomes more relevant in low-income countries where integrated medical services are lacking and more so during such a pandemic.\textsuperscript{[15]}

To best of our knowledge, this is first paper describing the standard operating procedures and their effectiveness for running an integrated medical center in rural India during COVID-19 pandemic. Individual departmental SOP though effective,\textsuperscript{[16]} a practical and reproducible SOP is the need of the hour for efficient delivery of non-COVID outpatient services during this pandemic in low resource areas.
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stabilization of the primary healthcare system is the need of hour more so after this pandemic.

**Ethical approval**

The SOP were approved by the committee vide letter no PGI/SANGRUR/20/861A dated 11May 2020.

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Nil.

**Conflicts of interest**

There are no conflicts of interest.

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