

Effect of COVID-19 Pandemicon Surgical Practice-An Indian Perspective

Vinodini C¹, Binu MG^{2*}

¹Assistant Professor, Department of Surgery, Coimbatore Medical College Hospital, Coimbatore, India

²Consultant Physician, Department of General Medicine, GKNM Hospital, Coimbatore, India

***Address for Correspondence:** Dr. Binu MG, Consultant Physician, Department of General Medicine, 41, 4th cross, Nethajinagar Extension, Nanjundapuram PO, Coimbatore, Tamilnadu- 641036, India

E-mail: dr.binumg@hotmail.com; dr.binumg@gmail.com

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ABSTRACT

Background: COVID-19 is currently a pandemic all over the world causing severe respiratory illness and death in many. Many of the affected individuals remain asymptomatic, yet potentially spreading the disease. The chance of such asymptomatic patients spreading the infection to the surgical team is high.

Methods: We did a systematic survey of literatures on web, looking at the articles about COVID screening and surgical recommendations. Total 22 articles with relevance to the topic were systematically analysed.

Results: Our study suggestions were delaying planned procedure when feasible, screening for COVID (RT PCR, clinical evaluation or other tests), use of PPEs, and possible use of negative pressure theatres.

Conclusion: The study concludes that all elective procedures are to be avoided unless it causes major hazards to the patient. Personal protection equipment and negative pressure theatres are recommended to reduce the spread of infection.

Key-words: Corona Virus, COVID-19, Indian scenario, Operation, SARS-CoV2, Surgical Practice

INTRODUCTION

COVID-19 or SARS CoV-2 originated from Wuhan city in China in December 2019^[1]. In January 2020, WHO issued Global health alert for a novel coronavirus outbreak and declared a pandemic on March 11/2020^[2,3]. The Indian Government announced a countrywide lockdown for three weeks, starting on midnight of March 24 to slow the spread of COVID-19, as the numbers in India reached 563^[4]. The lockdown was further extended. During the lockdown, out-patient clinics and elective surgical procedures were severely affected. The hospitals further faced financial difficulties as they had to acquire personal protection equipment and had to adapt to the new scenario. The decline in elective procedures was almost 100% in most centres^[5].

Surgeons are particularly at high risk of exposure to COVID-19 from out-patient clinics and operating theatres. Although surgeons are not frontline health workers, several series of infections emerged from operating theatres in China^[6]. Shortages of protective equipment and knowledge regarding COVID-19 are causing infections in healthcare workers. In Italy, 2026 (9%) of the COVID-19 cases (as of March 15) occurred in healthcare workers^[7].

In this study, we aim at analysing in the Indian perspective the pre-operative assessment and surgical care of patients undergoing elective procedures or trauma treatment.

MATERIALS AND METHODS

We surveyed literature by an online search. We primarily depended on PubMed. We also used Google Scholar and Scopus database. We also searched through the reference list of relevant papers.

The search words used were: SARS-CoV-2/ Coronavirus/ COVID-19, Surgery/ Operation/ Surgical practice and India/ Indian.

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A total of 210 articles were obtained from PubMed search and further 15 were identified from other sources, after excluding repetitions. All the articles were screened by at least one author and all the articles which did not have relevance to the Indian scenario were excluded. A total of 22 articles were identified for the review. This included 9 review articles, 4 guidelines/ advisory, 3 correspondences, 2 editorials, one case report, 2 original articles, and one unclassified one.

The article was considered relevant if,

1. It was related to COVID-19
2. was related to surgical practice or surgery; and
3. It was discussing the Indian scenario.

Papers discussing management protocols or papers, which discussed drugs or other treatment procedures were excluded.

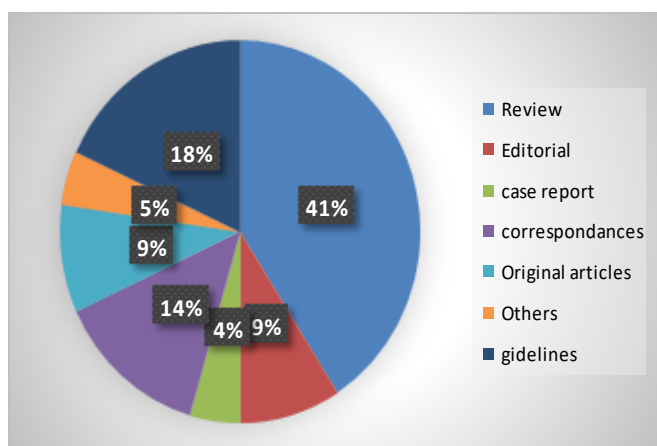


Fig. 1: Articles selected for final systematic review

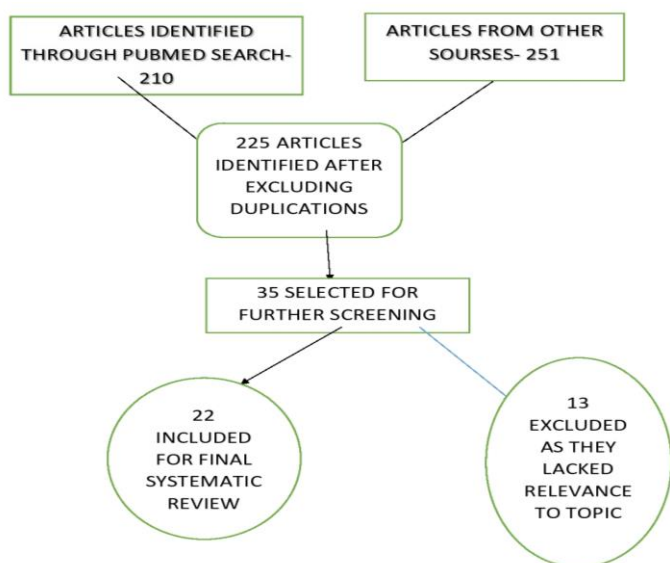


Fig. 2: PRISMA Flow Chart of data collection

RESULTS

Records- Out of the 210 articles found in the initial PubMed search and 15 obtained from alternate sources, twenty-four were selected for further analysis. After a systematic evaluation twenty-two were included for the review. Of these 22, nine were review articles, four were guidelines/ advisories, three were correspondences, two were editorials, two were original articles and one was a case report. One was simply classified as an article. Most articles were related to surgical procedures, though two articles were related to endoscopic procedures.

COVID-19 Screening- Some kind of screening was advised for all patients undergoing surgery or endoscopy or trauma patients in 20 out of 22 articles. Eight recommended clinical assessment and testing with RTPCR or other tests as needed depending on the level of suspension. Six articles recommended doing RT PCR for all the patients undergoing elective procedures. Two recommended RT PCR and Chest X-Ray or CT scan for all surgical patients. One study recommended Chest-X ray with or without CT scan as screening. Two articles suggested clinical evaluation only. One author suggested tele screening and avoiding contact if suspected. It can be concluded that the majority opined using clinical evaluation with or without RT PCR or Chest X-ray or CT scan as a test for COVID before procedures. There was concern about false-negative RT PCR reports and the time delay in obtaining RT PCR reports.

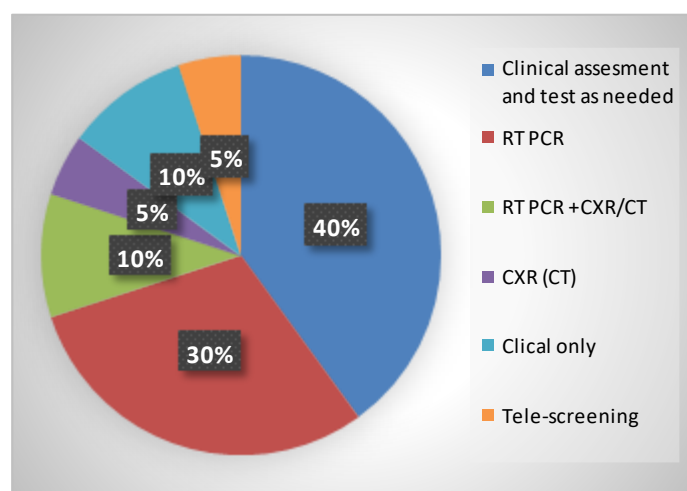


Fig. 3: COVID-19 screening by different-different instruments

Surgery and Operating atmosphere recommendations- Majority recommended avoiding elective or non-essential procedures during pandemic (14/22). Personal

protection equipment was recommended by eighteen articles in all surgical or endoscopic procedures during the pandemic. Five authors recommended negative pressure operation theatres to reduce exposure. Risk stratification by history and clinical evaluation and triaging of patients were recommended by five authors. Many felt that all cases should be considered positive unless otherwise proved during the pandemic.

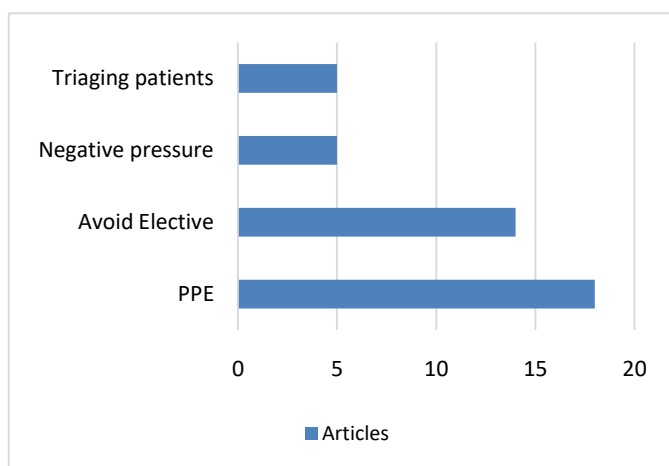


Fig. 4: Surgical Atmosphere recommendations

DISCUSSION

Coronavirus-19 belongs to the genus beta Coronavirus of Coronavirus family. The subgroups of the coronavirus family are alpha (α), beta (β), gamma (γ) and delta (δ) coronavirus [8]. SARS CoV is an envelope, single-stranded RNA virus [9]. Four of these viruses cause the common cold, while two previously known strains of zoonotic origin, caused Severe Acute Respiratory Syndrome (SARS_CoV) and Middle East Respiratory Syndrome (MERS-CoV), which were known to produce fatal disease [10]. The present virus- SARS CoV2, also known as 2019 nCoV is a newly evolved species, which originated in Wuhan, China and spread all over the world [11].

COVID-19 is a respiratory illness which can range from asymptomatic infection to respiratory distress and multi-organ failure. The symptoms may include loss of taste and smell, rhinitis, headache, cough, fever, body ache and gastrointestinal symptoms [12]. Patients with co-morbidities like diabetes, hypertension, cardiac, renal or hepatic issues or respiratory issues and elderly individuals had a worse outcome.

Direct contact transmission and droplet infection or aerosolizations are two major transmission methods identified in COVID-19 infection. The virus remains viable for varying periods, depending on the type of surface,

ranging from hours to days [13]. Since droplet is the major form of transmission, it tends to settle on surfaces in a short form from the origin (source patient). This forms the basis of social distancing practice. Procedures which are likely to produce aerosolisation like endotracheal intubation, bronchoscopy or even nebulisation can result in an increased risk of disease spread [14].

The emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) brought with its rapid development of both molecular and serologic assays for identification of COVID-19 infections [15]. Early diagnosis of the infection is very important to prevent further spread of infection and containment. Those patients presenting with severe symptoms and signs are likely to develop complications and succumb. In areas with local spread, any patient with acute respiratory illness, i.e., fever, cough and/or dyspnoea, should be a "Suspected Case" [16]. Confirmed case was a person with laboratory confirmation of SARS CoV2 by reverse transcriptase polymerase chain reaction (RT PCR) [17].

Spallanzani guidelines [16] stress the importance of Chest radiograph in the diagnosis and follow up of SARS CoV2 infection. CT scans can be useful in early diagnosis of COVID-19 even when the RT PCR is delayed or is a false negative. The sensitivity of CT scan in diagnosing COVID-19 was 98% in comparison with RT PCR sensitivity of 51%–71% [18].

Role of pre-operative screening for SARS-CoV-19 during a pandemic is well recognised in COVID literature. The most common recommendation is to screen with RT PCR though other recommendations included screening with clinical assessment, temperature measurement, chest CT, and measurement of immune cells in blood etc [19]. From the surgeon's perspective, more than fifty per cent of participants in an Indian survey felt that rapid antigen tests have about 30% false-negative results.

Since a large proportion of SARS-CoV2 infected people are asymptomatic, many of the patients reporting for surgery, who are symptom-free and 'normal' by clinical evaluation, could be asymptomatic carriers of the disease, who can spread it to the surgeon and other supporting staff, if not properly handled. There is a lot of data showing the transmission potential of asymptomatic and pre-symptomatic patients of COVID-19 [20]. Surgical patients have a high potential of transmission of the disease to health care workers (HCW) as they are in close contact with the HCW and

many of them are subjected to aerosol producing procedures. There is also prolonged exposure by the length of the surgery, hence increasing transmission potential. Since about 50% of patients in the pandemic are asymptomatic, the chance of an asymptomatic or pre-symptomatic patient developing a surgical problem is not rare.

Surgical smoke produced by ultrasonic scalpels and similar instruments is at a lower temperature, conducive for viral transmission^[21]. Laparoscopic procedures in a CoV2 positive patient can cause a large quantity of virus rich smoke getting accumulated in the pneumoperitoneum, which when suddenly released postoperatively, can result in a high chance of disease spread^[22].

CONCLUSIONS

Our most important conclusion from this review is that all elective procedures, which can be delayed without much patient morbidity and mortality should be postponed, knowing very well that it may take 3 to 6 months for the health care situation to stabilize or return to normal. We also conclude that all surgical cases should be screened for COVID-19 with preference given to clinical assessment and RT PCR test, complemented by radiological evaluation as needed.

Regarding surgical practice, we believe that proper Personal Protection Equipment should be worn by the surgeon and his team. The surgical time should be kept at minimum possible without compromising the procedure. The number of people present in the theatre should be kept minimum for the procedure. A negative pressure operation theatre is desirable as it can reduce the risk of disease transmission.

CONTRIBUTION OF AUTHORS

Research concept- Dr. Vinodini C

Research design: Dr. Vinodini C, Dr. Binu MG

Supervision: Dr. Vinodini C

Materials: Dr. Vinodini C, Dr. Binu MG

Data collection: Dr. Vinodini C, Dr. Binu MG

Data analysis: Dr. Vinodini C, Dr. Binu MG

Interpretation- Dr. Vinodini C, Dr. Binu MG

Literature search: Dr. Binu MG, Dr. Vinodini C

Writing article: Dr. Binu MG, Dr. Vinodini C

Critical review- Dr. Vinodini.C, Dr. Binu MG

Article editing- Dr. Binu MG

Final approval- Dr. Binu MG, Dr. Vinodini C

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