Navigating COVID-19 Treatment: CT Scans, Steroids, and Medical Practice Challenges in India

Jayanthi E [1*], C. Elayaraja [2], Priyadharshini S [2], Ashok kumar M [2]

Abstract

India is facing a severe challenge with the second wave of COVID-19, surpassing two crore cases. Individual treatment varies based on infection severity, with guidelines from the Indian Council for Medical Research (ICMR) advising against unnecessary RT-PCR testing, even for interstate travelers. However, the indiscriminate use of CT scans and steroids poses risks, cautioned by experts like Dr. Randeep Guleria. Overuse of CT scans, equivalent to 300 X-rays, leads to radiation exposure and potential cancer risks. Steroids, beneficial in severe cases, are misused in mild infections, increasing susceptibility to fungal infections. Balancing timely intervention and avoiding undue harm is crucial. Additionally, curbing reliance on costly and unnecessary tests like CT scans and IL-6 tests is essential to prevent patient confusion and long-term health risks.

Keywords: COVID-19, India, RT-PCR testing, CT scans, Steroids, Medical guidelines

Significance | The review highlights India's struggle with COVID-19, emphasizing the need for tailored treatments amid rising cases, cautioning against unnecessary tests and misuse of medications.

*Correspondence. Jayanthi E, Mohamed Sathak AJ College of Engineering, Chennai 603103
E-mail: headprojects@msajce-edu.in

Editor Mohamed Khadeer Ahamed Basheer And accepted by the Editorial Board Feb 14, 2024 (received for review Dec 10, 2023)

Introduction

India is experiencing a significant surge in COVID-19 cases, surpassing 20 million infections. The government has implemented measures to prevent panic and mitigate the strain on medical services to address this alarming situation and alleviate public concern. However, once individuals contract the virus, there is widespread confusion regarding the appropriate course of action. The severity of the illness varies for each person, necessitating tailored treatment approaches.

In response to the escalating situation, the Indian Council for Medical Research (ICMR) has advised against conducting RT-PCR testing for healthy individuals traveling between states. This recommendation aims to reduce the burden on testing facilities, as supported by WHO (2021), Su et al. (2020), and Yuan et al. (2020). Additionally, the ICMR guidelines emphasize that individuals who have already tested positive should not undergo repeat RT-PCR testing. Moreover, companies must adhere strictly to COVID-19 regulations. Furthermore, the states are urged to effectively enhance mobile testing mechanisms to manage the ongoing crisis. These guidelines are intended to streamline testing procedures and optimize resource allocation during this challenging period.

Caution Urged: Radiation and Medications

Doctors, including Dr. Randeep Guleria, the Director of the All India Institute of Medical Sciences (AIIMS) and a COVID-19 National Task Force member, advise caution regarding radiation exposure, especially for individuals with minor symptoms. Dr. Guleria expressed concern over the indiscriminate use of CT scans for diagnosing COVID-19, particularly in the early stages when physicians explore various treatment protocols. This overreliance on CT scans exposes individuals to unnecessary radiation, which

Author Affiliation.
[1] Mohamed Sathak AJ College of Engineering, Chennai 603103

Please cite this article.
Jayanthi E, C. Elayaraja, Priyadharshini S et al., (2024). Navigating COVID-19 Treatment: CT Scans, Steroids, and Medical Practice Challenges in India, Journal of Angiotherapy, 8(2), 1-4, 9459

could have long-term adverse effects. Dr. Guleria highlighted that the radiation exposure from a single CT scan is equivalent to approximately 300 X-rays, increasing the risk of cancer later in life, particularly for young individuals.

Moreover, physicians and the World Health Organization (WHO) caution against the indiscriminate use of corticosteroids like dexamethasone in treating COVID-19 patients with non-severe symptoms. While corticosteroids have shown efficacy in treating severe infections, their use in mild cases may not be warranted, according to WHO guidelines (2021). Therefore, it is crucial for medical practitioners to carefully assess the risk-benefit ratio before prescribing corticosteroids to COVID-19 patients with less severe symptoms.

COVID-19 Diagnosis: RT-PCR vs. CT Scans

The gold standard for diagnosing COVID-19 is the RT-PCR test, with CT scans reserved for specific cases where traditional symptoms are present but the RT-PCR result is negative or for assessing complications like thromboembolism or pneumomediastinum in individuals with mild or severe illness. However, the routine use of CT scans in COVID-19 diagnosis and management is not recommended, as it accounts for less than 2% of cases and may not significantly impact treatment decisions. Instead, oxygen saturation levels should guide treatment decisions, with CT scans primarily reserved for patients with worsening respiratory symptoms or moderate to severe clinical characteristics indicating pneumonia. While CT scans were initially used to assess pneumonia severity in COVID-19, their routine use is discouraged due to limited value in early stages and the potential for overuse.

The primary method for diagnosing COVID-19 is through RT-PCR testing, while the use of CT scans should be reserved for specific cases where individuals exhibit typical symptoms but test negative on RT-PCR, or to assess complications like thromboembolism or pneumomediastinum in those with mild or severe illness (Hu et al., 2020). Although there are situations where CT scans may be warranted, such as when patients have COVID-19 symptoms but negative RT-PCR results, routine use is discouraged. CT scans are not recommended in early COVID-19 stages, as they may not significantly impact treatment decisions and can lead to overuse (Gong et al., 2020). Instead, oxygen saturation levels should guide treatment decisions, with imaging recommended for patients with worsening respiratory symptoms or moderate to severe pneumonia indications (Gong et al., 2020).

Optimizing Chest CT Scans Safely

To minimize errors caused by patient movement, it's recommended to perform chest CT scans using a single-phase, low-dose protocol with quick scan methods. Routine multi-phase chest CT scans are not indicated for COVID-19 patients with pneumonia (Singh et al., 2020). Dr. Gulerija highlighted that a single CT scan is equivalent to about 300 to 400 chest X-rays, posing a long-term cancer risk, especially for children, according to the International Atomic Energy Agency. Studies suggest that CT exams contribute to a percentage of cancer cases, with estimates ranging from 1.5% to 2% (New British Journal of Medicine, 2007). Furthermore, the risk of transmission and contamination to COVID-19 patients during diagnostic imaging, particularly in enclosed settings, cannot be overlooked (Wang et al., 2020).

Steroid Use in COVID-19

Steroids are crucial for treating inflammatory conditions in severe COVID-19 cases, but their early and incorrect use can pose more risks than benefits by suppressing the immune system. Studies, such as those by Li and Ma (2020), highlight the importance of timing when administering steroids, as premature use before oxygen saturation drops can worsen outcomes, leading to increased mortality rates. Steroids should not be given on day 1 of illness; they are most effective when oxygen levels decrease in moderate to severe cases. Early steroid administration may even exacerbate viral replication, while high doses can worsen viral pneumonia in moderate cases. According to research by Saghazadeh and Rezaei (2020) and Zhai et al (2020), steroids should be avoided in the first five days of infection to prevent adverse effects.

The utilization of corticosteroids like dexamethasone in treating COVID-19 patients has been a subject of considerable interest and debate among healthcare professionals, particularly in India. While many doctors in India began using corticosteroids early in the pandemic based on clinical experience and previous research findings, formal guidelines from the World Health Organization (WHO) were only established in September 2020, prompted by the UK Recovery Study, which demonstrated the mortality benefits of steroids in COVID-19 patients.

The rationale behind the use of corticosteroids lies in their ability to mitigate the cytokine storm, a severe immune response triggered by the SARS-CoV-2 virus that can lead to multi-organ syndrome and death in a significant number of patients (Li et al., 2020). By suppressing the immune system and reducing inflammation, corticosteroids like dexamethasone help prevent organ damage and improve patient outcomes. However, the timing of steroid initiation is critical, as initiating treatment too early may hinder the body's natural immune response and exacerbate viral replication (Zha et al., 2020).

WHO guidelines recommend administering steroids to COVID-19 patients with oxygen saturation levels below 94% and a resting breath rate below 24 per minute (Zha et al., 2020). Additionally, certain individuals who exhibit early signs of worsening, despite not having significantly low oxygen levels, may benefit from steroid treatment. Innovative approaches such as the Kerala guidelines

emphasize the importance of recognizing exercise-induced desaturation, which can help identify patients at risk of hypoxemia and interstitial inflammation (Liu et al., 2020; Mazza et al., 2020).

Overall, while corticosteroids like dexamethasone are recognized as a powerful tool in combating COVID-19, their appropriate use requires careful consideration of factors such as timing, dosage, and patient selection. As our understanding of the disease evolves, it is essential for healthcare professionals to stay updated on the latest guidelines and evidence-based practices to optimize patient care.

Steroid Treatment: Benefits and Risks

Improper dosage, timing, and duration of steroid treatment can have harmful consequences, turning them into a double-edged sword. Steroids are not necessary for all individuals, particularly those with mild symptoms in the early stages of the disease. Instead, steroids should be administered based on exercise-induced desaturation, not solely based on the duration of illness.

Dr. Guleria recently highlighted instances where steroids were unnecessarily prescribed, leading to a decline in oxygen levels. Prolonged steroid use in severe COVID-19 cases may result in complications such as elevated blood glucose levels, requiring careful management with insulin to prevent additional bacterial or fungal infections.

Conclusion and Perspective

Amidst the ongoing surge of COVID-19 cases in India, patients find themselves increasingly confused and vulnerable. The management of the disease has become a complex landscape, with private practitioners often prescribing a plethora of medications, while the government tends to limit prescriptions to a select few instances, primarily for severe cases of COVID-19. Compounding this confusion are the numerous WhatsApp messages advocating for various home remedies, including traditional concoctions like kaadha, herbal compounds, and even medications like hydroxychloroquine, leaving patients bewildered and unsure of the best course of action.

This disparity between advice and treatment stems largely from India's sluggish therapy guidelines, which have created a void for physicians to fill. While the Union Ministry of Health provides a basic treatment plan on its website, crucial information regarding laboratory investigations, off-label usage cautions, and antibiotic and immunosuppressive prescriptions is often lacking. Moreover, the Ministry's failure to enforce strict compliance with these standards has allowed doctors to prescribe medications with inadequate evidence or negative proof, leading to widespread confusion and potentially harmful practices.

Despite major clinical trials showing no evidence of efficacy, antibiotics such as azithromycin and doxycycline continue to be widely prescribed for COVID-19 patients, contributing to the growing concern of antibiotic resistance. Additionally, medications like dexamethasone and methylprednisolone, which have shown benefits for severe cases, are sometimes inappropriately prescribed for mild cases, posing risks of complications such as infections and dysregulated blood sugar levels.

In addition to medication mismanagement, unnecessary diagnostic procedures, such as CT scans and blood tests, further exacerbate patient confusion and financial burden. Many private clinics rush patients into costly CT chest scans immediately after a positive COVID-19 test, despite the fact that substantial lung alterations detectable by CT scans typically occur later in the illness. These unnecessary scans not only strain patients' finances but also expose them to potentially harmful radiation, raising concerns about long-term health consequences such as an increased risk of cancer.

Looking ahead, there is a pressing need to streamline COVID-19 treatment protocols in India, emphasizing evidence-based practices and ensuring clear guidance for healthcare providers. Practical and cost-effective alternatives, such as chest X-rays instead of CT scans, should be promoted to reduce unnecessary expenses and radiation exposure. Furthermore, the appropriate use of blood tests to monitor disease progression and guide treatment decisions is crucial, with a focus on avoiding unnecessary tests that may lead to false positives and unnecessary anxiety for patients and their families. By addressing these issues, India can better navigate the challenges of COVID-19 treatment and improve outcomes for patients across the country.

In conclusion, the management of COVID-19 in India presents a complex challenge, with patients often feeling confused and disempowered amidst conflicting advice and treatment protocols. The discrepancy between private practitioners' prescriptions and government guidelines underscores the need for clearer, evidence-based protocols to guide healthcare providers. The misuse of medications, including antibiotics and steroids, poses risks of antibiotic resistance and adverse effects, particularly when administered inappropriately to mild cases of COVID-19.

Furthermore, unnecessary diagnostic procedures such as CT scans and blood tests contribute to patient confusion and financial strain, highlighting the importance of cost-effective alternatives like chest X-rays. Moving forward, there is a critical need for standardized treatment protocols, transparent communication from health authorities, and improved access to accurate diagnostic tests. By addressing these challenges, India can enhance the quality of care for COVID-19 patients and mitigate the risks associated with inappropriate treatments and diagnostic procedures.

Author contribution

J.E., C.E., P.S., A.K.M. conceptualized, reviewed the literature, and wrote the article.

Acknowledgment

None declared

Competing financial interests

The authors have no conflict of interest.

References

Bani-Sadr et al (2020). Corticosteroid therapy for patients with COVID-19 pneumonia: a before–after study. International Journal of Antimicrobial Agents, 56(2), 106077.

Gong et al (2020). Effects of methylprednisolone use on viral genomic nucleic acid negative conversion and CT imaging lesion absorption in COVID-19 patients under 50 years old. Journal of medical virology, 92(11), 2551-2555.

https://www.thehindu.com/sci-tech/health/explained-why-have-doctors-cautioned-against-misuse-of-ct-scans-and-steroids-to-diagnose-and-treat-covid-19/article34516623.ece

https://www.thehindu.com/specials/explained-ip-rights-and-vaccines-use-of-ct-scans-and-steroids-for-covid-19-and-supreme-court-ruling-on-identifying-backward-classes/article34517428.ece

Hu et al (2020). Clinical use of short-course and low-dose corticosteroids in patients with non-severe COVID-19 during pneumonia progression. Frontiers in public health, 8, 355.

Li and Ma (2020). Acute respiratory failure in COVID-19: is it "typical" ARDS?. Critical Care, 24, 1-5.

Li et al (2020). Efficacy evaluation of early, low-dose, short-term corticosteroids in adults hospitalized with non-severe COVID-19 pneumonia: a retrospective cohort study. Infectious diseases and therapy, 9(4), 823-836.

Liu et al (2020). Risk factors associated with disease severity and length of hospital stay in COVID-19 patients. Journal of Infection, 81(1), e95-e97.

Mazza et al (2020). A fatal case of COVID-19 pneumonia occurring in a patient with severe acute ulcerative colitis. Gut, 69(6), 1148-1149.

Saghazadeh and Rezaei (2020). Towards treatment planning of COVID-19: rationale and hypothesis for the use of multiple immunosuppressive agents: anti-antibodies, immunoglobulins, and corticosteroids. International immunopharmacology, 106560.

Singh et al (2020). Role of corticosteroid in the management of COVID-19: A systemic review and a Clinician's perspective. Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 14(5), 971-978.

Su et al (2020). Tailoring steroids in the treatment of COVID-19 pneumonia assisted by CT scans: three case reports. Journal of X-ray science and technology, (Preprint), 1-8.

Wang et al (2020). Early, low-dose and short-term application of corticosteroid treatment in patients with severe COVID-19 pneumonia: single-center experience from Wuhan, China. MedRxiv.

Yuan et al (2020). Effects of corticosteroid treatment for non-severe COVID-19 pneumonia: a propensity score-based analysis. Shock, 54(5), 638-643.

Zha et al (2020). Corticosteroid treatment of patients with coronavirus disease 2019 (COVID-19). Medical Journal of Australia, 212(9), 416-420.

Zhai et al (2020). The epidemiology, diagnosis and treatment of COVID-19. International journal of antimicrobial agents, 55(5), 105955.