This article can be cited as: Soltanabadi M, Hedayati R. Utility of 99mTc-MIBI myocardial perfusion imaging in the evaluation of cardiovascular complications in COVID-19 patients. Cardiovasc Biomed J. 2022; 2(2):1-2.

Original Article

Utility of 99mTc-MIBI myocardial perfusion imaging in the evaluation of cardiovascular complications in COVID-19 patients

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Article Information:
Received: 02 May 2022; Revised: 25 Feb 2023; Accepted: 05 Mar 2023 DOI: 10.18502/cbj.v2i2.12154

Abstract

The coronavirus disease is due to Acute Respiratory Syndrome Coronavirus2 (SARS-CoV-2). COVID-19 mainly affects the respiratory and immune systems and other organs like the cardiovascular and nervous systems, lungs, and kidneys (1). Several studies have reported COVID-19 patients with persistent symptoms for months after the initial phase. The most common symptoms are fatigue, headaches, cough, anosmia, arthralgia, and chest pain (2). Studies have shown this modality to diagnose, follow up, and evaluate response to treatment in chronic COVID-19 complications using 99mTc-MIBI myocardial perfusion single photon emission computed tomography (SPECT), pulmonary involvement with 99mTc-MAA perfusion lung scan, renal involvement with 99mTc-DTPA, and 99mTc-DMSA renal scintigraphy (3). Myocardial perfusion imaging with 99mTc-MIBI provides meaningful data to predict prognosis, risk of annual cardiac events, and evaluation of myocardium viability (4). Conventional SPECT Myocardial Perfusion Imaging (MPI) needs a viable metabolically active myocardial cell to extract the radiotracer. A review of articles shows that 99mTc-MIBI myocardial perfusion scintigraphy could be helpful in the timely acute myocardial infarction (MI) diagnosis and myocardial viability in COVID-19 patients. It is also beneficial in managing COVID-19 patients with heart failure by myocardial injury evaluation and choosing the best therapeutic choice, prognosis, and treatment response.

Keywords: COVID-19, Cardiovascular complications, 99m Tc myocardial perfusion scan, Heart failure

Materials and Methods

SPECT MPI provides tomographic images. First, the radiopharmaceutical should be delivered to the myocardium. Second, a viable metabolically active myocardial cell should be present to extract the radiotracer. Finally, a significant amount of the radiopharmaceutical should remain within the cell for imaging (4).

Discussion

Since pulmonary complications are the significant COVID-19 symptom, other complications, such as cardiovascular ones, could be missed; hence, the first responder of clinics must have adequate knowledge of the cardiovascular complications (3, 4). This brief report presents an overview of cardiovascular complications related to COVID-19 and how nuclear medicine imaging could be helpful for these complications management. According to the American College of Cardiology (ACC) statement, Percutaneous Coronary

Intervention (PCI) is the most common treatment method in COVID-19 patients with ST-elevation Myocardial Infarction (STEMI). Management of patients with COVID-19 and hemodynamically unstable NSTEMI is like those with STEMI (5).

Conclusion

In conclusion, a review of articles shows that 99mTc-MIBI myocardial perfusion scintigraphy could be helpful in the timely acute MI diagnosis and myocardial viability in COVID-19 patients. It is also beneficial in managing COVID-19 patients with heart failure by myocardial injury evaluation and choosing the best therapeutic choice, prognosis, and treatment response.

Further research is needed to help improve the effectiveness of this imaging.

Financial Competing Interest

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Authorship Contributions

All authors discussed the results and contributed to the final manuscript.

Conflicts of Interest

The authors reported no potential conflict of interest.

Acknowledgments

Not applicable

References

1.Deshmukh V, Motwani R, Kumar A, et al. Histopathological observations in COVID-19: a systematic review. *J Clin Pathol*. 2021;74(2):76-83.

2.Wang A,Thompson K , Choe E , et al. The Potential Roles of Nuclear Medicine in the Evaluation of Long Haulers from the COVID-19 Pandemic. *J Nucl Med*. 2021:62(1):2018.

3.Juengling FD, Maldonado A, Wuest F, et al. The Role of Nuclear Medicine for COVID-19: Time to Act Now. *J Nucl Med*. 2020;61(6):781-782.

4.O'Malley JP, Ziessman HA. Nuclear Medicine and Molecular Imaging: The Requisites e-book: *Elsevier Health Sciences*; 2020.

5.Welt FG, Shah PB, Aronow HD, et al. Catheterization Laboratory Considerations During the Coronavirus (COVID-19) Pandemic: from the ACC's Interventional Council and SCAI. *J Am Coll Cardiol*. 2020; 75(18):2372-2375.