ECRONICON OPEN ACCESS

EC MICROBIOLOGY
Editorial

# Sarcoidosis in Relation to COVID-19

**Attapon Cheepsattayakorn[1,2,3,4]*, Ruangrong Cheepsattayakorn[5] and Porntep Siriwanarangsun[1]**

*[1]Faculty of Medicine, Western University, Pathumtani Province, Thailand*

*[2]Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Bangkok, Thailand*

*[3]10th Zonal Tuberculosis and Chest Disease Center, Chiang Mai, Thailand*

*[4]Department of Disease Control, Ministry of Public Health, Thailand*

*[5]Department of Pathology, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand*

***Corresponding Author:** Attapon Cheepsattayakorn, 10th Zonal Tuberculosis and Chest Disease Center, Chiang Mai, Thailand.

**Received:** December 26, 2023; **Published:** January 02, 2024

Several post-COVID-19 inflammatory disorders and autoimmune diseases have been discovered [1] since global COVID-19 pandemic started [2]. Association between these diseases is still to be investigated [2]. Common genes between COVID-19 and sarcoidosis are demonstrated in figure 1 and 2 [3]. Nevertheless, sarcoidosis organ involvement, demographics, and type of sarcoidosis treatment at the time of COVID-19 diagnosis are related to hospital admission, non-invasive ventilation or high flow oxygenation, intubation [4]. A retrospective hospital-based cohort study of 585 French sarcoidosis patients in 2017, demonstrated an estimate of a 5% frequency of severe infections that resulting in hospital admission and death [5]. A typical HRCT feature in sarcoidosis is the presence of well-defined micronodules scattered along the broncho-vascular bundle, veins, fissures and pleura in a characteristic lymphatic distribution. Occasionally, "galaxy sign", a highly suggestive of pulmonary sarcoidosis (predominance of a mid-to-upper lung zones) may demonstrates conglomerate masses that are surrounded by a multitude of micronodules (Figure 3) [6].

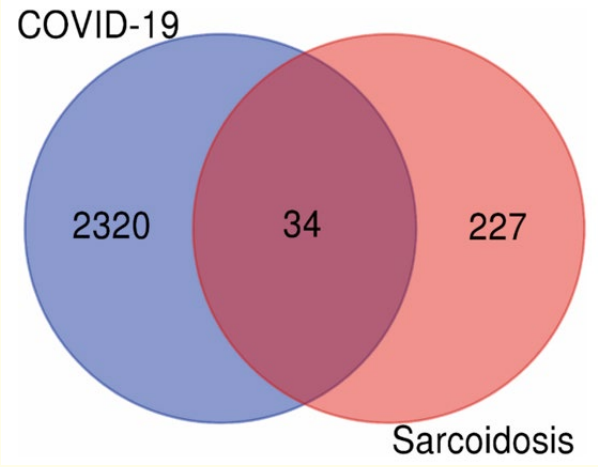


***Figure 1:*** *Demonstrating a Venn diagram of commonly differentially expressed upregulated genes. Common 34 upregulated genes were identified from 2320 upregulated genes of COVID-19 infection and 227 upregulated genes of sarcoidosis [3].*

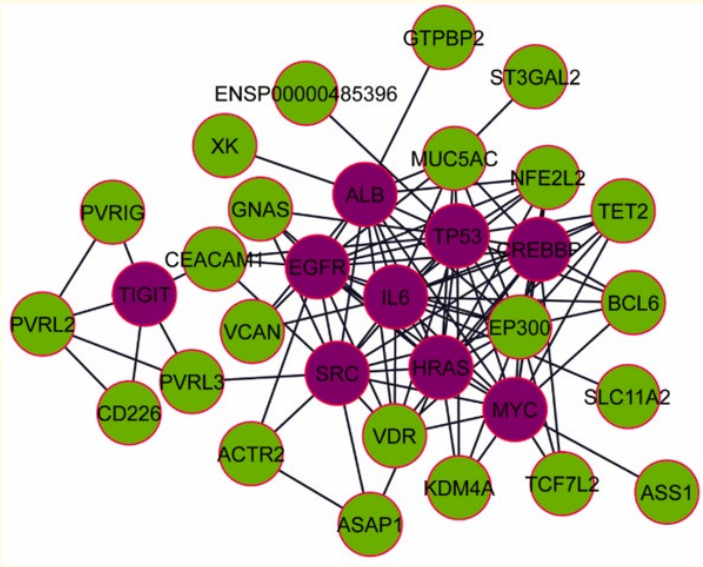


***Figure 2:*** *Demonstrating protein-protein interactions (PPIs) network for common upregulated genes from COVID-19 and sarcoidosis. The light green color nodes indicate common upregulated genes. Network consists of 32 nodes and 102 edges [3].*

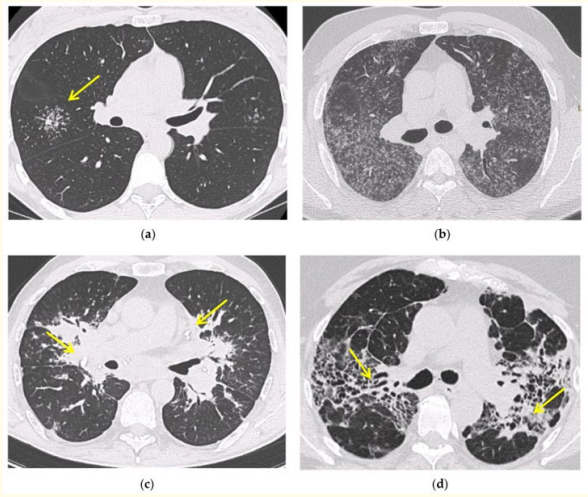


***Figure 3:*** *Demonstrating irregularly marginated nodule surrounded by multiple small nodules ("Galaxy sign", yellow narrow), this is typical of sarcoidosis (a); ground-glass-like increased attenuation resulting from diffuse micronodules randomly distributed ("Miliary sarcoidosis") (b); enlarged and partially calcified (yellow narrows) bilateral hilar lymph nodes (c); fibrotic sarcoidosis with cystic changes and traction bronchiectasis (yellow narrows) predominantly in the perihilar region and upper lobes. Nodular abnormalities are minimal/absent, but the appearance and the location of the fibrosis are very suggestive of the diagnosis of sarcoidosis (d) [6].*

Where VDR dominantly connected to 14 different kinds of drug, protein drug interaction network collected from DrugBank provides proper treatment. Vitamin D and some of its analogous compounds might play significant roles in modulating both COVID-19 and sarcoidosis conditions is indicated by this network (Figure 4) [3].

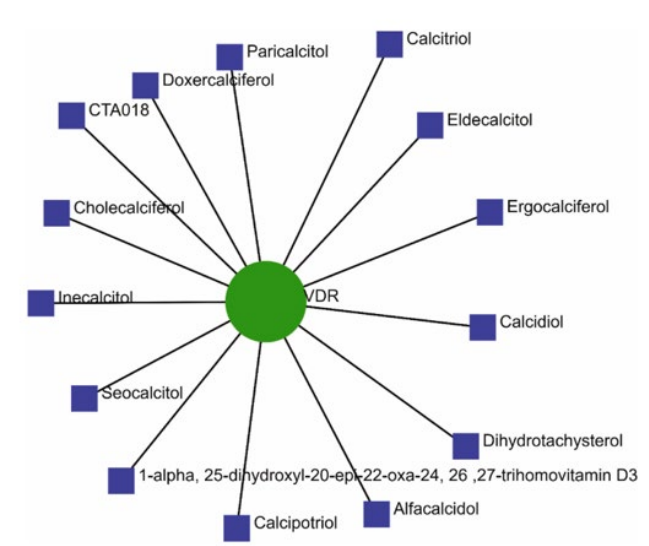


***Figure 4:*** *Demonstrating drugs protein interaction network [3].*

Besides sarcoidosis of lungs, symptomatic and accidental extrapulmonary sarcoidosis is also found around the world (Figure 5-7) [7-9].

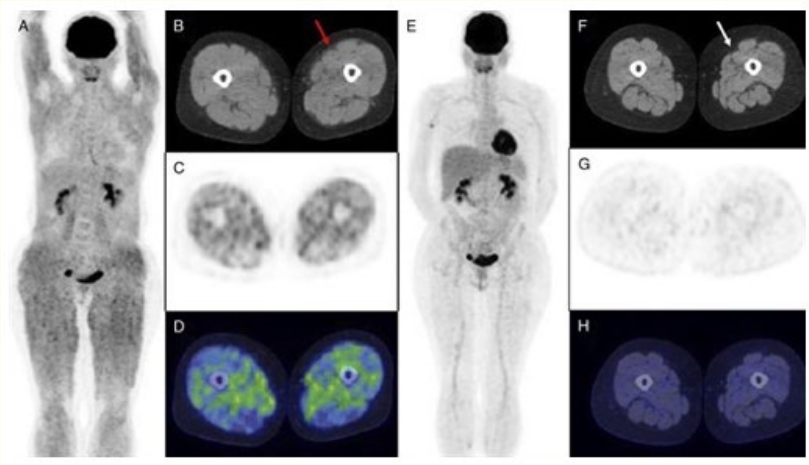


***Figure 5:*** *Demonstrating isolated muscular sarcoidosis, revealed by hypercalcemia and 18F-FDG PET/CT [7].*

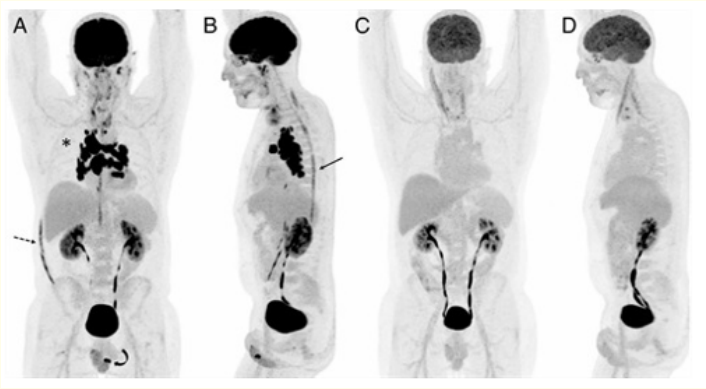


***Figure 6:*** *$^{18}$F-FDG PET/MRI for diagnosis and treatment efficacy evaluation of spinal sarcoidosis [8].*

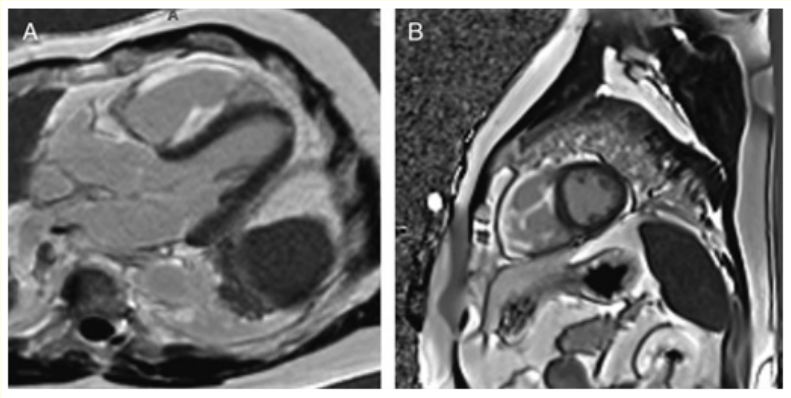


***Figure 7:*** *Demonstrating FDG PET of isolated right ventricular sarcoidosis [9].*

In conclusion, hub gene identification might have significant roles in modulating sarcoidosis and COVID-19 infection. In the literature, cases with sarcoid-like granuloma have been reported very few. Sarcoid-like immune response to COVID-19 could be noncaseating granulomas due to short time from disease to develop granuloma.

## Bibliography

1. Galeotti C and Baryl J. "Autoimmune and inflammatory diseases following COVID-19". *Nature Reviews Rheumatology* 16.8 (2020): 413-414.

2. Racil H., *et al*. "Can coronavirus disease 2019 induce sarcoidosis: a case report". *Thoracic Research and Practice* 24.1 (2023): 45-48.

3. Mogal R., *et al*. "Common genetic aspects between COVID-19 and sarcoidosis: a network-based approach using expression data". *Biochemistry and Biophysics Reports* 29 (2022): 101219.

4. Nadeem O., *et al*. "Outcome in patients with sarcoidosis diagnosed with COVID-19". Presentation at Chest 2021 annual meeting (2021).

5. Dureault A., *et al*. "Severe infections in sarcoidosis: incidence, predictors and long-term outcome in a cohort of 585 patients". *Medicine (Baltimore)* 96.49 (2017): e8846.

6. Bernardinello N., *et al*. "Pulmonary sarcoidosis: diagnosis and differential diagnosis". *Diagnostics (Basel)* 11.9 (2021): 1558.

7. Dhomps A., *et al*. "Isolated muscular sarcoidosis revealed by hypercalcemia". *Clinical Nuclear Medicine* 44.10 (2019): 824-825.

8. Ashjan K., *et al*. "$^{18}$F-FDG PET/MRI for diagnosis and treatment efficacy evaluation of spinal sarcoidosis". *Clinical Nuclear Medicine* 49.1 (2024): e28-e30.

9. Alan S and Dagmar HS. "FDG PET of isolated right ventricular sarcoidosis". *Clinical Nuclear Medicine* 48.2 (2023): 184-185.

**Volume 20 Issue 1 January 2024**