



Subacute Thyroiditis in the Time of COVID-19

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First reported in December 2019 in Wuhan, China, coronavirus disease 2019 (COVID-19) has spread rapidly around the world, resulting in 773,119,173 infections and 6,990,067 deaths by the end of December 2023 [1]. Although the primary symptoms of COVID-19 include fever, chills, and respiratory issues, the presence of angiotensin-converting enzyme 2 in thyroid cells [2] has been associated with the development of thyroid disease following COVID-19 infection [3]. Furthermore, there have been reports of thyroid disease occurring as a result of the COVID-19 vaccine [4].

Subacute thyroiditis (SAT) can develop following COVID-19 infection, as well as after receiving a COVID-19 vaccination. The clinical manifestations, which include neck pain, fever, and thyrotoxic symptoms, are similar to those of typical SAT. These symptoms usually appear about 28 days after COVID-19 infection [5,6] and approximately 10 to 14 days after COVID-19 vaccination (Table 1) [7,8].

In a recent study published by Lee et al. [9], the authors compared the incidence of SAT in patients with long COVID to a control group without COVID-19. The risk of SAT was 1.76 times higher in the long COVID group than in the control group. Interestingly, there was no significant difference in the risk of developing SAT between the control group and those with COVID-19 until 6 months post-infection or from the index date. However, after 6 months from the infection or index date, the risk of SAT in the COVID-19 group was 2.3 times higher than in the control group. These findings indicate that the risk of SAT following COVID-19 may persist and even increase in the long term, not just in the immediate aftermath of the infection.

However, the clarity of the study is hindered by the ambiguity surrounding the exclusion of participants who received the COVID-19 vaccine during the enrollment period. As a result, it is uncertain whether the SAT observed in this study is a complication of long COVID or a side effect of the COVID-19 vaccine. To resolve this ambiguity, data from the Korean Disease Control and Prevention Agency COVID-19-National Health Insur-

Table 1. Summary of Subacute Thyroiditis Following COVID-19 Infection and COVID-19 Vaccination from Systematic Reviews

Variable	COVID-19 infection [6]	COVID-19 vaccination [8]
No. of cases	100	86
Age, yr	42.70±11.85	41 (35–50)
Female sex	68 (60)	68 (80)
Onset of SAT from infection or vaccination (day)	28.31±36.92	10 (5–15)
Symptoms		
Neck pain	69 (69)	71 (83.5)
Fever	54 (54)	34 (40.0)
Palpitation	31 (31)	41 (48.2)
Tremor	8 (8)	6 (7.1)
Goiter	14 (14)	9 (10.6)
ESR elevation	82/83 (99)	63 (92.6)
Steroid treatment	62/99 (62.6)	42 (54.5)

Values are expressed as mean±standard deviation, median (interquartile range), or number (%).

SAT, subacute thyroiditis; ESR, erythrocyte sedimentation rate.

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ance Service (K-COV-N) cohort, which integrates information on Korea's COVID-19 cases, vaccination records, and National Health Insurance System, could be utilized for further analysis. By conducting an analysis that excludes vaccinated individuals from the cohort of the study of Lee et al. [9], we anticipate obtaining more definitive and accurate results regarding the risk of SAT following long COVID.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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REFERENCES

1. World Health Organization. WHO COVID-19 dashboard [Internet]. Geneva: WHO; 2023 [cited 2024 January 15]. Available from: <https://data.who.int/dashboards/covid19/cases?n=c>.
2. Rotondi M, Coperchini F, Ricci G, Denegri M, Croce L, Ngnitejeu ST, et al. Detection of SARS-COV-2 receptor ACE-2 mRNA in thyroid cells: a clue for COVID-19-related subacute thyroiditis. *J Endocrinol Invest* 2021;44:1085-90.
3. Scappaticcio L, Pitoia F, Esposito K, Piccardo A, Trimboli P. Impact of COVID-19 on the thyroid gland: an update. *Rev Endocr Metab Disord* 2021;22:803-15.
4. Jafarzadeh A, Nemati M, Jafarzadeh S, Nozari P, Mortazavi SM. Thyroid dysfunction following vaccination with COVID-19 vaccines: a basic review of the preliminary evidence. *J Endocrinol Invest* 2022;45:1835-63.
5. Christensen J, O'Callaghan K, Sinclair H, Hawke K, Love A, Hajkovicz K, et al. Risk factors, treatment and outcomes of subacute thyroiditis secondary to COVID-19: a systematic review. *Intern Med J* 2022;52:522-9.
6. Meftah E, Rahmati R, Zari Meidani F, Khodadadi S, Chitzan-Zadeh K, Esfahanian F, et al. Subacute thyroiditis following COVID-19: a systematic review. *Front Endocrinol (Lausanne)* 2023;14:1126637.
7. Popescu M, Ghemigian A, Vasile CM, Costache A, Carsote M, Ghenea AE. The new entity of subacute thyroiditis amid the COVID-19 pandemic: from infection to vaccine. *Diagnostics (Basel)* 2022;12:960.
8. Ganie MA, Rashid H, Qadir A, Bajaj S, Joshi SR, Kalra P, et al. Subacute thyroiditis after COVID-19 vaccination: a systematic review of the literature. *Thyroid Res Pract* 2022;19:24-41.
9. Lee J, Seo GH, Song K. Beyond acute COVID-19: investigating the incidence of subacute thyroiditis in long COVID-19 in Korea. *Endocrinol Metab (Seoul)* 2023;38:455-61.