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Thyroid

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Subacute Thyroiditis Following SARS-CoV-2 mRNA Vaccine

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Background: In 2011, Shoenfeld and Agmon-Levin described a distinct clinical entity called the autoimmune/inflammatory syndrome induced by adjuvants (ASIA). Adjuvants are primarily used in vaccines for directing the adaptive immune response. However, adjuvants sometimes trigger undesirable autoimmune effects, especially in genetically predisposed individuals such as those with DRB1 allele mutations. The mRNA vaccine may exert "self-adjuvant" properties through activation of tumor necrosis factor, interferon-alpha and other cytokines secreted by immune cells or cross reactivity of mRNA targeting CoV-2 spike protein with thyroid tissue antigens. With the recent widespread use of SARS-CoV-2 mRNA vaccine, cases of vaccine associated thyroid disorders are becoming more apparent. **Case Summary:** A 45-year-old male with well controlled hypertension and type 2 diabetes mellitus was evaluated for abnormal thyroid function tests with a TSH of 0.078 uIU/mL and Free T4 of 2.17 ng/dl. He reported a history of Hashimoto's chronic thyroiditis. He received the second dose of mRNA COVID-19 vaccine one month prior to presentation. He denied any change in the size of his thyroid gland. He also reported no local neck symptoms, dysphagia, odynophagia or change in voice. A nuclear thyroid uptake and scan showed mildly asymmetric thyroid lobes with markedly decreased 24-hour uptake of 0.7%. Based on his clinical presentation, labs and nuclear imaging he was diagnosed with painless thyroiditis. His thyroid function normalized to a TSH of 0.96uIU/ml and Free T4 of 1.29 ng/dl within 2 months without any intervention. There is a strong possibility that the SARS-CoV-2 vaccine

accentuated his underlying Hashimoto's chronic thyroiditis enough to cause this transient episode of painless thyroiditis, particularly considering the close interval between the vaccine and onset of his thyroid abnormalities.

Conclusion: Autoimmune thyroid abnormalities induced by vaccines have been historically associated with protein vaccines for protection from HPV, HBV, seasonal influenza, etc. The spectrum of these disorders can potentially manifest as a transient side effect or even years later with non-specific findings. The SARS-CoV-2 mRNA vaccine may incite similar immunogenicity though yet unestablished, and physicians should be mindful of this phenomenon. Due to limited data, more rigorous studies are needed to fully understand the underlying pathogenesis of thyroiditis following SARS-CoV-2 vaccine in future. As there have been minimal cases of thyroiditis reported, SARS-CoV-2 vaccine should still be strongly recommended.

References Bragazzi NL, Hejly A, Watad A, Adawi M, Amital H, Shoenfeld Y. ASIA syndrome and endocrine autoimmune disorders. *Best Pract Res Clin Endocrinol Metab.* 2020 Jan;34(1): 101412. doi: 10.1016/j.beem.2020.101412. Epub 2020 Mar 11. PMID: 32265102.

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