

Tozinameran

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Exacerbation of subclinical hyperthyroidism: case report

A 64-year-old woman developed exacerbation of subclinical hyperthyroidism following administration of tozinameran for covid-19 immunisation.

The woman had a medical history of diabetes mellitus, colorectal cancer and obesity. On April 24 (day 0), she had received the first dose of the tozinameran [BNT162b2 mRNA COVID-19 vaccine]. She had never documented with abnormal thyroid function until COVID-19 vaccination was administered. On day 1 from receiving first dose of vaccine, she developed a mild fatigue, low-grade fever and pain at the injection site in the left upper arm. On day 2 from receiving first dose of vaccine, those symptoms disappeared. On day 4 from receiving first dose of vaccine, even on a flat road, she developed increasing shortness of breath. On day 6 from receiving first dose of vaccine, she visited the emergency department in Japan on account of worsening respiratory distress, palpitations, edema of both lower legs, decreased urine output and a fever of 38.0 °C. Initial examination revealed a blood pressure of 161/87 mm Hg, oxygen saturation of 94% on room air and a pulse rate of 137/min. Her consciousness was clear. Electrocardiogram revealed atrial fibrillation, and chest X-ray showed infiltrations in both lung fields. Thereafter, a diagnosis of heart failure complicated with atrial fibrillation was established. Therefore, immediately, she was hospitalized. Blood examination after admission revealed an elevated serum levels of free triiodothyronine (ft3) 23.2 ng/dL and free thyroxine (ft4) 3.32 ng/dL with suppressed serum levels of thyroid stimulating hormone (TSH) < 0.008 mIU/mL. TSH receptor antibody was positive (33.8 IU/L). Ultrasonography of the thyroid gland showed the presence of goiter lesions. Colour Doppler ultrasonography revealed an increase in vascularization of the parenchyma. The real-time reverse transcription polymerase chain reaction of nasopharyngeal swab for SARS-Cov-2 testing revealed negative results. Finally, a diagnosis of having a thyrotoxic crisis (exacerbation of subclinical hyperthyroidism) complicated with atrial fibrillation, and heart failure was made. Acute physiology and chronic health evaluation II revealed a score of seven.

Thereafter, the woman's treatment was started with potassium-iodide/iodine [potassium iodine], thiamazole, unspecified corticosteroid, furosemide and carvedilol. Thereafter, her general condition improved rapidly, and at day 11 from receiving first dose of vaccine or five days after admission her respiratory distress disappeared. On day 23 from receiving vaccine, her serum levels of thyroid hormones returned to normal, her —ft3 was 3.27 ng/dL and ft4 was 1.23 ng/dL. A thyroidectomy was recommended. However, she refused the surgical treatment option and preferred to be maintained by medication. On day 28 from receiving first dose of vaccine, she was discharged. In view of her underlying condition, such as diabetes mellitus and obesity, she was at high risk of developing severe COVID-19 pneumonia.

Therefore, on day 71 from receiving first dose of vaccine the woman received her second dose. She developed a fever of 37.8°C and pain at injection site after the second vaccination. These adverse events were improved spontaneously without any medication. No other serious complications were developed, moreover no signs of exacerbation of hyperthyroidism were noted. She reported at TSH <0.08 mIU/mL, ft3 1.9 ng/mL and ft4 of 0.73 on day 80 post first vaccination and on day 114 post vaccination she had a TSH <1.029 mIU/mL, ft3 1.9 ng/mL and ft4 of 0.59. As of August 20 or day 115 from receiving first dose of vaccine, she was in good condition except for mild oedema in both lower extremities and oedema. Currently, she was receiving thiamazole, edoxaban [edoxaban tosilate hydrate] and furosemide. Since day 101 from receiving first dose of vaccine, she was also receiving levothyroxine sodium [levothyroxine sodium hydrate] due to hypothyroidism. A catheter ablation was planned for persistent atrial fibrillation. It was hypothesised that she had received regular examination in outpatient for the treatment of obesity and diabetes until she had received first dose of tozinameran however no signs of hyperthyroidism were observed. But, US scan performed after receiving vaccine revealed a goiter lesion in the thyroid which suggests that she had subclinical thyroid disease which exacerbated after tozinameran. Hence development of subclinical exacerbation of hyperthyroidism was attributed to tozinameran.