Case Report

Herpes zoster-like eruption in a patient with poorly controlled Graves' disease: A case report in a resource-limited setting

Fajar M. Raharjo[1]*, Rulli Rosandi[2], Ali Anvarian[3] and Tetiana Potapova[4]

[1]Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia; [2]Department of Internal Medicine, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia; [3]Department of Biology, Faculty of Basic Science, University of Maragheh, Maragheh, Iran; [4]Department of Medical Sciences, Dnipropetrovsk State Medical Academy, Dnipro, Ukraine

*Corresponding author: fajarmaulana1993@gmail.com

Abstract

Varicella-zoster virus (VZV) reactivation has been associated with impaired cell-mediated immunity and several systemic conditions; however, its relationship with thyroid hormone dysregulation remains poorly understood. This case report describes a herpes zoster-like eruption occurring in a patient with inadequately controlled Graves' disease and discusses the possible biological mechanisms underlying this temporal association. A 33-year-old woman presented with unilateral erythematous, erosive, and crusted lesions involving the right maxillary division of the trigeminal nerve after developing clustered vesicles six days earlier. The patient had a one-year history of Graves' disease and had discontinued antithyroid therapy two months before presentation. Physical examination revealed proptosis and diffuse bilateral goiter, while thyroid function testing demonstrated an elevated free thyroxine level of 2.13 ng/dL and a suppressed thyroid-stimulating hormone level of <0.01 μIU/mL. A Tzanck smear showed multinucleated giant cells, supporting an alpha-herpesvirus infection, although VZV polymerase chain reaction testing was unavailable. Thyroid-stimulating hormone receptor antibody testing was also unavailable; therefore, Graves' disease was diagnosed clinically based on the characteristic findings of hyperthyroidism, diffuse goiter, and proptosis. The patient was treated with acyclovir, thiamazole, propranolol, intravenous saline, and local wound care. Progressive clinical improvement was observed, characterized by reduced erythema, crust formation, and subsequent post-inflammatory hyperpigmentation. This case highlights a temporal association between poorly controlled Graves' disease and a herpes zoster-like eruption. Nevertheless, the absence of virological confirmation and the inherent limitations of a single case preclude causal inference. The proposed involvement of thyroid hormone-mediated epigenetic and immune mechanisms should therefore be regarded as hypothesis-generating and requires validation in experimental and controlled clinical studies.

Keywords: Herpes zoster-like eruption, Graves' disease, hyperthyroidism, thyroid hormones, varicella-zoster virus

Copyright: © 2026 by the authors. This is an open access article distributed under the terms and conditions of the CC BY-NC 4.0.

Introduction

Reactivation of varicella-zoster virus (VZV), clinically manifested as herpes zoster, remains an important global health concern because of its acute morbidity and potential long-term complications, particularly postherpetic neuralgia [1]. Global estimates indicated approximately 83 million incident VZV-related cases between 1990 and 2019, with nearly 14,000 deaths annually and an incidence of 1,269 cases per 100,000 population in Asia [2,3]. VZV reactivation

Received: June 2, 2026 - Accepted: July 21, 2026 - Published online: July 31, 2026

has been associated with advanced age, immunosuppression, psychological stress, and endocrine disorders, although much of the available evidence is observational [4,5]. Thyroid dysfunction has emerged as a potential factor associated with alpha-human herpesvirus reactivation, particularly among patients with autoimmune thyroid disorders [6]. Experimental studies suggest that thyroid hormones may regulate herpesvirus gene expression and replication in neuronal cells through nuclear receptor-mediated chromatin modifications at viral promoters [7]. However, whether dysregulated thyroid hormone signaling contributes to VZV reactivation in humans remains uncertain [8].

Graves' disease is an autoimmune thyroid disorder characterized by hyperthyroidism, diffuse goiter, and ophthalmopathy, primarily resulting from autoantibodies directed against the thyroid-stimulating hormone receptor [9,10]. Poorly controlled Graves' disease has been hypothesized to facilitate latent herpesvirus reactivation through thyroid hormone-mediated epigenetic dysregulation, hypermetabolic alterations, or impaired cellular immune responses. Nevertheless, the proposed epigenetic mechanisms have primarily been demonstrated in in vitro models of herpes simplex virus (HSV) type 1 rather than VZV, and their applicability to human VZV latency and reactivation has not been established [11,12]. Retrospective and observational studies have reported associations between thyroid hormone abnormalities and alpha-human herpesvirus detection, particularly among adult females [13-16]. These findings, however, do not establish causality and may be influenced by residual confounding.

Clinical evidence specifically linking inadequately controlled Graves' disease with VZV reactivation remains limited. The molecular interaction between thyroid hormone response elements and the VZV genome has not been fully characterized in humans, and no established approach is available for identifying patients with Graves' disease who may be at increased risk of herpes zoster [17,18]. Diagnostic uncertainty may be particularly relevant in resource-limited settings where confirmatory virological and immunological tests are not readily available. Therefore, carefully documented clinical observations may contribute to hypothesis generation and improve recognition of this uncommon clinical presentation, although they cannot establish a causal relationship.

This case report describes the clinical presentation, diagnostic evaluation, management, and clinical course of a 33-year-old patient with inadequately controlled Graves' disease who developed a herpes zoster-like eruption involving the maxillary division of the trigeminal nerve. The report also discusses the potential pathophysiological mechanisms underlying this temporal association while acknowledging the absence of definitive virological confirmation and the limited evidence supporting causality.

Case

A 33-year-old female patient presented with erythema of the right cheek that had persisted for two days before hospital admission. Six days before admission, the patient had developed multiple fluid-filled vesicles that progressively increased in number and subsequently ruptured spontaneously, leaving erythematous erosions covered by dark-brown crusts. The vesicular eruption was accompanied by fever, which improved following antipyretic administration. The patient had been diagnosed with Graves' disease one year earlier after presenting with palpitations, anterior neck enlargement, and weight loss. Antithyroid treatment had been discontinued two months before admission because the patient perceived an improvement in symptoms. The previous treatment regimen consisted of thiamazole 20 mg once daily and propranolol 40 mg three times daily. Propylthiouracil had previously been prescribed but was discontinued because of nausea and vomiting. The patient also reported a history of varicella infection during childhood.

On admission, the patient appeared moderately unwell and had a body mass index of 22.0 kg/m^2. Head and neck examination revealed proptosis and unilateral cutaneous lesions over the right cheek corresponding to the maxillary division of the trigeminal nerve. The lesions consisted of multiple, variably sized, well-demarcated erosions with erythematous bases, some of which were partially covered by brown crusts (**Figure 1A**). Neck examination demonstrated bilateral diffuse thyroid enlargement that was firm, smooth, well-demarcated, non-tender, and mobile on swallowing, without an audible bruit (**Figure 1B**).

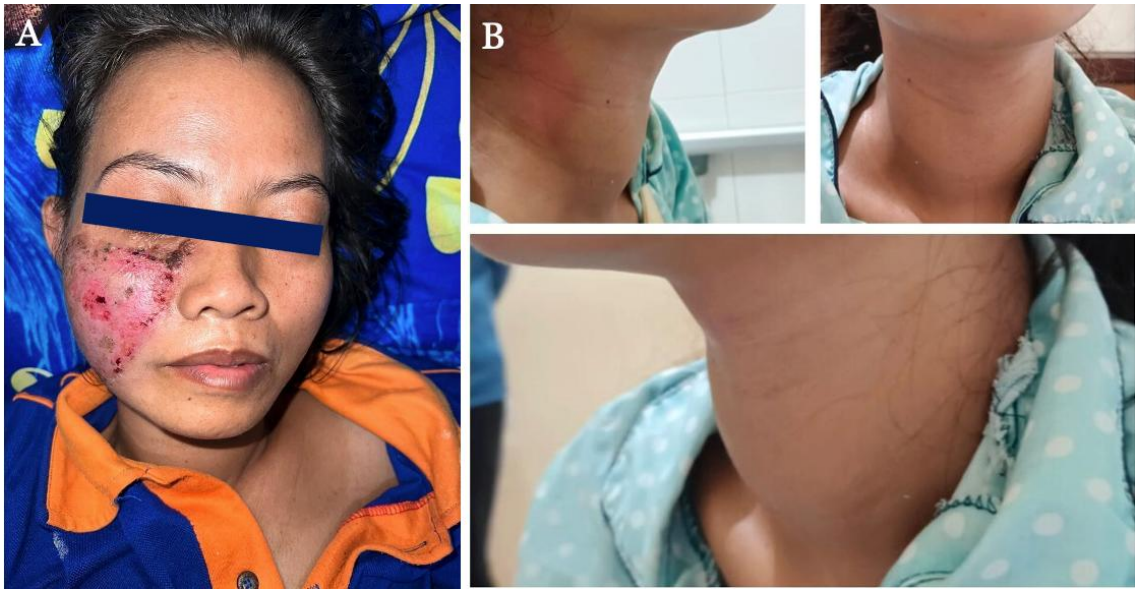

Figure 1. Clinical manifestations of a herpes zoster-like eruption and thyroid enlargement: (A) unilateral erosive and crusted lesions over the right cheek, distributed along the maxillary division of the trigeminal nerve (V2), consistent with a herpes zoster-like eruption; (B) bilateral diffuse enlargement of the thyroid gland in a patient with clinically diagnosed Graves' disease.

Laboratory investigations showed an elevated free thyroxine (FT4) level of 2.13 ng/dL (reference range: 0.93–1.70 ng/dL) and a suppressed thyroid-stimulating hormone (TSH) level of <0.01 µIU/mL (reference range: 0.27–4.20 µIU/mL), consistent with uncontrolled hyperthyroidism. Thyroid-stimulating hormone receptor antibody (TSHRAb) testing was unavailable at the hospital. Complete blood count, liver and kidney function parameters, electrolyte levels, and random blood glucose were within normal limits. Gram staining of the sample obtained from the lesions demonstrated polymorphonuclear leukocytes without detectable microorganisms (**Figure 2A**), whereas Tzanck smear examination revealed multinucleated giant cells (**Figure 2B**). These cytological findings supported an alpha-herpesvirus infection but could not differentiate VZV from HSV. VZV polymerase chain reaction (PCR) testing was not performed because of limited diagnostic resources; therefore, definitive virological confirmation was not obtained. Based on the unilateral dermatomal distribution of the lesions involving the maxillary division of the trigeminal nerve, the presentation was considered a herpes zoster-like eruption. Graves' disease was regarded as the most likely underlying thyroid disorder based on the presence of hyperthyroidism, diffuse goiter, and proptosis, together with the elevated FT4 and suppressed TSH levels, despite the absence of TSHRAb confirmation.

The patient received a diet providing 1,900 kcal/day, intravenous 0.9% sodium chloride solution at 1,500 mL/day, thiamazole 20 mg once daily, propranolol 20 mg twice daily, and acyclovir 800 mg five times daily. Continuous moist wound care was provided, and the patient was referred to the dermatovenereology service for further evaluation and management. During hospitalization, progressive clinical improvement was observed, characterised by reduced erythema and crusting. At the final follow-up visit, the lesions had resolved with residual post-inflammatory hyperpigmentation over the right cheek. The patient was advised to continue antithyroid therapy and undergo thyroid function testing every 4–6 weeks to assess treatment response and maintain adequate control of Graves' disease.

Discussion

This case describes a 33-year-old patient with clinically diagnosed, poorly controlled Graves' disease who developed a unilateral herpes zoster-like eruption involving the maxillary division of the trigeminal nerve. Graves' disease was considered the most likely underlying thyroid disorder based on the presence of hyperthyroidism, diffuse goitre, and proptosis, together with an elevated free thyroxine level and suppressed thyroid-stimulating hormone level. The dermatomal distribution of the lesions and the presence of multinucleated giant cells on Tzanck smear

supported an alpha-human herpesvirus infection. However, thyroid-stimulating hormone receptor antibody testing and VZV PCR testing were unavailable. Because Tzanck cytology cannot differentiate VZV from HSV, the presentation was classified as a herpes zoster-like eruption rather than virologically confirmed herpes zoster. This diagnostic uncertainty reflects an important challenge in resource-limited settings and should be considered when interpreting the clinical findings.

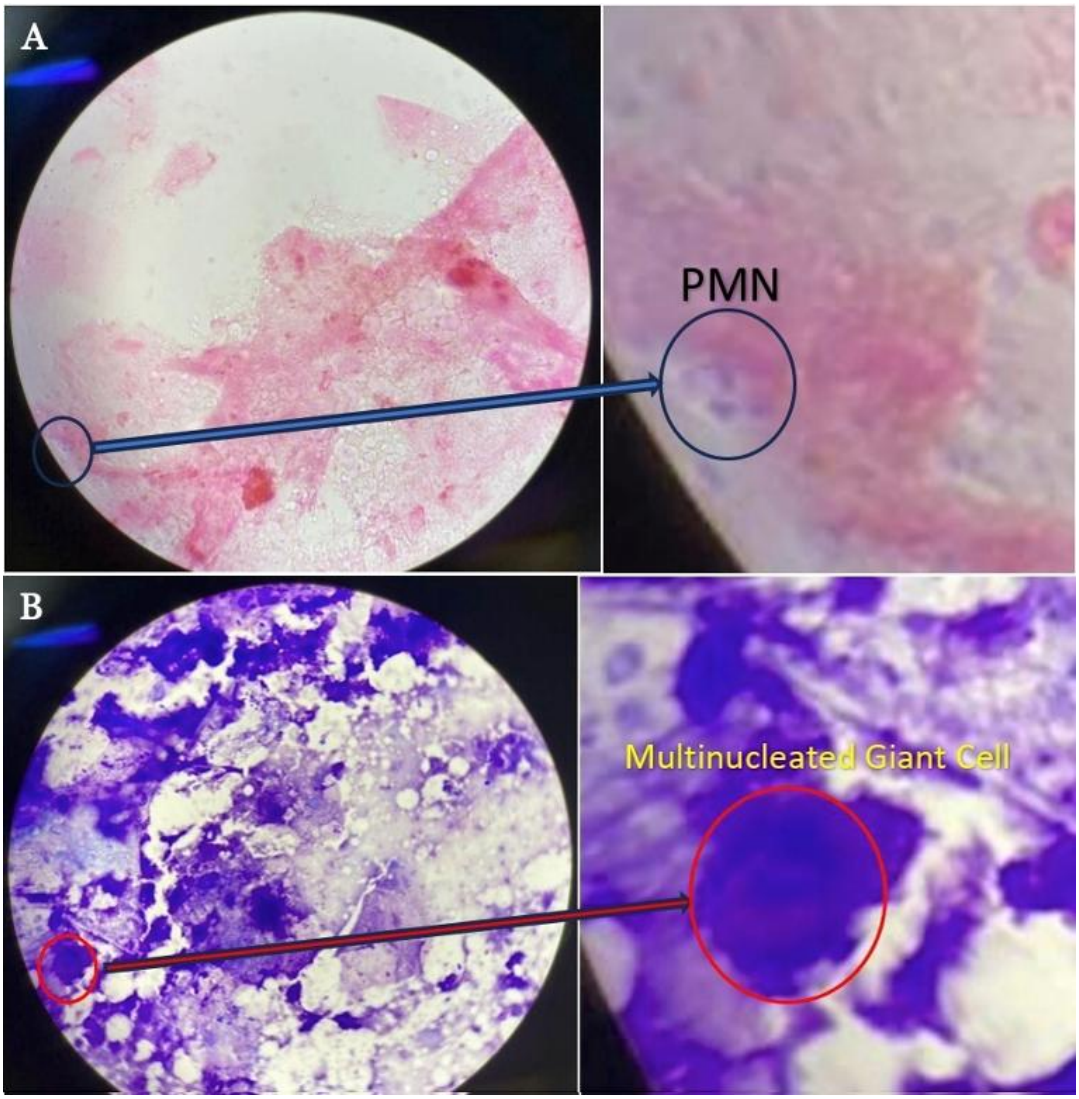

Figure 2. Cytological findings from the herpes zoster-like eruption: (A) gram-stained specimen showing polymorphonuclear leukocytes without detectable microorganisms; (B) Tzanck smear demonstrating multinucleated giant cells, a cytological finding suggestive of alpha-herpesvirus infection but not specific for differentiating varicella-zoster virus (VZV) from herpes simplex virus (HSV).

The development of the eruption after a two-month interruption of antithyroid therapy suggests a temporal relationship between inadequately controlled thyroid dysfunction and alpha-human herpesvirus reactivation. Studies reported higher odds of alpha-human herpesvirus detection among patients with thyroid hormone disorders than among euthyroid controls, particularly among adult females, with an adjusted odds ratio of up to 3.0 [13,15]. Nevertheless, observational associations do not establish causality and may be affected by residual confounding. In the present case, the eruption may have been influenced by unmeasured factors such as psychological stress, nutritional conditions, environmental exposures, or undetected alterations in immune function. Accordingly, the coexistence of uncontrolled Graves' disease and the herpes zoster-like eruption should be interpreted as hypothesis-generating rather than evidence of a direct causal relationship.

Some biological mechanisms have been proposed to explain a possible relationship between thyroid hormone dysregulation and herpesvirus reactivation. Experimental studies have shown that thyroid hormones may suppress HSV-1 gene expression and replication in differentiated neuronal cells through nuclear receptor-mediated chromatin modification at viral promoters [14,19]. Dysregulated thyroid hormone signalling could therefore theoretically interfere with the epigenetic mechanisms that maintain viral latency. A thyroid hormone response element-like sequence has also been proposed within the VZV genome [11,20]. However, these mechanisms have predominantly been investigated in in vitro HSV-1 models and have not been validated for VZV latency or reactivation in human sensory ganglia. Extrapolation of these experimental findings to the present clinical observation must therefore be undertaken cautiously. Uncontrolled hyperthyroidism may also influence viral latency through metabolic and immunological pathways. Excess thyroid hormone may produce a hypermetabolic state and alter the cellular or tissue microenvironment [21,22]. In addition, impairment of T-lymphocyte-mediated immune surveillance could theoretically reduce control of latent herpesviruses [23]. These mechanisms are biologically plausible but could not be assessed in the present case because T-lymphocyte subsets, natural killer cells, cytokines, and other markers of cellular immunity were not evaluated. Furthermore, treatment non-adherence was self-reported and was not verified using pharmacy records, pill counts, or other objective measures. The precise duration and severity of thyroid hormone dysregulation before the eruption therefore remain uncertain.

The involvement of the maxillary division of the trigeminal nerve is consistent with the neurotropic properties of alpha-human herpesviruses. Both VZV and HSV-1 establish latency in sensory neurons, including those of the trigeminal ganglion, and may subsequently reactivate along the corresponding dermatomal distribution [24-26]. In vitro studies have indicated that triiodothyronine can suppress HSV-1 promoter activity and promote repressive chromatin modifications in differentiated neuronal cells [11,27]. Nevertheless, these findings have not been reproduced in VZV models or confirmed in vivo in humans. Consequently, the hypothesis that thyroid hormone dysregulation disrupted viral suppression within the trigeminal ganglion remains speculative [11,28]. Alternative mechanisms involving hypermetabolism and altered cellular immunity also require direct experimental validation [29,30].

The patient experienced progressive clinical improvement following treatment with acyclovir, reinitiation of antithyroid therapy, propranolol, supportive therapy, and local wound care. However, improvement after concurrent antiviral and endocrine treatment cannot determine the independent contribution of thyroid control to the clinical outcome. Antiviral treatment remains appropriate for a clinically suspected herpes zoster-like eruption, while adequate treatment of Graves' disease is necessary to prevent established endocrine complications. Whether thyroid control reduces the risk of subsequent VZV reactivation remains unknown and cannot be inferred from this case.

This case has some clinical implications. Clinicians should consider an alpha-human herpesvirus infection when patients with autoimmune thyroid disease present with unilateral vesicular, erosive, or crusted lesions following a dermatomal distribution, including in younger adults. In resource-limited settings, clinical examination and Tzanck cytology may support the diagnosis when molecular testing is unavailable, although their diagnostic limitations must be acknowledged. The case also reinforces the importance of patient education and sustained adherence to antithyroid therapy. However, the available evidence is insufficient to recommend routine thyroid function screening for all patients with herpes zoster or to conclude that antithyroid treatment prevents herpesvirus reactivation. Targeted thyroid evaluation may instead be considered when compatible symptoms, recurrent episodes, or other clinical indications are present.

Some limitations should be acknowledged in this case. The single-patient design precludes causal inference and limits the generalisability of the findings. Potential confounding factors, including psychological stress, nutritional status, environmental exposures, and unrecognised immune abnormalities, were not comprehensively assessed. In addition, VZV PCR and thyroid-stimulating hormone receptor antibody testing were unavailable, preventing definitive confirmation of both the viral aetiology and autoimmune thyroid diagnosis. Relevant immunological parameters, including T-lymphocyte subsets, natural killer cells, and cytokines,

were also not measured. Future studies should incorporate VZV-specific molecular testing, thyroid autoantibody measurement, longitudinal follow-up, and detailed immunological profiling to clarify whether thyroid hormone dysregulation contributes to alpha-human herpesvirus reactivation.

Conclusion

This case describes a 33-year-old patient with poorly controlled Graves' disease who developed a herpes zoster-like eruption involving the maxillary division of the trigeminal nerve. The diagnosis was supported by the characteristic dermatomal distribution, elevated free thyroxine level, suppressed thyroid-stimulating hormone level, and multinucleated giant cells on Tzanck smear. However, the absence of VZV PCR testing precluded definitive virological confirmation. The temporal coexistence of uncontrolled hyperthyroidism and the cutaneous eruption may suggest a potential relationship, but causality cannot be inferred from a single case. Proposed mechanisms involving thyroid hormone-mediated epigenetic regulation or altered cellular immunity remain hypothetical and are largely extrapolated from in vitro studies of HSV-1. Further experimental and clinical studies are required to clarify whether thyroid hormone dysregulation contributes to VZV reactivation.

Ethics approval

Written informed consent was obtained from the patient for participation and publication of the clinical information and accompanying images.

Acknowledgments

None.

Competing interests

The authors declare that there are no conflicts of interest.

Funding

This study received no external funding.

Underlying data

All data supporting the findings of this case report are presented within the article.

Declaration of artificial intelligence use

Artificial intelligence (AI) tool, ChatGPT, was used for language refinement, including improvement of grammar, sentence structure, and readability. Authors confirm that all AI-assisted processes were critically reviewed by the authors to ensure the integrity and reliability of the results. The final decisions and interpretations presented in this article were made solely by the authors.

How to cite

Raharjo FM, Rosandi R, Anvarian A, Potapova T. Herpes zoster-like eruption in a patient with poorly controlled Graves' disease: A case report in a resource-limited setting. Narra Intern Med 2026; 1 (2): e13 - http://doi.org/10.52225/narraim.v1i2.13.

References

1. Gershon AA, Breuer J, Cohen JI, *et al.* Varicella zoster virus infection. Nat Rev Dis Primers 2015;1:15016.
2. Wu Z, Zhang J, Wei J, *et al.* Global burden of varicella and herpes zoster across 204 countries, 1990-2021: A temporal trend analysis in the era of the COVID-19 pandemic and projections to 2036. Front Public Health 2025;13:1654535.
3. Chan XV, Tan NC, Ng MCW, *et al.* Prevalence and healthcare utilization in managing herpes zoster in primary care: A retrospective study in an Asian urban population. Front Public Health 2023;11:1213736.

4. Oleszko M, Zapolnik P, Kmiecik W, Czajka H. Herpes zoster: Risk factors for occurrence, complications, and recurrence with a focus on immunocompromised patients. Diseases 2025;13(3):71.
5. Sabisi MA, Al-Shammari ZA. Major non-communicable diseases in Asia: Burden, epidemiological trends and projections, and future challenges. Narra Intern Med 2026;1(1):e7.
6. Kyritsi EM, Kanaka-Gantenbein C. Autoimmune thyroid disease in specific genetic syndromes in childhood and adolescence. Front Endocrinol (Lausanne) 2020;11:543.
7. Chen F, Palem J, Balish M, *et al.* A novel thyroid hormone mediated regulation of HSV-1 gene expression and replication is specific to neuronal cells and associated with disruption of chromatin condensation. SOJ Pharm Pharm Sci 2014;1(1):06.
8. Lai SW, Kuo YH, Liao KF. Investigating the association between hyperthyroidism and the risk of herpes zoster in a cohort study in Taiwan. Biomedicine (Taipei) 2025;15(3):36-43.
9. Committee on Pharmaceutical Affairs, Japanese Society for Pediatric Endocrinology, and the Pediatric Thyroid Disease Committee, Japan Thyroid Association (Taskforce for the Revision of the Guidelines for the Treatment of Childhood-Onset Graves' Disease); Minamitani K, Sato H, *et al.* Guidelines for the treatment of childhood-onset Graves' disease in Japan, 2016. Clin Pediatr Endocrinol 2017;26(2):29-62.
10. Ushakov AV. Minor hyperthyroidism with normal levels of thyroid-stimulating hormone receptor antibodies: A case report. J Med Life 2024;17(2):236-238.
11. Figliozzi RW, Chen F, Balish M, *et al.* Thyroid hormone-dependent epigenetic suppression of herpes simplex virus-1 gene expression and viral replication in differentiated neuroendocrine cells. J Neurol Sci 2014;346(1-2):164-173.
12. von Renesse J, von Kessel MKF, Oehme F, *et al.* Indirect calorimetry identifies hypermetabolism associated with muscle wasting and increased risk of energy deficit in ICU patients. Crit Care 2025;29(1):464.
13. Hsia SH, Hsia SV. A cohort historical analysis of the relationship between thyroid hormone malady and alpha-human herpesvirus activation. J Steroids Horm Sci 2014;5(2):133.
14. Figliozzi RW, Chen F, Hsia SV. New insights on thyroid hormone mediated regulation of herpesvirus infections. Cell Biosci 2017;7:13.
15. Li Y, Li W. Viral infection and thyroid disorders: A narrative review. Front Microbiol 2025;16:1625179.
16. Muñoz-Ortiz J, Sierra-Cote MC, Zapata-Bravo E, *et al.* Prevalence of hyperthyroidism, hypothyroidism, and euthyroidism in thyroid eye disease: A systematic review of the literature. Syst Rev 2020;9(1):201.
17. Desailloud R, Hober D. Viruses and thyroiditis: An update. Virol J 2009;6:5.
18. Sanjuán R, Domingo-Calap P. Mechanisms of viral mutation. Cell Mol Life Sci 2016;73(23):4433-4448.
19. Chen F, Figliozzi RW, Bedadala G, *et al.* Overexpression of thyroid hormone receptor beta1 altered thyroid hormone-mediated regulation of herpes simplex virus-1 replication in differentiated cells. J Neurovirol 2016;22(5):555-563.
20. Kennedy PGE, Mogensen TH, Cohrs RJ. Recent issues in varicella-zoster virus latency. Viruses 2021;13(10):2018.
21. Iascone DM, Zhang X, Brafford P, *et al.* Hypermetabolic state is associated with circadian rhythm disruption in mouse and human cancer cells. Proc Natl Acad Sci U S A 2024;121(30):e2319782121.
22. Sachs PC, Mollica PA, Bruno RD. Tissue specific microenvironments: A key tool for tissue engineering and regenerative medicine. J Biol Eng 2017;11:34.
23. Walton S, Mandaric S, Oxenius A. CD4 T cell responses in latent and chronic viral infections. Front Immunol 2013;4:105.
24. Campbell TM, McSharry BP, Steain M, *et al.* Varicella-zoster virus and herpes simplex virus 1 differentially modulate NKG2D ligand expression during productive infection. J Virol 2015;89(15):7932-7943.
25. Kennedy PGE, Rovnak J, Badani H, Cohrs RJ. A comparison of herpes simplex virus type 1 and varicella-zoster virus latency and reactivation. J Gen Virol 2015;96(Pt 7):1581-1602.
26. Flowerdew SE, Wick D, Himmelein S, *et al.* Characterization of neuronal populations in the human trigeminal ganglion and their association with latent herpes simplex virus-1 infection. PLoS One 2013;8(12):e83603.
27. Hsia SC, Bedadala GR, Balish MD. Effects of thyroid hormone on HSV-1 gene regulation: Implications in the control of viral latency and reactivation. Cell Biosci 2011;1:24.
28. Hsia SV, Chen LH, Tseng HF. Receipt of thyroid hormone deficiency treatment and risk of herpes zoster. Int J Infect Dis 2017;59:90-95.
29. Sabatino L, Vassalle C. Thyroid hormones and metabolism regulation: Which role on brown adipose tissue and browning process? Biomolecules 2025;15(3):361.
30. Nian Y, Minami K, Maenesono R, *et al.* Changes of T-cell immunity over a lifetime. Transplantation 2019;103(11):2227-2233.