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Case Report

Graves Disease Presenting Psychosis: a Case Report

Devina Sagitania [1], Agung Frijanto[2], Budi Yuwono[3]

[1]Soeharto Heerdjan Mental Hospital, Jakarta, Indonesia
[2]Psychiatric Department, Soeharto Heerdjan Mental Hospital, Jakarta, Indonesia
[3]Internal Medicine Department, Soeharto Heerdjan Mental Hospital, Jakarta, Indonesia

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Correspondence Author:
Email: dsagitania17@gmail.com

Abstract

Introductions: Graves' disease is the most common cause of hyperthyroidism. Neuropsychiatric manifestations may occur in thyroid disease. As the premier clinical manifestation of Graves disease, psychosis is highly uncommon; it was reported in 1% of cases. The major neuropsychiatric manifestations of hyperthyroidism are acute psychosis, dementia, apathy, agitation, mania, delusional behavior, and hallucinations, especially in older people. Psychosis is highly rare as the first clinical symptom of a grave disease. **Case:** A 48-year-old female with grave disease symptoms had been taken to the emergency department with psychotic manifestations. She had a three-month history of increasing irritability, increasing irrational talking, staying awake most of the night, muttering, nighttime wandering, and poor personal hygiene. She was admitted to the hospital, and the laboratory investigations showed an elevated FT4 and a decreased thyroid-stimulating hormone (TSH). The patient was started on propanolol 3 x 10 mg, propylthiouracil 3 x 50 mg tab, risperidone 2x2mg, trihexylphenidil 2x2mg, lorazepam 1x2mg, and Zyprexa injection once, which showed improvement in psychotic symptoms. **Conclusion:** Graves' disease can present with neuropsychiatric manifestations such as psychosis, mania, or a combination of both. A detailed medical history and physical and psychiatric evaluation are necessary for diagnosing and giving adequate treatment. A detailed clinical evaluation, including thyroid function tests, could be recommended for all patients who showed psychotic symptoms. More research is needed to comprehend the pathophysiology underlying psychosis due to Graves' disease, so that it is expected that the management can be carried out properly.

Keywords: Psychosis, Schizophrenia, Graves Disease, Hyperthyroidism, Mental Health

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Introductions

Graves' disease is the most general cause of hyperthyroidism [1]. Clinical evaluation, laboratory tests, including serum levels of triiodothyronine (T3) and thyroxine (T4), the main hormones produced by the thyroid gland, and thyroid autoantibodies, and imaging studies can confirm the diagnosis of Graves disease [2]. Neuropsychiatric manifestations may occur in thyroid disease. The most common implied symptoms are anxiety, depression, tremors, irritability, palpitations, insomnia, heat intolerance, weight loss, lack of concentration, loss of memory, menstrual irregularity, and fatigue [3, 4]. Hyperthyroidism might cause apathy, agitation, mania, and psychosis, particularly in older people; conversely, dysphoria, depression, and a progressive decline in cognitive function might show in hypothyroidism. As the premier clinical manifestation of Graves disease, psychosis is highly uncommon; it was reported in 1% of cases [5, 6]. The specific mechanism behind the development of psychosis in grave disease is still being researched, although biological-psychosocial factors are considered to be involved in the etiology [7]. Thyroid hormones could interact with neurotransmitters such as serotonin and modulate the beta-adrenergic response to catecholamines in the central nervous system, which might affect the psychosis manifestations [8]. Several studies have demonstrated improvement in mental symptoms after the normalization of thyroid function, although it has also been shown that mental symptoms persist in many patients after the normalization of thyroid function [6].

Due to the fact that grave disease can be associated with psychotic symptoms, a detailed medical history and physical, clinical, and psychiatric evaluation are necessary for diagnosing and giving adequate treatment in these cases and estimating the disease's severity. Collaboration between specialists is needed to analyze the symptoms' cause and establish an adequate treatment. Herein, we explain the case of a 48-year-old female with Graves' disease who showed psychotic symptoms.

Case

A 48-year-old female had been taken to the emergency department (ED) by her husband with a three-month history of increasing irritability, increasing irrational talking, staying awake most of the night, muttering, night-time wandering, and inadequate personal hygiene. It was reported that she became unfriendly and verbally abusive, which resulted in her withdrawal from society. The patient's condition was getting worse.

It was reported that she was screaming constantly, especially when she saw her husband. She insulted and blamed her husband. Her family believed that she was under the control of demonic spirits as a result of this development, so they took her to a psychic for an "exorcism." She was never diagnosed with mental disorders in the past and didn't have any history of psychoactive substance abuse.

The patient's husband noticed that her enlargement in the neck area has been getting bigger since two years ago. She was reported to have menopause at 45 years old, weight loss, and hair loss at around 2 months. The patient didn't undergo a medical evaluation or take any medications or supplements.

A mental state examination showed restlessness, uncooperation, and irritability. Besides, the speech was incoherent, verbally abusive, had persecutory delusions, and had logorrhea. At the time of admission, the vital signs were significant for a blood pressure of 102/63 mmHg, a heart rate of 105 beats per minute, and a temperature of 36.7 oC. Physical examination found a soft, smooth, well-defined, and non-tender goiter, warm, moist palms, alopecia, and bilateral exophthalmos.

Laboratory results showed a thyroid-stimulating hormone (TSH) level of 0.13 µIU/mL (reference range: 0.27–4.20 µIU/mL) and a free T4 level of >7.77 ng/

dL (reference range: 0.93–1.70 ng/dL). Neck ultrasonography revealed a diffuse goiter (right: 2.3 x 2.9 cm, left: 2.1 x 28 cm), a hypervascular impression, no nodules, and no enlarged lymph gland. Electrocardiography (ECG) presented sinus tachycardia.

A provisional diagnosis of schizophrenia, schizoaffective as a differential diagnosis, and secondary to Graves' disease [9]. She was admitted to the hospital, and the patient was started on propanolol 3x10 mg, propylthiouracil 3x50 mg tab, risperidone 2x2mg, trihexylphenidil 2x2mg, and lorazepam 1x2mg. Additionally, a Zyprexa injection was given once. The patient indicated an enhancement in psychotic symptoms within two weeks of therapy. She was discharged and had to do some follow-ups at internist and psychiatric outpatient clinics.

Discussions

Graves' disease is defined as an autoimmune disorder of the thyroid gland, with a diffuse goiter and circulating thyroid auto-antibodies in the blood as the most common characteristics and cause of hyperthyroidism [10]. Thyroid disease has been reported as relating to a mental disorder such as mania, depression, anxiety, and psychosis [4]. However, the psychosis manifestation associated with hyperthyroidism is an unusual case [3, 6]. Even though when psychosis could have a primary disease, hyperthyroidism by itself could be associated with psychiatric manifestations. The major neuropsychiatric manifestations of hyperthyroidism are acute psychosis, dementia, apathy, agitation, mania, delusional behavior, and hallucination, especially in older people [2, 11, 12]. Only 1% of patients with graves disease showed psychosis symptoms, and the majority of patients have been previously diagnosed with one or more mental disorders [5, 6].

In this case, manifestations of graves disease worsen over time, and the psychiatric symptoms occur after the graves disease occurs. The psychosis symptoms in this patient are increasingly irrational talking, incoherence, increasing irritability, muttering, nighttime wandering, inadequate personal hygiene, and insomnia.

According to the literature, Von Basedow described the first case-patient with grave disease who showed manic psychosis symptoms [13]. Iskandar et al, described that catatonia, insomnia, and paranoia might be caused by untreated hyperthyroidism [14]. Lu et al. explained the case of a 14-year-old who had been diagnosed with a thyroid storm after affliction. An episode of seizure on the second day of hospitalization showed strange behavior, and it was resolved after using standard antithyroid treatment [15]. Lo et al. reported that hyperthyroidism caused 4 of 22 patients with organic delusional disorders to have psychosis [16]. Misiak et al. described that the levels of TSH might be decreased in persons with first-episode psychosis [17]. A detailed clinical evaluation, including thyroid function tests, should be recommended for all patients who show psychotic symptoms.

The fundamental specific mechanism of the psychosis development in grave disease is still being studied. Thyroid hormone receptors are localized in the limbic system (amygdala and hippocampus) and influence a variety of functions, including mood, long-term memory, behavior, and cognition [8]. Neuropsychiatric symptoms in hyperthyroidism might be caused by the excess of thyroid hormones that influence the activities of neurotransmitters such as dopamine and serotonin in the limbic system (amygdala and hippocampus). Psychotic behaviors in hyperthyroidism patients also might be caused by the thyroid hormone that modulates the beta-adrenergic response to catecholamines in the central nervous system [8, 10, 18].

Management of the patient with hyperthyroidism showing psychosis or mania may require anti-thyroid medication and non-selective beta-blockers such as propranolol [19]. A non-selective beta-adrenoceptor antagonist, propranolol, could penetrate

the blood-brain barrier and take action as a central beta-adrenoceptor antagonist, which makes propranolol an adequate treatment for mania [7, 8, 20]. In this case, the psychosis symptoms were managed with antipsychotics and benzodiazepine. Hyperthyroidism was managed with propranolol and propylthiouracil. Since graves disease can be associated with psychotic symptoms, a detailed medical history and physical and psychiatric evaluation are necessary for diagnosing, giving adequate treatment in these cases, and assessing the disease's severity. Collaboration between specialists is required to analyze the symptoms' cause and establish an accurate treatment as soon as possible.

Conclusions

Graves' disease can present with neuropsychiatric manifestations such as psychosis, mania, or a combination of both. A detailed medical history and physical and psychiatric evaluation are necessary for diagnosing and giving adequate treatment. A detailed clinical evaluation, including thyroid function tests, could be recommended for all patients who showed psychotic symptoms. Treatment for hyperthyroidism requires anti-thyroid medications and beta-blockers. Treatment for psychotic symptoms requires antipsychotics and benzodiazepines. This case showed improvement in psychosis symptoms associated with Graves disease. Our case serves as a reminder that antipsychotic medications in combination with adequate treatment of underlying hyperthyroidism can effectively treat psychosis symptoms. A poor response should give attention to an alternative diagnosis. More research is needed to comprehend the basic pathophysiology of psychosis due to Graves' disease, so that it is expected that the management can be carried out properly.

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Conflict of Interest

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References

[1] B. Pokhrel and K. Bhusal, Graves Disease. Treasure Island (FL): StatPearls Publishing, 2022. Accessed: Mar. 05, 2024. [Online]. Available: https://pubmed.ncbi.nlm.nih.gov/28846288/

[2] D. Desai, S. Zahedpour Anaraki, N. Reddy, E. Epstein, and V. Tabatabaie, "Thyroid Storm Presenting as Psychosis," J. Investig. Med. High Impact Case Reports, vol. 6, p. 232470961877701, Jan. 2018, doi: 10.1177/2324709618777014.

[3] L. Urias-Uribe, E. Valdez-Solis, C. González-Milán, C. Ramírez-Rentería, and A. Ferreira-Hermosillo, "Psychosis Crisis Associated with Thyrotoxicosis due to Graves' Disease," Case Rep. Psychiatry, vol. 2017, pp. 1–4, 2017, doi: 10.1155/2017/6803682.

[4] H. Asif, I. Nwachukwu, A. Khan, G. Rodriguez, and G. Bahtiyar, "Hyperthyroidism Presenting With Mania and Psychosis: A Case Report," Cureus, Feb. 2022, doi: 10.7759/cureus.22322.

[5] B. Brownlie, A. Rae, J. Walshe, and J. Wells, "Psychoses associated with thyrotoxicosis - 'thyrotoxic psychosis.' A report of 18 cases, with statistical analysis of incidence," Eur. J. Endocrinol., pp. 438–444, May 2000, doi: 10.1530/eje.0.1420438.

[6] A. Fukao et al., "Graves' disease and mental disorders," J. Clin. Transl. Endocrinol., vol. 19, p. 100207, Mar. 2020, doi: 10.1016/j.jcte.2019.100207.

[7] K. S. Kendler and C. O. Gardner, "Depressive vulnerability, stressful life events and episode onset of major depression: a longitudinal model," Psychol. Med., vol.

46, no. 9, pp. 1865–1874, Jul. 2016, doi: 10.1017/S0033291716000349.
[8] R. Bunevicius and A. J. Prange, "Psychiatric Manifestations of Graves??? Hyperthyroidism," CNS Drugs, vol. 20, no. 11, pp. 897–909, 2006, doi: 10.2165/00023210-200620110-00003.
[9] American Psychiatric Association, Diagnostic and statistical manual of mental disorders: DSM-5, 5th ed. Washington, D.C: American Psychiatric Association, 2013.
[10] E. T. Ugwu, J. Maluze, and G. C. Onyebueke, "Graves' Thyrotoxicosis Presenting as Schizophreniform Psychosis: A Case Report and Literature Review," Int. J. Endocrinol. Metab., vol. 15, no. 1, Dec. 2016, doi: 10.5812/ijem.41977.
[11] A. Z. Feldman, R. T. Shrestha, and J. V. Hennessey, "Neuropsychiatric Manifestations of Thyroid Disease," Endocrinol. Metab. Clin. North Am., vol. 42, no. 3, pp. 453–476, Sep. 2013, doi: 10.1016/j.ecl.2013.05.005.
[12] M. Jurado-Flores, F. Warda, and A. Mooradian, "Pathophysiology and Clinical Features of Neuropsychiatric Manifestations of Thyroid Disease," J. Endocr. Soc., vol. 6, no. 2, Feb. 2022, doi: 10.1210/jendso/bvab194.
[13] S. Greer and V. Parsons, "Schizophrenia-Like Psychosis in Thyroid Crisis," Br. J. Psychiatry, vol. 114, no. 516, pp. 1357–1362, Nov. 1968, doi: 10.1192/bjp.114.516.1357.
[14] M. Iskandar, E. Stepanova, and A. Francis, "Two Cases of Catatonia With Thyroid Dysfunction," Psychosomatics, vol. 55, no. 6, pp. 703–707, Nov. 2014, doi: 10.1016/j.psym.2014.01.001.
[15] Y.-Y. Lu, K.-W. Hu, and N.-P. Foo, "Psychotic appearances in a young girl: Thyroid storm," J. Acute Med., vol. 3, no. 1, pp. 14–16, Mar. 2013, doi: 10.1016/j.jacme.2012.10.002.
[16] Y. Lo, S. -J. Tsai, C. Chang, J. -P. Hwang, and C. -B. Sim, "Organic delusional disorder in psychiatric in-patients: comparison with delusional disorder," Acta Psychiatr. Scand., vol. 95, no. 2, pp. 161–163, Feb. 1997, doi: 10.1111/j.1600-0447.1997.tb00390.x.
[17] B. Misiak et al., "Thyroid hormones in persons with schizophrenia: A systematic review and meta-analysis," Prog. Neuro-Psychopharmacology Biol. Psychiatry, vol. 111, p. 110402, Dec. 2021, doi: 10.1016/j.pnpbp.2021.110402.
[18] K. I. Adediran, D. Alapati, and J. J. Rasimas, "Delusional Psychosis in Graves' Disease," Prim. Care Companion CNS Disord., vol. 20, no. 1, Jan. 2018, doi: 10.4088/PCC.17l02145.
[19] L. R. Macedo, J. Marino, B. Bradshaw, and J. Henry, "Graves' Hyperthyroidism-Induced Psychosis Treated With Aripiprazole—A Case Report," J. Pharm. Pract., vol. 26, no. 1, pp. 59–61, Feb. 2013, doi: 10.1177/0897190012451934.
[20] O. C. A. Williams, M. Abdulrahim, V. Davis, C. Jenson, A. Anand, and A. K. Bachu, "Management of Psychosis Associated with Graves' Disease: A Rare Case Report," Case Rep. Psychiatry, vol. 2022, pp. 1–4, Dec. 2022, doi: 10.1155/2022/4685870.