



# Myxedema Coma Patient in Emergency Department: A Case Report

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Hypothermic patients are rare encountered in emergency department (ED). It often represents critical condition that needs prompt management and diagnosis. Myxedema coma, which may cause severe hypothermia, is truly an endocrine emergency and needs early recognition and proper treatment. We present a case of a 47-year-old female with a history of hyperthyroidism status post thyroidectomy was brought to the ED because of progressive dyspnea associated with general weakness for one month. Hypothermia with decreased mental status and general edema were also noted. Hypothyroidism was confirmed by laboratory examination and myxedema coma was diagnosed. The patient recovered well and there was no complication noted after intensive care with supplements of thyroxine and glucocorticoid. In conclusion, myxedema coma should be considered in decrease mental status and hypothermic patients with a history of hypothyroidism or thyroidectomy. Besides, long-standing hypothyroidism or encountering precipitating acute events, such as sepsis, cerebrovascular accident, gastrointestinal bleeding, exposure to cold, trauma or certain medications may also cause this condition. High mortality rate was reported, and the treatment should be instituted in patient with presumed myxedema coma without delay.

**Key words:** *general edema, hypothermia, hypothyroidism, myxedema coma, thyroxine*

## Introduction

Myxedema coma is rare with an incidence of 0.22 cases per million per year, however may cause high mortality rate (25-60%) without early diagnosed and proper treatment.<sup>1-3</sup> The aim of this report is to share a case of hypothermia with myxedema coma and dyspnea at emergency department (ED). With the supplement of thyroxine, glucocorticoid and intensive supportive care, the patient's condition had improved gradually and finally discharged.

## Case Report

A 47-year-old female was brought to ED due to progressive dyspnea associated with general weak-

ness which had lasted for one month. The patient was drowsy with low ear temperature of 31.6°C at triage. Furthermore, general edema, chills, body weight increase, and hair loss were also noted. She did not have fever, cough, chest pain, cold sweating, poor appetite, hemiparesis, bleeding focus, trauma, certain substances use or exposure to cold. She has thalassemia and a thyroidectomy for hyperthyroidism 5 years ago; however, she did not go through regular medication control.

Besides hypothermia, her vital signs showed the respiration of 26 bpm, pulse of 62 bpm, and blood pressure of 111/66 mmHg on arrival. Her physical examination showed pale conjunctiva, general edema, and the digital rectal examination revealed normal

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brownish stool. The initial blood tests showed blood sugar 158mg/dl, white blood cell count 3100/uL (normal 3500-11000/uL), hemoglobin 3.6 g/dL (normal 12-16 g/dL), C-reactive protein 6.59 mg/L (normal < 5 mg/L), aspartate transaminase 38 U/L (normal  $\leq$  34 U/L), sodium 129 mEq/L (normal 134-148 mEq/L), and potassium 3.3 mEq/L (normal 3.6-5.0 mEq/L). Other blood tests, including creatinine, troponin-I, albumin, calcium, and cortisol level were within normal range. Her electrocardiogram reported sinus bradycardia with a heart rate of about 56, and chest X-ray film revealed cardiomegaly. Her echocardiogram showed large amount pericardial effusion but without tamponade sign.

According to the above test results and the occurrence of hypothermia came together with the conditions of decreased mental status and general edema, myxedema coma was highly suspected. Hypothyroidism was later been confirmed, with high thyroid-stimulating hormone 90.540 uIU/mL (normal 0.35-5.50 uIU/mL) and low free T4 0.22 ng/dL (normal 0.93-1.56 ng/dL).

The patient received oral thyroxine sodium 0.2 mg daily for 10 days, followed by 0.1 mg daily for maintenance. Besides, one dose of intravenous hydrocortisone 100 mg, and intravenous methylprednisolone 40 mg per 8 hours for 1 day were given. She had been intubated due to hypercapnia respiratory failure, and inotropic agents were administered by the reason of hypotension. Blood transfusion was also provided due to severe anemia. She was being rewarmed by heat lamp, and the hypothermia had been corrected within one day. On the 11th day, she had been extubated and discharged on the 20th day.

## Discussion

Hypothermia patient is rarely encountered in ED, but once they appeared, prompt diagnoses and treatments are needed. The mechanisms of hypothermia are increase heat loss, decrease heat production and impaired regulation of body temperature. Exposure to cold, vasodilation cause by medications, skin disorders such as burn injury, can increase heat loss and lead to hypothermia. Hypothyroidism, hypoadrenalism, malnutrition, hypoglycemia, and neuromuscular inefficiency can decrease heat production and also cause hypothermia. In addition, hypothermia could happen while peripheral impaired regulation caused by diabetes mellitus, neuropathy, and central impaired

regulation such as cerebrovascular accident, intracranial hemorrhage, drugs. Other causes of hypothermia include sepsis, uremia, and trauma.<sup>4</sup>

Myxedema coma is defined as decreased mental status, hypothermia, and other symptoms related to slowing functions of multiple organs due to severe hypothyroidism<sup>5</sup> and should be considered in patient, especially old females with a history of hypothyroidism or thyroidectomy.<sup>3</sup> Besides, hypotension, hyponatremia, hypoglycemia, bradycardia, hypoventilation, anemia and hypercapnia may also be found in those patients. Myxedema coma could be precipitated by an acute event such as sepsis, cerebrovascular accident, myocardial infarction, gastrointestinal bleeding, exposure to cold, trauma or certain medications, especially lithium, amiodarone and opioids.<sup>3,6</sup> Furthermore, hypothyroidism patients may have congestive heart failure and pericardial effusion even without preexisting cardiac diseases.<sup>7</sup> Diagnosis based on clinical presentations and medical histories, and prompt treatments should not be delayed because of waiting for the results of thyroid function tests.

Treatment for myxedema coma includes thyroid hormone therapy and intensive supportive care. According to recent study, combined therapy is suggested with T4 (levothyroxine) and T3 (triiodothyronine, liothyronine) rather than T4 alone. Intravenous T4 200 to 400 mcg once, followed by 50 to 100 mcg daily until the patient can take T4 orally, and initial dose of 5 to 20 mcg intravenous T3, followed by 2.5 to 10 mcg every 8 hours at the same time are recommended. T3 is discontinued if clinical improvement and the patient are stable. Also, administering high-doses of glucocorticoids is suggested (e.g. intravenous hydrocortisone 100 mg every eight to twelve hours for two days, then lower doses) as long as coexisting adrenal insufficiency is excluded.<sup>8</sup> Reported mortality rate is around 25% to 60%, and old age patients with cardiac complications, poor conscious level, persistent hypothermia, sepsis, and delayed treatment are possible risk factors for poor prognosis.<sup>1,9-12</sup> Undoubtedly, myxedema coma is truly an endocrine emergency and needs early recognition and proper treatment.

## Conclusion

We herein present a case of myxedema coma with hypothermia, general weakness and dyspnea. Although there is high mortality rate of myxedema coma, the patient had been cured and finally dis-

charged after thyroxine, glucocorticoid supplement, and intensive care are provided. Old females or patients that are having medical history record of thyroidectomy, come together with “cold”, “slow”, and “weak” conditions need to be taken note. As long as myxedema coma is suspected, treatments should be administered without any delay.

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