

Neuropsychiatric manifestations

- In patients with myxedema coma, there may be a history of lethargy, slowed mentation, poor memory, cognitive dysfunction, depression, or even psychosis, as can also be seen in patients with uncomplicated hypothyroidism. They do not complain of these symptoms, however, because of their impaired state of consciousness.
- Focal or generalized seizures may be seen in up to 25% of patients, possibly related to hyponatremia, hypoglycemia, or hypoxemia because of reduced cerebral blood flow.

neuro-psychiatric features

Hypothermia

- As noted previously, hypothermia is present in virtually all patients and may be quite profound. In many of the reported cases, hypothermia was the first clinical clue to the diagnosis of myxedema coma.
- The ultimate response to therapy and survival has been shown to correlate with the degree of hypothermia

hypothermia

Cardiovascular manifestations

- Typical cardiovascular findings in myxedema coma as well as in hypothyroid heart disease include nonspecific electrocardiographic abnormalities, cardiomegaly, bradycardia, and reduced cardiac contractility.
- Low stroke volume and cardiac output occur as a result of the reduction in cardiac contractility, but frank congestive heart failure is rare. Cardiac enlargement may be real and attributable to ventricular dilatation or could represent a pericardial effusion.
- Hypotension may be present because of decreased intravascular volume and cardiovascular collapse, and shock may occur late in the course of the disease. In shock, the hypotension may be refractory to vasopressor therapy unless thyroid hormone is also being given.

cardiac features

Respiratory system

- The reduced hypoxic respiratory drive and decreased ventilatory response to hypercapnia known to occur in hypothyroidism are likely responsible for the respiratory depression commonly seen in myxedema coma, but impaired respiratory muscle function and obesity may exacerbate the hypoventilation
- The respiratory depression leads to alveolar hypoventilation and progressive hypoxemia and, ultimately, to carbon dioxide narcosis and coma. Although there are many contributing causes to the coma in these patients, the principal factor seems to be a depressed respiratory center response to carbon dioxide.
- Mechanically assisted ventilation is required in most patients, irrespective of the cause of the respiratory depression and hypoventilation. Respiration may be impaired in these patients as well by the presence of pleural effusions or ascites, by reduced lung volume, and by macroglossia and edema (myxedema) of the nasopharynx and larynx, which serve to reduce the effective airway opening.
- Even after initiation of thyroid hormone therapy, assisted ventilation may have to be continued because of delayed recovery

respiratory features

Renal and electrolyte manifestations

- Patients may have bladder atony with urinary retention. Hyponatremia in any patient may cause lethargy and confusion, and hyponatremia and a reduced glomerular filtration rate are consistent findings in patients with myxedema coma.
- The hyponatremia results from an inability to excrete a water load, which is caused by decreased delivery of water to the distal nephron and excess vasopressin secretion. Urinary sodium excretion is normal or increased, and urinary osmolality is high relative to plasma osmolality.

renal & electrolytes

Gastrointestinal manifestations

- Patients with myxedema coma may have anorexia, nausea, abdominal pain, and constipation with fecal retention. A distended quiet abdomen may be present, reduced intestinal motility is common, and paralytic ileus and megacolon may occur.
- A type of neurogenic oropharyngeal dysphagia has been described that is associated with delayed swallowing, aspiration, and risk of aspiration pneumonia.
- Gastric atony, if present, may serve to reduce absorption of oral medications.

gastro-intestinal features

Infections

- Because hypothermia is the rule in myxedema coma, the presence of a "normal" temperature should be a clue to underlying infection. Other signs of infection, such as diaphoresis and tachycardia, are also absent. Patients who fail to survive often have been shown to have had unrecognized infection and sepsis.
- The possibility of an underlying infection should always be considered while maintaining a low threshold for initiation of systemic antibiotic coverage. The presence of pneumonia also worsens or even causes hypoventilation, and there is a heightened risk of pneumonitis attributable to aspiration caused by neurogenic dysphagia, semicoma, or seizures.

infections

- Myxedema coma represents the most extreme form of hypothyroidism, so severe as to readily progress to death unless diagnosed promptly and treated vigorously.

- Like uncomplicated hypothyroidism, the diagnosis rests on a determination of serum thyroid-stimulating hormone (TSH). Most hospital and commercial laboratories can turn around aTSH result within hours, and once the diagnosis is made, therapy should be initiated immediately. Nevertheless, even with reasonably early diagnosis and customary therapy, the mortality rate approaches 50% to 60%.

general

- Because hypothyroidism is some eightfold more common in women than in men, most patients who might present with myxedema coma are women.
- Because hypothyroidism is most common in the later decades of life, most of these women are elderly.

epidemiology

- The probable diagnosis of myxedema coma should readily come to mind, given a patient with a history of or physical findings compatible with hypothyroidism in the presence of stupor, confusion, or coma, especially in the setting of hypothermia.

- Given a reasonable index of suspicion, therapy with thyroid hormone should be begun immediately, while awaiting the results of measurements of serum thyrotropin (TSH) and thyroxine(T4). In elderly patients, however, especially those with underlying cardiac disease, thyroid hormone therapy should be undertaken more cautiously because of the risks.

-thyroid hormones can be measured in several hours on a routine basis or, if necessary, should be so requested on an emergency basis. Although markedly elevated serum TSH would be expected, patients with severe nonthyroidal systemic illness may demonstrate a phenomenon parallel to the "euthyroid sick" syndrome, which can be called the "hypothyroid sick" syndrome. In such circumstances, pituitary TSH secretion is reduced and the blood levels may not be as high as one might otherwise expect.

- approximately 5% of cases of myxedema coma are diagnosed on the basis of central hypothyroidism and could have normal or low serum TSH concentrations.

- Irrespective of whether the disease is primary or secondary thyroid failure, all patients with myxedema coma have low serum total and free T4 and triiodothyronine (T3) concentrations.

diagnosis

precipitating factors

Box 1. Myxedema coma: exacerbating or precipitating factors

Hypothermia

Cerebrovascular accidents

Congestive heart failure

Infections

Drugs

Anesthetics

Sedatives

Tranquilizers

Narcotics

Amiodarone

Lithium carbonate

Gastrointestinal bleeding

Trauma

Metabolic disturbances exacerbating myxedema coma

Hypoglycemia

Hyponatremia

Acidosis

Hypercalcemia

Hypoxemia

Hypercapnia

- Whatever the precipitating cause, the course is typically one of lethargy progressing to stupor and then coma, with respiratory failure and hypothermia, all of which may be hastened by the administration of drugs that depress respiration and other brain functions.

- The characteristic features of severe hypothyroidism are present, such as dry skin, sparse hair, a hoarse voice, periorbital edema and nonpitting edema of the hands and feet, macroglossia, and delayed deep tendon reflexes, and moderate to profound hypothermia is common.

- In addition to hyponatremia and hypoglycemia, a routine laboratory evaluation may indicate anemia, hypercholesterolemia, and high serum lactate dehydrogenase and creatine kinase concentrations

general features

myxedema
coma features
& diagnosis
[created by
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02/12/07]