

Case report

# The Effect of Thiamine Administration on Delayed Recovery from Anesthesia: A Case report

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## ABSTRACT

For anesthesiologists, delayed recovery from general anesthesia frequently poses a challenge because they need to quickly establish the most effective treatment by accurately diagnosing the underlying cause. Nonalcoholic Wernicke's encephalopathy (WE) is a distressing neuropsychiatric syndrome caused by thiamine deficiency. Despite the fact that many case reports on WE have been published, more research is needed to guide the diagnosis and treatment of nonalcoholic WE. Certain tests can help confirm a diagnosis of nonalcoholic WE. Brain magnetic resonance imaging (MRI), routine blood tests, blood thiamine assessments, and other ancillary investigations are among the tests performed. We aim to highlight a case of delayed recovery from general anesthesia that fully recovered after the administration of thiamine.

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## INTRODUCTION

Nonalcoholic Wernicke's encephalopathy (WE) is a rare but devastating neurological pathology due to thiamine deficiency [1]. It is a known complication of hyperemesis gravidarum and repeated vomiting, chronic intake of diuretics, gastrectomy, malnutrition, pregnancy, and chronic hemodialysis [2-4]. Thiamine deficiency is best confirmed by clinical response to thiamine treatment. Although thiamine deficiency can be confirmed by demonstrating decreased whole blood or erythrocyte transketolase activity [3], or specific abnormalities on the brain magnetic resonance imaging [5], we believe that, the clinical response to thiamine treatment is a reliable alternative approach.

Delayed recovery from anesthesia is frequently multifactorial, and the main cause can be due to depletion of body nutrients (e.g., thiamine depletion) or pharmacological causes [6]. Furthermore, delayed recovery is usually the result of an undiagnosed condition or a medical error. Here, we report a case of an elderly female patient with delayed awakening from general anesthesia after undergoing external interventricular drain insertion.

## Case report

In 2008, in a private clinic in Tripoli – Libya, an 80-year-old, 45kg lady with obstructive hydrocephalus, had external interventricular drain insertion under general anesthesia. Her complete blood counts, biochemistry and coagulation profile were within normal limits. She was hypertensive, and had stable vital parameters.

After pre-oxygenation, anesthesia was induced with 100 mcg fentanyl and 130 mg propofol intravenous (IV). Forty milligrams of Atracurium was administered IV for neuromuscular blockade, and after tracheal intubation, lungs were mechanically ventilated to maintain end-tidal carbon dioxide between 30 and 35 mm Hg. Anesthesia was maintained with nitrous oxide (60%) in oxygen and end-tidal isoflurane (1.5%). Patient received 1.0 L crystalloids. The surgery lasted for 1 h, then the patient received 2.5mg Neostigmine and 1.0 mg Atropine.

Post-operatively; she failed to recover and remained deeply comatose and ventilator-dependent for 4 hours. During the recovery trials the patient received 80mcg of Naloxone but she remained unresponsive, relaxed with normal readings of blood pressure and heart rate. Postoperative arterial blood gas analysis and electrolytes were within normal limits. The

blood sugar level showed euglycemia. She immediately recovered and extubated after thiamine administration (200 mg intravenous dose).

## DISCUSSION

Following general anesthesia, delayed recovery of varying degrees can occur for a variety of reasons, either alone or in combination, and these reasons can be drug- or non-drug-related [6].

Overdose, anesthesia type and duration, potentiation by other drugs, and prolonged neuromuscular blockade (as seen in acidosis and renal failure) are all known drug-related factors [7]. Non-drug causes such as metabolic, neurological, and respiratory failure can all have an impact on anaesthesia recovery. Metabolic causes of delayed recovery include hypoglycemia, severe hyperglycemia, hypothyroidism, hepatic and renal diseases, acid-base and electrolyte imbalances, and hypothermia [8].

Many anesthetists report incidents of delayed recovery from general anesthesia (sometimes for several days) that are not explainable by organic or pharmacological causes as there was no analgesic or sedative overdose. In this case, delayed recovery was possibly due to unrecognized thiamine deficiency (Nonalcoholic Wernicke's encephalopathy) because of malnutrition.

The documented response to thiamine administration in our patient suggests that thiamine deficiency could be the cause of her delayed recovery. In these circumstances, it is advised to consider thiamine administration if conventional methods to wake these patients up from general anesthesia fail.

## CONCLUSION

Thiamine administration should be considered in patients with unexplained delayed recovery from general anesthesia. We recommend exclusion of thiamine deficiency prior to general anesthesia.

**Conflict of Interest.** There are no financial, personal, or professional conflicts of interest to declare.

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