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Case Report

Syndrome of Inappropriate Secretion of Antidiuretic Hormone due to Selective Serotonin Reuptake Inhibitors After Pancreaticoduodenectomy for Carcinoma of the Ampulla of Vater: Case Report

Ryota Iwase, Hiroaki Shiba, Takeshi Gocho, Yasuro Futagawa, Shigeki Wakiyama, Yuichi Ishida, Takeyuki Misawa, Katsuhiko Yanaga

Department of Surgery, The Jikei University School of Medicine, Tokyo, Japan

A 68-year-old man underwent pancreaticoduodenectomy with lymph nodes dissection for carcinoma of the ampulla of Vater. The patient had anxiety neurosis and had been treated with a selective serotonin reuptake inhibitor (SSRI). Postoperatively, SSRI was resumed on postoperative day 2. His serum sodium concentration gradually decreased, and the patient was given a sodium supplement. However, 11 days after the operation, laboratory findings included serum sodium concentration of 117 mEq/L, serum vasopressin of 2.0 pg/mL, plasma osmolality of 238 mOsm/kg, urine osmolality of 645 mOsm/kg, urine sodium concentration of 66 mEq/L, serum creatinine concentration of 0.54 mg/dL, and serum cortisol concentration of 29.1 μg/dL. With a diagnosis of syndrome of inappropriate secretion of antidiuretic hormone (SIADH), the antianxiety neurosis medication was changed from the SSRI to another type of drug. After switching the medication, the patient made a satisfactory recovery with normalization of serum sodium by postoperative day 20.

Key words: SIADH – Pancreaticoduodenectomy – Surgical stress – SSRI

The syndrome of inappropriate secretion of antidiuretic hormone (SIADH) is characterized by hyponatremia, elevated serum antidiuretic hormone (ADH) concentration, and high urine osmolality despite low plasma serum osmolality. The factors that predispose a patient to SIADH include pulmonary disorders, malignant diseases, disorders of the central nervous system, drugs, and surgical

Reprint requests: Ryota Iwase, MD, Department of Surgery, The Jikei University School of Medicine, 3-25-8, Nishi-Shimbashi, Minato-ku, Tokyo 105-8461, Japan.
Tel.: +81 3 34331111 (ext. 3401); Fax: +81 3 54724140; E-mail: ryotaiwa@jikei.ac.jp

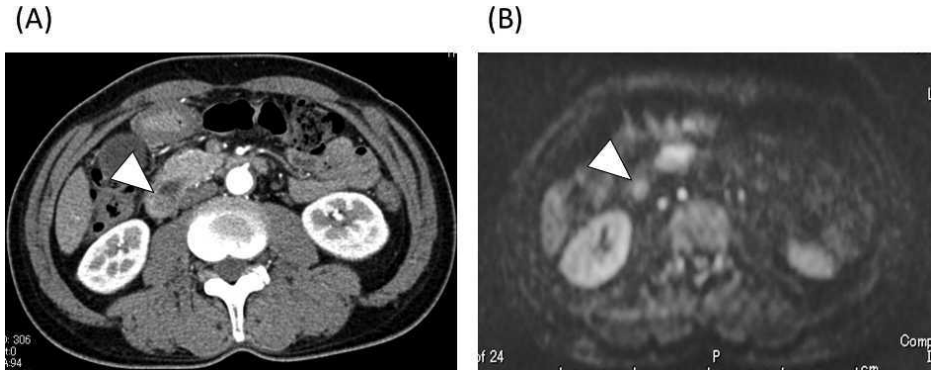

Fig. 1 Enhanced computed tomography (A) and magnetic resonance imaging (B) revealed a tumor in the ampulla of Vater (arrowhead).

stress.[1] We herein report a case of SIADH due to selective serotonin reuptake inhibitors (SSRIs) after pancreaticoduodenectomy for carcinoma of the ampulla of Vater.

Case Report

A 68-year-old man was admitted for examination and treatment for dilatation of intrahepatic bile duct and liver dysfunction. The patient had anxiety neurosis and had been treated with an SSRI. Enhanced computed tomography (CT) and magnetic resonance imaging (MRI) revealed a tumor in the ampulla of Vater (Fig. 1). Endoscopic ultrasonography (EUS) demonstrated a 30-mm- diameter hypoechoic tumor in the ampulla of Vater. Fine needle aspiration biopsy performed under EUS yielded a pathologic diagnosis of carcinoma in adenoma. With a diagnosis of carcinoma of the ampulla of Vater, the patient underwent pancreaticoduodenectomy with lymph nodes dissection. At 2 days post operation, the SSRI was restarted for anxiety neurosis. Oral intake was restarted at 5 days post operation. Serum sodium concentration gradually decreased, and the patient was given a sodium supplement. However, 11 days after the operation, laboratory findings included serum sodium concentration of 117 mEq/L, serum vasopressin of 2.0 pg/mL, plasma osmolality of 238 mOsm/kg, urine osmolality of 645 mOsm/kg, urine sodium concentration of 66 mEq/L, serum creatinine concentration of 0.54 mg/dL, and serum cortisol concentration of 291 μg/dL. Table 1 lists criteria for diagnosis of SIADH.[2] With the diagnosis of SIADH, the patient's antianxiety neurosis medication was changed from an SSRI to a benzodiazepine. After switching the medication, the patient made a satisfactory recovery with normalization of serum sodium (Fig. 2) and was discharged on the 33rd postoperative day. He remains well with no evidence of cancer recurrence as of 8 months after resection.

Table 1 Diagnostic criteria for the diagnosis of SIADH

Essential criteria
(1) Plasma osmolality <270 mOsmol/kg.
(2) Inappropriate urinary concentration (Uosm > 100 mOsm/kg) of a 20 mL/kg water load in 4 hours and/or failure to dilute Uosm.
(3) Patient is clinically euvolemic <100 mOsm/kg.
(4) Elevated urinary sodium (>40 mmol/L), with normal sodium and water intake.
(5) Exclude hypothyroidism and glucocorticoid deficiency.
Supplemental criteria
(1) Abnormal water load test (*i.e.*, inability to excrete at least 90%).
(2) Plasma vasopressin level inappropriately elevated relative to plasma osmolality.

Uosm, urine osmolality.

Discussion

SIADH has been reported as an uncommon complication after surgery. Drugs such as chemotherapeutic agents,[3] antidiuretics, antidiabetics, and antidepressants including SSRIs are known causes of SIADH, and SSRIs are one of the major agents.[1,4,5] Wilkinson *et al* reported that approximately 1 in 200 elderly people treated per year with an SSRI developed hyponatremia due to SIADH, and the hyponatremia was detected at the median of 13.5 days (mean 18.6, range 4–64) after commencing the SSRI.[6]

For management of postoperative SIADH, administration of isotonic sodium chloride is recom-

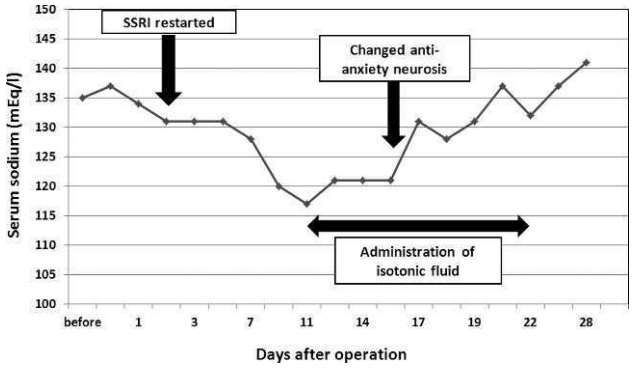

Fig. 2 Changes in the serum sodium concentration in postoperative period. After switching the antianxiety neurosis medication, the patient made a satisfactory recovery with normalization of the serum sodium.

mended as the initial treatment.[1,7] In our patient, hyponatremia progressed after starting administration of isotonic sodium chloride and improved after switching the antianxiety medication. Therefore, the SSRI was the main cause of SIADH in our patient.

Surgical stress had been considered as one of the causes of SIADH as well as the SSRI.[4,8,9] However, SIADH after abdominal surgery is rare.[4] Loss of extracellular fluid (ECF), cerebral damage due to anesthesia, dysfunction of heart or kidney, pain, and use of medication have been reported as causes of SIADH after operation.[4,10,11] However, the relationship between surgical stress and SIADH is still unclear.

In conclusion, SIADH is a possible complication after surgery; hence we have to pay special attention to the serum sodium level, especially in patients taking antidiuretics, antidiabetics, or antidepressants.

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