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EFFECTIVE MANAGEMENT OF SYNDROME OF IN APPROPRIATE ANTI DIURETIC HORMONE

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ABSTRACT

Syndrome of inappropriate anti diuretic hormone is most frequent pituitary gland disorder it mostly affects the electrolyte imbalance especially in hyponatremia. In the diagnosis of SIADH is assessing the state of extracellular fluid volume, both clinically and by laboratory measurement. SIADH should be treated to cure symptoms. The common therapeutic management is fluid restriction, demeclocycline, hypertonic saline, urea, vasopressin receptor antagonist called vaptons. A few studies have been performed the efficacy of vaptans specifically in SIADH patient. Several studies of short duration reported that vaptons were efficacious in increasing serum sodium concentration.

INTRODUCTION

ADH/AVP Is a nine amino acid peptide secreted in posterior pituitary gland that is synthesized in hypothalamus and transported to posterior pituitary where it is stored.AVP secretion is regulated by effective osmotic pressure of body fluids. ADH is stimulating contraction of arteries and capillaries. ADH otherwise called as vasopressin. SIADH means excessive level of anti diuretic hormone (hormone that helps the kidney, and body, conserve the correct amount of water) are produced [1].

SIADH

- It is a disorder of impaired water excretion caused by the inability to suppress the secretion of antidiuretic hormone (ADH).
- Inappropriate, continued secretion or action of ADH despite normal or increased plasma volume.
- Results in impaired water excretion, and subsequently hyponatremia and hypo-osmolality.

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- The release of ADH is not inhibited by a reduction in plasma osmolality.
- The non-physiological secretion of AVP results in enhanced water reabsorption, leading to dilutional hyponatremia.
- It is characterized by fluid retention, serum hypoosmolality, dilutional hyponatremia, hypochloremia, concentrated urine in the presence of normal or increase intravascular volume and normal renal function.

Cause

This syndrome most commonly occurs in older adult and very rare in children and has different causes list out below

Central Nervous System Disorders

Head injury (skull fracture, subdural hematoma, subarachnoid hemorrhage), Cerebrovascular injury, Brain tumors, Infection (encephalitis, meningitis), Cerebral atrophy, Guillain-Barré syndrome, Systemic lupus erythematosus

Drug Therapy

Carbamazepine (Tegretol), chlorpropamide(Diabinese),

General anesthesia agents, Opioids, Oxytocin , Thiazide diuretics, Selective serotonin reuptake inhibitors antidepressants, Tricyclic antidepressants, Antineoplastic agents (vincristine [Oncovin], vinblastine [Velban]

Miscellaneous Conditions

Hypothyroidism, Lung infection (pneumonia, tuberculosis, lung abscess), Chronic obstructive pulmonary disease, Positive pressure mechanical ventilation, HIV

CLINICAL FEATURES

- Signs and symptoms depends on both degree of hyponatremia and rate at which hyponatremia develops.
- When sodium concentration decreased slowly- asymptomatic or non specific symptoms like anorexia, nausea, vomiting, irritability, headaches and abdominal cramps.
- Rapid decline- more severe symptoms.
- Serum sodium concentration <120 mEq/L or serum osmolality <240mOsm/kg is serious irrespective of rate of decline.
- Patient can have cerebral edema manifesting as headache, nausea, restlessness, irritability, muscle cramps, generalized weakness, hyporeflexia, confusion, coma, seizures, brainstem herniation or death.

DIAGNOSTIC EVALUATION

- Careful history– Comorbidity, current medications and patient's symptoms.
- No significant findings in physical examination but signs of dehydration or edema would make diagnosis unlikely.

Key points in diagnosing SIADH are-

Serum sodium concentration.
Tonicity of plasma and urine
Urine sodium concentration
Clinical volume status.

Essential Features-

- Plasma osmolality <275 mOsm/kg.
- Urinary osmolality >100 mOsm/kg.
- Urinary Na >120 mEq/l with normal dietary salt intake.
- Normal thyroid, adrenal, cardiac, liver and kidney function.
- Clinical evaluation no clinical signs of volume depletion/ excess like tachycardia, decreased skin turgor, dry mucus membrane, edema, ascites.
- No recent use of diuretic agent.

Supplemental features

- Plasma uric acid <4 mg/dl.
- Blood urea nitrogen <10 mg/dl.
- Correction of hyponatremia through fluid restriction.

CEREBRAL SALT WASTING SYNDROME

Rare syndrome seen in patients with cerebral tumors, subarachnoid hemorrhage, patients who have undergone trans-sphenoidal pituitary surgery. Mimics SIADH I. Hyponatremia, increased urine osmolality, urine Na > 20 mEq/l and urine osmolality > serum osmolality. It represents appropriate water resorption with salt wasting and a secondarily hypovolemic state

Treatment depends on-

Symptoms

- Serum sodium concentration
- Rapidity of onset of hyponatremia
- Primary etiology

Mild asymptomatic hyponatremia (serum Na >125mEq/L)

Fluid restriction is the 1st line treatment. It generally improves with correction of underlying cause and restriction of free fluid intake to 800-1000 ml/d. If no response, fluid intake can be restricted to 500-600 ml/d.

Severe symptomatic hyponatremia (serum Na <125mEq/L)-

- Fluid restriction
- Hypertonic saline- infused via pump and urine osmolality can be followed to guide therapy.
- Hypertonic saline can be switched to isotonic saline when urine osmolality is <300 mOsm/L.
- Aggressive and overly rapid correction may induce central pontinemyelinosis.
- Serum Na level should be raised at rate no faster then 1-2 mEq/h and rate should not exceed 8-12 mEq/d.
- Once serum Na rises above 125 mEq/l, risk of seizures and death is reduced and daily correction is slowed to 5-6 mEq/d.
- demeclocycline (Declomycin) and lithium may be administered. These agents block the effect of ADH on the renal tubules, thereby allowing more dilute urine.
- Loop diuretic in order to increase free water excretion rates, loop diuretic was effective one in SIADH. Patient have complication of pulmonary edema during treatment with loop diuretic can help in avoiding vascular overfilling.
- Rapid correction of hyponatraemia may need hemodialysis, and veno-venous haemofiltration has been shown to induce a more gradual correction of hyponatremia and other form of slow dialysis

treatment such as slow low efficiency daily dialysis may be equally effective.

Administer orally available aquaretic agent, short duration reported that vaptons were efficacious in increasing serum sodium concentration [2].

Nursing Management

- Monitor pulmonary artery pressure and central venous pressure hourly or more frequently, its help to identify capacity of vascular system.
- Monitor hourly intake and output, and determine fluid balance frequently
- Check the patient weight frequently, if weight changes indicate fluid imbalance.
- Frequently monitor ECG for dysrhythmias resulting from electrolyte imbalance.
- Assess the hydration status every 4 hour. Note skin turgor, edema, or crackles and complaint of thirst.
- Assess the pressure ulcer development secondary to edematous state
- Restrict fluid as ordered, generally less than 500ml per day.
- Administered potassium supplement, assess renal function and ensure adequate urine output before administering potassium.

Avoid alcohol and stimulant drugs [3].

CONCLUSION

SIADH means excessive level of anti diuretic hormone. The most common symptoms produce hyponatremia and electrolyte imbalance. The common therapeutic management is fluid restriction, demeclocycline, hypertonic saline, urea, vasopressin receptor antagonist called vaptons.

STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964Helsinki declaration and its later amendments orcomparable ethicalstandards. This article does notcontain any studies with animals performed by any of the authors.

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Nil

CONFLICT OF INTEREST

No interest

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