

## CASE REPORT

### Colonic irrigation-induced hyponatremia

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#### Abstract

A 42-year-old Chinese woman presented with transient confusional state and memory loss due to acute water intoxicational hyponatremia complicating colonic irrigation (enemas) used as an alternative medicine to promote health. Although there is no evidence that such “antiauto-intoxication” technique conveys true benefit in any condition, this form of “quackery” may actually cause harm, such as water intoxication as in this case.

*Key words:* hyponatremia, water intoxication, colonic irrigation

#### INTRODUCTION

Hyponatremia, defined as a serum sodium below 135 mmol/L, is a common and important electrolyte abnormality that is encountered in a wide variety of clinical settings. It can occur in isolation or in most cases as a complication of other medical illnesses. Sodium homeostasis is vital to the normal physiological functions of the body's cells. Hyponatremia is usually of clinical significance when it reflects a drop in the serum osmolality (i.e. hypotonic hyponatremia) or is associated with hyperkalemic stress as in Addison's disease. Hypoosmolality indicates excess total body water relative to body solutes which can be due either to solute depletion or solute dilution or as in most cases, a combined mechanism of both.

A serum sodium below 115 mmol/L constitutes severe hyponatremia, a level at which clinical symptoms will manifest due to hypoosmolality. Symptoms primarily related to the hyponatremia range from nausea and malaise in mild cases to lethargy, decrease level of consciousness, headache, and eventually seizures and coma with more acute and severe drop in serum sodium. These neurological symptoms are due to osmotic fluid shift into the brain with resultant cerebral oedema. The severity of the neurological symptoms correlate well with both the rapidity and the level of decrease of the serum sodium. A gradual decrease in the serum sodium, even to very low levels, may be well tolerated if it occurs over several weeks due to neuronal adaptation.<sup>1</sup>

#### CASE REPORT

A 42-year-old Chinese woman presented with poor memory for the past one month followed by acute confusion on the day of admission. There was no history of fever, headache, photophobia, vomiting or diarrhoea. She denied using diuretics or purgatives. She was diagnosed to have diabetes mellitus one year ago but defaulted treatment; instead she was using self-prescribed herbs to control her diabetes. In addition, she had been using regular colonic irrigation/enemas for the past 6 months for body detoxification and bowel cleansing. The procedure required her to instill (using a plastic tube) into her rectum 400-500 ml of tap or distilled water to which was added a tablespoon of apple cider vinegar or coffee. The mixture was then retained for 10-15 minutes with the patient lying on her right side with both knees drawn to her chest. Using stomach massage and rolling from side to side, the enema fluid was made to flow up the descending colon, across the transverse colon and finally down the ascending colon. The patient would then get a strong urge to release. Individuals undertaking colonic irrigations were advised to take several kinds of oral supplements which include potassium salts prior to the procedure. Unfortunately the patient forgot to take her oral supplement on the day of admission and she was admitted for acute confusional state.

On examination the only significant finding was confusion to place, time and people. The diagnosis was first suggested when results of

initial blood tests returned two hours later. Her blood urea was 1.4 mmol/L (normal 2.5 – 6.4 mmol/L), serum creatinine 52 umol/L (normal 62 – 133 umol/L), serum sodium 110 mmol/L (normal 135 – 150 mmol/L) and potassium 3.7 mmol/l (normal 3.5 – 5.0 mmol/L). Her random blood sugar and osmolality was 6.4 mmol/L (normal 4.0 – 7.8 mmol/L) and 235.2 mmol/L (normal 285.0 – 295.0 mmol/L) respectively. Her electrocardiogram and chest radiography were normal.

She was treated with normal saline infusion. The following day she made a complete recovery. Her serum sodium had increased to 124 mmol/L. Although she had noticed poor memory the last few months, she managed to recall the events leading to her hospitalization. She was advised to stop her colonic irrigation practice.

## DISCUSSION

Colonic irrigation is a traditional naturopathic technique frequently used in the preparation for colorectal endoscopy, radiology, and surgery, and for the treatment of constipation and various disorders associated with autointoxication. Autointoxication is an ancient theory based on the belief that intestinal waste products of incomplete digestion can poison the body and are a major contributor to many, if not all, diseases.<sup>2</sup> Symptoms of autointoxication were said to include fatigue, depression, anxiety, neurasthenia, poor appetite, headache, fever, asthma and epilepsy. This concept of disease can be traced back to most ancient cultures of medicine. Thus to minimize autointoxication, the contact time of the toxic material in the intestines had to be shortened. Regular bowel movement remained the key to good health. If that is not possible, purgatives of all sorts were the answer. Enemas of various types thus became an important part of Chinese, Hindu, Sumerian, Egyptian, and other medical traditions. Throughout the history of medicine, the colon was treated “with attacks from above with purges, attacks from below, with douches and frontal attacks by the surgeon.”<sup>3</sup> Evacuation enemas were given for immediate results, and retention enemas offered the additional options of administering therapeutic agents. Anything from honey, wine, coffee (as in our patient), and beer to less benign substances such as urine or tobacco hsr been used.

The transient hyponatremic hypoosmolar neurological disturbance in our patient is most likely due to her “faulty” colonic irrigation on

the day of admission (she omitted her oral supplement). When hypotonic solutions are placed in the colon, a water reservoir is created which is rapidly absorbed by passive diffusion into the capillary network of the colonic mucosa along osmotic gradients. Simultaneously there is an osmotically-driven loss of plasma electrolytes into this hypotonic reservoir in the gut. As plasma concentrations of electrolytes decrease and water increases, tissue cells are forced to equilibrate water and electrolytes, resulting in water intoxication and cell swelling. The resultant cerebral oedema caused the transient self-limiting neurological disturbance in this patient. Fortunately there did not appear to be any detectable permanent neurological damage.

Although the practice of colonic irrigation declined in the early 90’s, there has been a resurgence of its popularity again. Today colon therapy is an integral part of the therapeutic armamentarium of most (non-medically qualified) alternative practitioners around the world.<sup>4-6</sup> Accurate data on its prevalence are not available although aggressive advertising and promotional texts abound. Although most proponents of colonic irrigation deny any adverse effects, risks of electrolyte imbalance, water intoxication and deaths have been reported.<sup>7,8</sup>

## REFERENCES

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