

A Rare Case of Water Intoxication in Unusual Chiropractic Prescription: A Medico-Legal Analysis Due to Alleged Malpractice

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Abstract

Introduction. Water intoxication is a well-recognized cause of symptomatic hyponatremia, whose often fatal consequences are described in a wide variety of conditions such as psychiatric disorders, metabolic dysfunctions, child abuse, drug abuse and several medical procedures.

The case. We here report a rare case of a 67-year-old woman with severe acute hyponatremia due to an excessive voluntary water intake – 14 litres in two days – following a chiropractic prescription. The patient developed sudden severe symptoms, including water retention, sensory alteration, altered mental status and tonic-clonic seizures. She was thus admitted to the Intensive Care Unit with a diagnosis of coma due to electrolyte alterations following water intoxication.

Conclusion. The evaluation, in the present case, of the medico-legal implications related to malpractice involving a practitioner of Complementary and Alternative Medicine, led to the admission of a professional liability of the chiropractor. *Clin Ter* 2021; 172 (4):250-252. doi: 10.7417/CT.2021.2324

Key words: chiropractic therapy, hyponatremia, malpractice, water intoxication

Introduction

Due to an excessive oral intake of fluids, water intoxication is recognized as a cause of symptomatic hyponatremia; the following complications, which often reveal fatal, characterize a wide variety of conditions, being reported in psychogenic polydipsia, endurance sports, medical activities such as bowel preparation for colonoscopy, uroflowmetry or urinary tract infections, MDMA ingestion, child abuse, hazing activities and military camps (1).

Acute hyponatremia – characterized by an onset of symptoms within 48 hours and Na⁺ levels < 134 mmol/L – is a medical emergency with a potentially fatal outcome,

thus explaining the need for a prompt diagnosis; the latter may not be always easy due to the unspecificity of many clinical signs and symptoms, including headache, nausea, asthenia, neurologic abnormalities, seizures, coma and, at last, death – this one frequently due to cerebral oedema. The most severe consequences of hyponatremia are related to the hydro-electrolytic imbalance, which requires an adequate therapeutic intervention (2).

For its benefits in patients with regular renal and endocrine system functions, a medium intake of 1,5–2 litres/day of water is commonly suggested in a medical setting; when the water intake exceeds its excretion, we talk about “water intoxication”, which represents a very infrequent condition (3).

The authors here report a rare case of a patient with severe acute hyponatremia due to an excessive voluntary water intake following a chiropractic prescription, further analysing its medico-legal implications.

Case Report

A 67-year-old woman, who had been suffering for a long time from low back pain due to the presence of herniated discs, decided to undergo a chiropractic treatment. According to the chiropractor prescription, the patient drank about 8 litres of water in a day. During the afternoon, she developed headache, nausea, vomiting and fatigue, for which reason she consulted the chiropractor, who reassured the patient and suggested to continue the treatment in order to purify the body. The next day, following the intake of other 6 litres of water, the patient developed sudden water retention, loss of consciousness and tonic-clonic seizures; for this reason, she was admitted to the Intensive Care Unit with a coma diagnosis from electrolyte alterations. The patient was admitted in a soporous state, aphasic (Glasgow Coma Scale = 6), with vital parameters in range (blood pressure 130/80 mmHg, heart rate 85 beats/min, SpO₂ 99%); the laboratory tests showed severe hyponatremia (104 mmol/L), which

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was considered to be the main cause of the coma and other neurological abnormalities. The diagnosis of water intoxication was stated based on the anamnestic data reported by the family members; according to the clinical findings, the hydro-electrolytic alterations were adequately corrected, allowing the disease resolution. Once resolved the intoxication, the patient underwent surgery to treat a shoulder dislocation and a humerus fracture which occurred due to a fall consequent to the tonic-clonic seizures. The Judicial Authority thus ordered a medico-legal evaluation of the chiropractor behaviour in order to identify any professional liability issue.

Discussion

Water intoxication represents a dangerous syndrome, frequently occurring in those conditions in which a subject is not aware of drinking too much, such as psychiatric disorders, endurance sports, drug abuse and particular cases of infant abuse.

Within a clinical setting, water intoxication cases are mostly described as consequence of the absence of an adequate control of several practices, such as bowel preparation for colonoscopy or urinary flowmetry, thus highlighting the importance of instructing the patients, especially older women, about either the related risks and an appropriate assumption of salts and proteins (1). Other authors have also stressed the importance of the collection of a clear and complete medical history of the patients, along with adequate monitoring, prompt investigation and correction of electrolyte imbalances in cases of medical procedures involving a massive water intake (1).

Risks are higher in infants (4), children and older people in relation, respectively, to immaturity and inefficiency of the urinary system. Symptoms of water intoxication due to severe dilutional hyponatremia include unspecific signs such as vertigo, nausea, vomit, loss of appetite, disorientation, seizures and coma (5); severe cerebral oedema can occur when acute hyponatremia develops in 48 hours or less. The leading causes of morbidity and mortality are brainstem herniation and mechanical pressure on the midbrain (5). To the best of our knowledge, except for the present work, any case is reported in literature concerning water intoxication following chiropractic practices (6).

D. D. Palmer defined chiropractic as “a science of healing without drugs” (7). Chiropractic care is one of the most widely used non-medicated therapies, known as Complementary and Alternative Medicine (CAM) (8). The purpose of chiropractic is to identify biomechanical dysfunctions, mainly in the vertebral column, and re-establish them by means of precise manipulations. Although it is described as a safe practice which doesn't make use of drugs, usually associated with transient adverse effects – including local or radiating pain, headache and tiredness, severe vascular accidents, such as cervical arterial dissection and stroke, have been described due to manipulations of the upper spine (9). In light of this, as well as other healthcare practitioners, also chiropractors can be involved in cases of professional liability (10-13).

The reported case is peculiar, since it shows the dangerous implications for the patients' health and safety deriving from the prescription of a large quantity of water intake, without any control by the chiropractor, and thus underestimating the risks of such a practice, as evidenced by the suggestion to continue the water intake aiming to detoxify the body from pharmacological substances. As a consequence, the patient developed a severe form of hyponatremia, leading to life-threatening complications that could have been otherwise avoided – namely, hydro-electrolytic imbalance, metabolic coma requiring hospitalization in an Intensive Care Unit, fractures due to seizures. Therefore, the medico-legal evaluation of the present case led to the admission of a professional liability of the chiropractor, who thus had to pay the damages to the patient.

The peculiar case here reported about the severe medico-legal implications of an excessive water intake prescription as a therapeutic practice, stresses the importance of adopting adequate control strategies – even for non-medical procedures and simple prescriptions – thus emphasizing the role of a careful approach in order to avoid either the transformation of a simple advice in the wrong prescription and to incur in malpractice issues.

References

1. Lee LC, Noronha M. When Plenty Is Too Much: Water Intoxication in a Patient with a Simple Urinary Tract Infection. *BMJ Case Rep* 2016;bcr2016216882
2. Spasovski G, Vanholder R, Allolio B, et al. Clinical Practice Guideline on Diagnosis and Treatment of Hyponatremia. *Eur J Endocrinol* 2014;170(3):41-47
3. Artunc F, Schnauder G, Gallwitz B, et al. Can Water Be Poisonous? *Dtsch Med Wochenschr* 2015;140(23):1761
4. Keating JP, Schears GJ, Dodge PR. Oral Water Intoxication in Infants. An American Epidemic. *Am J Dis Child* 1991;145:985-90
5. Chen JJ, Chang HF, Chen DL. Recurrent Episodic Vertigo Secondary to Hyponatremic Encephalopathy from Water Intoxication. *Neurosciences (Riyadh)* 2014;19(4):328-30
6. Radojevic N, Bjelogrić B, Aleksić V, et al. Forensic Aspects of Water Intoxication: Four Case Reports and Review of Relevant Literature. *Forensic Sci Int* 2015;220 (1-3):1-5
7. Palmer DD. The Chiropractic. *Palmer College Archives*, Davenport, IA 1897; Jan:1
8. Complementary, Alternative, or Integrative Health: What's in a Name? NCCIH 2018. <https://nccih.nih.gov/health/integrative-health>
9. Ernst E. Chiropractic: A Critical Evaluation. *J Pain Symptom Manage* 2008; 35(5):544-62
10. Jahn WT, Cupon LN, Perle SM. Guidelines of Conduct in Forensic Practice. *J Chiropr Med* 2004; 3(2):63-5
11. Ventura Spagnolo E, Mondello C, Cardia L, et al. Odontogenic abscess complicated by descending necrotizing mediastinitis: evidence of medical and dental malpractice. *Minerva Stomatol.* 2016; 65(6):412-415
12. Pastorini A, Karaboue M, Di Luca A, et al. Medico-legal aspects of tort law patient safeguards within the Gelli-Bianco piece of legislation. *Clin Ter.* 2018; 169(4):e170-e177

13. Baldino G, Argo A, Stassi C, et al. Are there positive lessons for Italy's NHS resulting from the Covid-19 pandemic? *Med Leg J.* 2020; 88(2):84-86
14. Gualniera P, Mondello C, Scurria S, et al. Experience of an Italian Hospital Claims Management Committee: A tool for extrajudicial litigations resolution. *Leg Med (Tokyo).* 2020; 42:101657
15. Rinaldi R. The Italian Supreme Court Joint Sections set forth the interpretative underpinnings of the "Gelli-Bianco" law: varying degrees of guilt aimed at limiting medical liability, article 2236 c.c. makes a comeback. *Clin Ter.* 2020;171(2):e101-e106