

Salt craving syndrome lead to hypertensive urgencies and rapid progression to end stage renal disease in destombes-rosai-dorfman disease: a case report and review of literature

Abstract

Many Dietary products over the human history have been considered a modifiable risk factor for causing Acute Kidney Injury (AKI) or progression of Chronic Kidney Disease (CKD). Salt is a highly addictive taste. Our brains and bodies are designed to enjoy salt because it is necessary for survival. Over the course of human history, finding salt was difficult, so craving salt was a survival mechanism. The American Heart Association recommends that adults consume between 1.5-2.4 grams (gm) of salt per day. That is no more than one teaspoon of salt per day. Most people take in close to 3.4 gm each day. However, craving salt may be a symptom of a health condition, and not just a yearning for a mid-afternoon snack. Salt craving syndrome can lead to complex medical situations, including uncontrolled hypertension and progressive renal damage ending with end stage renal disease requiring lifelong renal replacement therapy. Destombes-Rosai-Dorfman disease or sinus histiocytosis is characterized by massive lymphadenopathy. It is a rare proliferation of cells similar to histiocytes found in some patients. It can be idiopathic or post infectious and can be resolved spontaneously with no guidelines for directed therapy. In here, we report a young female who developed a post-delivery depressive illness associated with salt craving of 2,250-3,000 gm of salt daily. She suffered uncontrolled hypertension, progressive salt and water retention, generalized lymphadenopathy, and inguinal lymph node biopsy revealed sinus histiocytosis. She suffered progressive renal damage that required haemodialysis therapy in two years. In conclusion, salt craving is not uncommon, especially in females, and is associated with unflavoured outcomes, and may lead to end stage kidney disease if not well diagnosed

Keywords: food craving, renal failure, CKD, hypertension

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Abbreviations: AKI, acute kidney injury; CKD, chronic kidney disease; CKDu, chronic kidney disease unknown

Introduction

The worldwide average salt consumption per individual per day is reaching around 10 gm/day, which is far beyond the recommended WHO and FDA by about 4 gm and may be more than the actual daily requirements 2.4 gm/day by more than 8 gm. Egyptians used salt for preservation of food and mummies, beginning around 2000 BC, the use of salt as a preservative, particularly for meats, was likely among the main reasons of excessive salt intake. In the 16th century, salt consumption reached 100 gm/day, especially in Sweden. In the 19th century, salt consumption reached 18 gm/day as salted fish became a dietary staple. The invention of mechanical refrigeration in the 19th century eased reliance on salt as a preservative, which probably played a role in reducing the average daily salt intake to its current levels.¹ Food craving is among the environmental hidden causes of progressive chronic kidney disease unknown (CKDu); it is a psychological pressing to consume a substance that is nutrient like: salt, sugar, chocolate, or any other food components.² It is usually overlapped with Pica, which is a psychological disorder manifested by an appetite for substances that are mainly non-nutritive, like ice (pagophagia); hair (trichophagia); paper (xylophagia);³ drywall or

paint; sharp objects (acuphagia);⁴ metal (metallophagia), stones (lithophagia), or soil (geophagia); glass (hyalophagia); feces (coprophagia); and chalk.⁵ Pica can also be found in birds eating feathers, and animals like cats and dogs.⁶

Pathophysiological mechanisms that lead to the understanding of cravings are still not fully explored. However, the majority of food cravings are found to be linked to a group of foods which may be related to their ingredients. If the active ingredients responsible for craving are known and isolated, craving can either be avoided or treated by alternative support. As an example, chocolate contains the neurotransmitter phenylethylamine, which is an important brain stimulant that regulates the release of endorphins. Endorphins give the sense of relaxation post-stress.⁷ Some alternatives to chocolate are exercise and sleep because they both stimulate the release of endorphins.⁷ Craving has been found to be more among women than men, due to menstrual cycle changes, and during pregnancy. The reason might be to replace nutrients lost during morning sickness, or as a reflection of hormonal disturbance.⁸ In 1965, Pierre-Paul Louis Lucien Destombes had reported in a manuscript, in French language, 4 cases suffered adenitis associated with hyperlipidaemia, which is considered the first description of the disease.⁹⁻¹¹ After four years, in 1969, Juan Rosai and Ronald Dorfman, who were both pathologists, published a manuscript describing sinus histiocytosis with massive

lymphadenopathy.^{9,12} Therefore, it is called “Destombes-Rosai-Dorfman disease”.¹⁰ The condition later known as “Rosai-Dorfman disease” as they were the first to document that the condition can affect extra nodal areas, and outside the region of the head and neck.

Case report

A Case Report of 36-year-old female patient known to be healthy. On presentation to our hospital one year ago, she had uncontrolled blood pressure and hypertensive urgency with blood pressure systolic 230 mmHg and diastolic 130 mmHg. After controlling blood pressure in the emergency department, it was found that her serum creatinine 2.4 mg/dl, HB 12 gm/dl, renal ultrasound revealed average size both kidneys with grade II echogenicity. Doppler renal vessels was done to rule out renal artery stenosis and revealed normal renal vessels. A chronic kidney disease of unknown aetiology (CKDu) was settled as a diagnosis. She had a history of post-delivery depressive illness and taking anti-depressant medications. Later, frequent presentations with uncontrolled blood pressure, which is well controlled in the hospital reaching systolic 120 mmHg, but uncontrolled when the patient is coming from home for a follow up visit. After re-assessment and detailed history from the family we discovered that the patient is

craving large amounts of fast salty food and even adds 2-3 tanks of salt (2-3 kg) to her food per day. She had pica during pregnancy to salt but continued thereafter in a progressive manner (salt craving syndrome), especially after knowing that her son suffered from autism. During her admissions, a generalized lymphadenopathy, including cervical, retrosternal, retroperitoneal, and inguinal lymphadenopathies were observed. Left inguinal lymph node true cut biopsy was taken and revealed lymphoid tissue with prominent sinus histiocytosis. She was fully investigated with CT survey and brain MRI to assess extra-nodal sinus histiocytosis and work up came negative. No additional therapy was needed for sinus histiocytosis. In one year, her GFR dropped from 25 ml/min to 7.6 ml/min (Figure 1) and her blood pressure has never been controlled, so she had many admissions to ER with hypertensive urgencies requiring IV anti-hypertensive medications to control her blood pressure (Figure 2). Renal ultrasound showed rapid change in parenchymal echogenicity from grade II to III in one year follow up (Figure 3). Later, she presented with refractory generalized anasarca and advanced progressive deterioration of renal function urgently haemodialysis was established. She is currently on regular haemodialysis, 3 sessions per week, and doing well, but she still craving for salt. Her family continue to monitor her daily intake of salt to be within the acceptable levels.

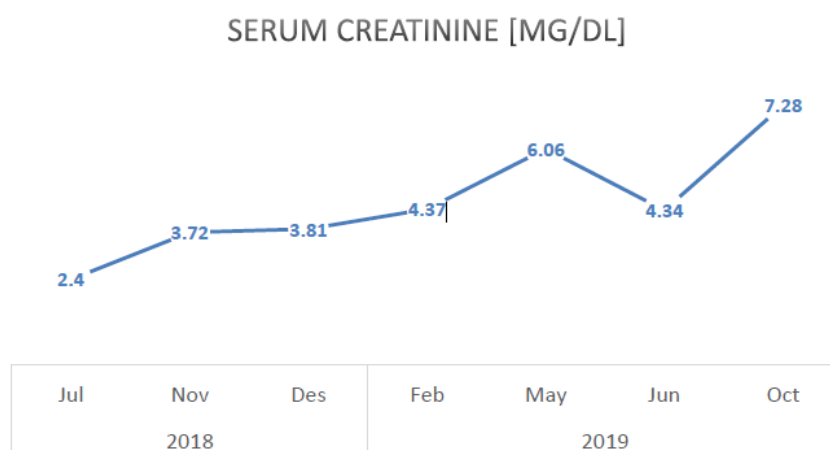


Figure 1A Serial serum creatinine [mg/dl].

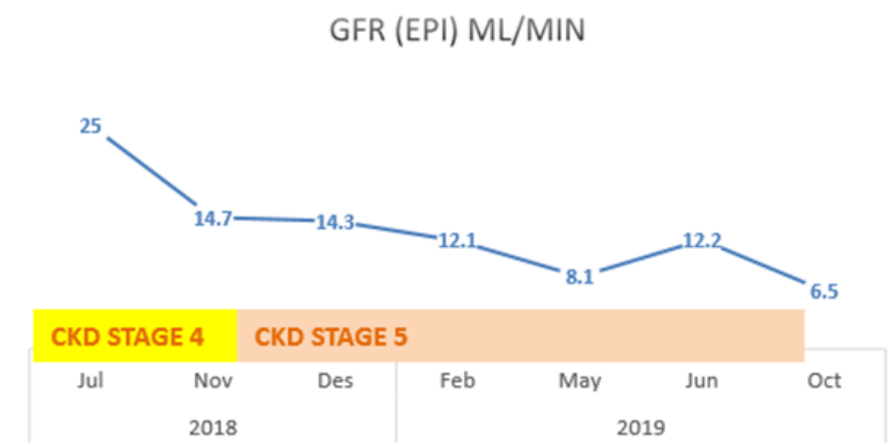


Figure 1B Serial eGFR [ml/min].

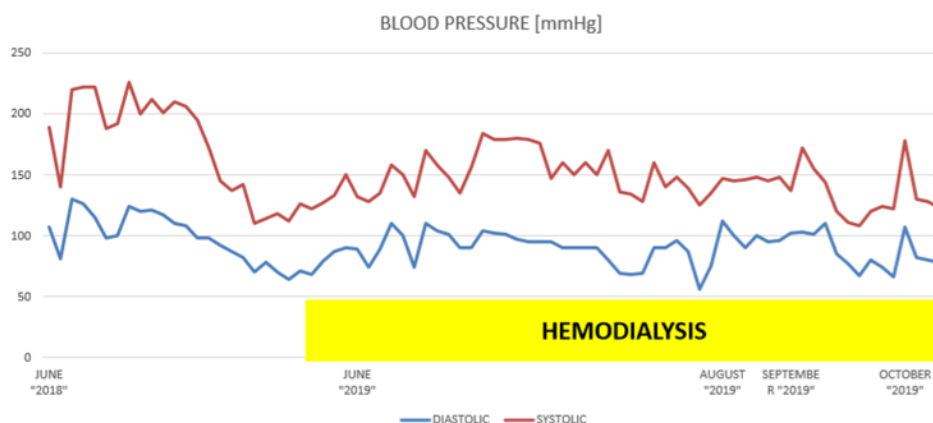
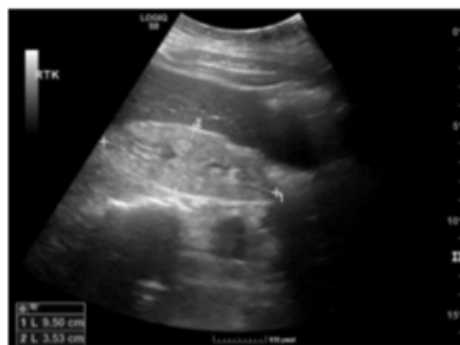


Figure 2 Uncontrolled blood pressure.

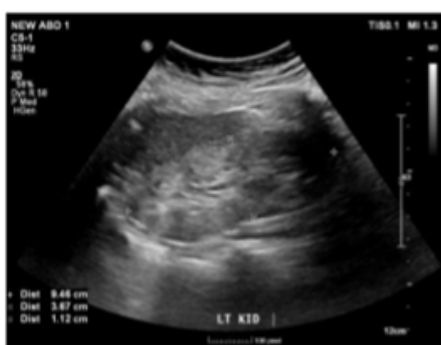
3.A) RIGHT KIDNEY, grade II echogenicity [2018].



3.B) RIGHT KIDNEY, grade III echogenicity [2019].



3.C) LEFT KIDNEY, grade II echogenicity [2018].



3.D) LEFT KIDNEY, grade III echogenicity [2019].

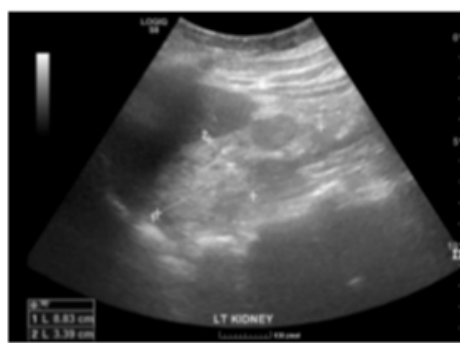


Figure 3 Sonographic progression of chronic kidney disease in one year.

Discussion

Endorphins, the happy hormones, may be the reason behind food cravings. Consumption of foods like fats, carbohydrates, and salt may be to correct low serotonin level and compensate the release of endorphins.¹³ Foods with high levels of carbohydrates, salt, and chocolate are higher on the list of craving than foods with lower

carbohydrates, or salt, e.g., broccoli, because those nutrients interact with opioid receptors in the brain and an addictive triggering effect occurs.¹⁴ The consumer feels the urge to consume more and more like an alcoholic because of the new conditioning of the brain to release “happy hormones” every time those nutrients are ingested.¹⁵ Pregnancy related craving is sometimes considered a social function rather than a nutritional one.⁸ In Thailand, a woman is considered

pregnant if she starts to crave sour foods after she misses the normal time for her menstrual period.¹⁶ Sometimes, it is a way to gain attention and help from the community towards their pregnancy and special need for care.¹⁷ Different cultures have different popular pregnancy cravings.¹⁸ The pregnant women are encouraged to follow and satisfy their cravings to avoid occurrence of anomalies in the babies later.¹⁹ It has different names according to the culture; it is called in the Arab world “Wahm”, in Malta “Xewqa” and in Philippines “Lih”.¹⁹ Morning sickness is another reason for craving. One of the treatments for morning sickness consists of accommodating food cravings and disinclination.²⁰ Our patient developed salt craving after delivery.

Craving in general has been observed in women, especially in the pre-menstrual period, more than men.^{21,22} Interestingly, mild cases of craving, particularly towards chocolate, can be treated by the smell of jasmine.²³ Pica is usually not associated with biological abnormalities. It is rarely associated with mineral deficiencies,²⁴ anaemia, and low plasma zinc levels.²⁵ Recently, cases of the psychiatric illness named obsessive-compulsive spectrum (OCD) and schizophrenia were found to be strongly associated with Pica, and even now, OCD is considered the cause of pica.²⁶ Pica is currently considered a mental disorder by the widely used Diagnostic and Statistical Manual of Mental Disorders (DSM-IV).²⁷ Pica is not always a psychiatric illness, and can sometimes be a cultural practice, e.g., ingestion of kaolin (white clay) among African-American women and in widespread parts of Africa.²⁸ This cultural practice has the health benefit of utilizing the clay’s ability to absorb, and protect against toxic alkaloids and tannic acids.²⁹ Experiments have been conducted to investigate the effect of depletion of sodium on the salt craving in rats.³⁰ When rats depleted from sodium multiple times using furosemide, they expressed a greater avidity for drinking 3% saline in comparison to water.

However, acute diuretic-induced urine loss was not enhanced by multiple sodium depletions with no change in the plasma sodium concentration and haematocrit with repeated furosemide treatments. In the end, it was found that multiple sodium depletions affected salt appetite and sodium intake. Although, this finding was found to be context and strain dependent.³¹ An important finding is that the memory of salt ingestion was driving those who have been exposed to multiple salt depletion to consume more salt even after stoppage of furosemide and normalization of sodium. The history of sodium depletion drives the animal to crave more salt even in the absence of stimulating force. It was found that increasing levels of aldosterone and angiotensin II sensitizes the rats’ salt appetite in a similar manner to that of rats with history of salt depletion.³⁰ Systemic block of aldosterone, and using angiotensin II blockers, e.g., spironolactone and captopril respectively inhibits salt appetite sensitization.³⁰ These data enrich our understanding of salt craving in humans that may be a reflection of either restoring sodium imbalance or may be indicative of a change in the sensitization of sodium appetite through dysregulation of the regulatory physiological mechanisms.

Currently, the WHO strongly recommends reducing dietary salt intake. A reduction in dietary salt from the current intake of 9-12 g/day to the recommended level of less than 5-6 g/day will have major beneficial effects on cardiovascular health along with major healthcare cost savings around the world. Reduction of salt is one of the top priority actions to tackle the global non-communicable disease crisis.³² Cases described with extra-nodal renal affection in Destombes-Rosai-Dorfman disease included renal mass,³³ and compression of ureters by enlarged retroperitoneal lymph nodes and membranous glomerulonephritis.³⁴ We believe that it was an association, as our case

had no renal masses or obstructive uropathy. However, our patient had significant proteinuria, which may be due to advanced renal disease, or may be related to destombes-Rosai-Dorfman disease. Renal biopsy was not feasible as both kidneys were small in size with grade III nephropathy at the time of diagnosis of sinus histiocytosis.

Conclusion

In conclusion, salt craving is not uncommon; it is a complex issue between cultural, social and biological needs. Efforts should focus on early, accurate diagnosis and management to prevent serious health consequences, like nephron loss and chronic kidney disease.

Acknowledgments

None.

Conflicts of interest

The author declares there is no conflict of interest.

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