Klüver Bucy syndrome, unusual consequence of excessively rapid correction of severe hyponatremia

Ewa Tuleja¹, Jean François Chermann², Carole Séréni², Gabrielle Hart², Daniel Séréni¹

1. Department of internal medicine, St. Louis Hospital, F-75010 Paris, France
2. Department of Neurology, Leopold Bellan Hospital, F-75014 Paris, France

Introduction > Features of Klüver-Bucy syndrome (KBS) include hypersexuality, hyperorality, placidity, visual agnosia, amnesia, hypermetamorphosis, and emotional and nutritional behavior changes. It is a clinical presentation of bitemporal disorders with limbic system abnormalities. The most common cause of KBS is herpes encephalitis.

Case description > An otherwise healthy 61-year-old woman presented with mental status changes (MMSE=0) after 6 days of severe vomiting. Extracellular dehydration, hyponatremia (107 mmol/L), low levels of natriuresis, and mild hypokalemia were noted. The initial computed tomography (CT) of the brain was normal. Over 36 hours of hospitalization in a district hospital she developed unusual neuropsychiatric disorders: hypersexuality, hyperorality, absence, visual agnosia, sensory aphasia, amnesia, and depression typical of KBS. She was then transferred to a neurology department. Clear improvement was visible 3 months later: MMSE-22, moderation of hypersexuality and hyperorality, partial correction of amnesia and aphasia, regression of visual agnosia. But the prosopagnosia (face blindness) persisted, and the patient remained unable to differentiate positive and negative facial expressions.

Discussion > Intracranial mass, epilepsy, neuromeningeal infection and head trauma were all ruled out. Antiepileptic and antitherpetic agents were tested without success. There was no evidence of...
disparition de l’agnosie visuelle. Malheureusement la prosopagnosie persistait, gravement invalidante, rendant impossible la distinction des mimiques exprimant les émotions positives ou négatives.

Discussion > Le bilan étiologique élimine un traumatisme crânien une tumeur intracrânienne, une épilepsie, une méningoencéphalite. Les épreuves thérapeutiques aux antipaléptiques et antihépétiques sont négatives. Il n’y a pas d’argument pour une insuffisance corticosurrénalienne, ni un SIADH. L’hyponatremie semble être consécutive directement aux vomissements prolongés et les lésions neurologiques à la correction trop rapide de l’hyponatremie. Initialement l’IRM visualise l’œdème bitemoral, qui évolue vers d’importantes lésions atrophiques bitemorales, de l’hippocampe et du système limbique sur le deuxième examen réalisé 3 mois plus tard. Contrairement à la myélinolyse centropontine, la destruction bitemorelle et limbique secondaire à une correction trop rapide de l’hyponatremie est exceptionnelle.

Clinical features of Klüver-Bucy syndrome (KBS) include hypersexuality, hyperorality, placidity, visual agnosia, amnesia, hypermetamorphosis, and emotional and nutritional behavior changes. They indicate bilateral temporal disorders with limbic system abnormalities. The most common cause of KBS is herpes encephalitis.

We report here a case of KBS that illustrates the risk of severe neuropsychiatric impairment from inappropriate treatment of hyponatremia caused by a common gastrointestinal disorder.

Case

An otherwise healthy 61-year-old woman was admitted to a district hospital with confusion and jargon aphasia that appeared after 6 days of severe vomiting and diarrhea. Her Mini-Mental State Examination (MMSE) score was 0. Persistent gastrointestinal losses were compensated by abundant water intake, which led to severe extracellular dehydration, hyponatremia, hyposmolarity, very low natriuresis, and mild hypokalemia. IV saline infusions corrected her serum sodium levels from 107 to 135 mmol/L during the first 36 hours of hospitalization. No syndrome of inappropriate secretion of antidiuretic hormone (SIADH) or adrenal insufficiency was found. Fluids were restricted and hydrocortisone supplementation (30 mg/day) given. When transferred to the neurology department, she remained confused and agitated, with several absence-like episodes. Administration of clonazepam for suspected subclinical epilepsy was ineffective. Electroencephalography demonstrated diffuse delta sequences predominating in the frontal regions. Computer tomography (CT) of the brain was normal, but magnetic resonance imaging (MRI) 2 weeks later revealed hyperintense (bright) signals in the right posterior temporal cortex figure 1. Repeated cerebrospinal fluid analysis ruled out infection, and IV administration of acyclovir was unsuccessful. Vitamin B1, B6 and nicotinamide supplementation was provided. Despite normalization of natremia, temporospatial disorientation continued (MMSE = 11), with distractibility, sexual disinhibition, sensory aphasia, hyperphagia, massive amnesia, and visual agnosia. She presented “psychic blindness”, that is, she was unable to identify the emotional significance of visual objects. In addition, she could not recognize either faces (prosopagnosia) or the facial appearance of negative emotions, such as aggression and fear. This impairment reflects bilateral damage to the amygdalae, which are involved in the recognition of facial expression of emotions [1]. This cluster of signs is consistent with the Klüver Bucy Syndrome (KBS).

Hyponatremia (125 mmol/L) recurred during the eighth week, but repeated investigations for SIADH, viral encephalitis, and adrenal insufficiency remained negative. The recurrence may have been related to the hyperorality associated with KBS or with carbamazepine administration and was easily corrected with fluid restriction and interruption of the medication. Three months later, MRI revealed large bilateral temporal lesions, both internal and external, as well as hippocampal atrophy. Partial KBS persisted with moderate hypersexuality (the patient making inappropriate advances towards nursing staff), hyperorality, placidity, and sensory aphasia. Although visual agnosia regressed completely, the Korsakoff-like amnesia persisted.

Discussion

Described for the first time in 1939 in monkeys after bitemporal lobectomy [2], KBS is considered a classic clinical manifestation of bilateral temporal disorder. The disruption of pathways connecting the dorsomedial thalami with the prefrontal cortices and other limbic areas is responsible for such neuropsychiatric disorders as hypersexuality, hyperorality, placidity, visual...
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damage, neurodegenerative diseases involving medial temporal lobe structures, brain tumors, posttraumatic encephalopathy, anoxia, and subarachnoid hemorrhage.

To our knowledge, only one case of adult KBS following correction of hyponatremia has been published [3]: in that case, the hyponatremia was associated with chemotherapy. Persisting vomiting in chronic alcohol intoxication or hyperemesis gravidarum is a well-known cause of Gayet-Wernicke’s encephalopathy and Korsakoff’s syndrome [4]. No case of KBS has been described in these situations to our knowledge, but we found several reports of central pontine myelinolysis associated with Wernicke’s encephalopathy induced by hyperemesis gravidarum [5]. The mechanisms of metabolic brain damage in pregnancy are complex and depend mainly on thiamine deficiency, but also on hormonal changes, such as gestational thyrotoxicosis.

Our patient developed KBS including irreversible neuropsychiatric impairment, due to extrapontine myelinolysis [6], probably caused by rapid correction of a severe hyponatremia, exceeding the recommended 8–12 mmol/L/day. We looked for but did not find other causes of bilateral temporal disorders, such as herpetic or EBV-encephalitis, temporal epilepsy, carbon monoxide intoxication, or head trauma. The initial hyponatremia resulted from gastrointestinal sodium loss and water intoxication. SIADH was ruled out, but hypotension, nausea, hyponatremia, and high doses of metoclopramide, a potent stimulator of ADH secretion, may have played a role. The instability of the patient’s ADH/natremia loop is suggested by the recurrence of hyponatremia, when carbamazepine, another ADH stimulator, was introduced.

Conflicts of interest: none

References


Figure 1

T1-weighted coronal magnetic resonance image of the brain shows severe bilateral temporal atrophy predominating in the hippocampal area and hyperintense (bright) cortical signals.