I37 Sudden Death Caused by Hyponatremia Related to Psychogenic Polydipsia

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Learning Overview: After attending this presentation, attendees will understand that sudden death may occur as a result of Psychogenic Polydipsia (PPD), a condition associated with various psychiatric conditions, especially schizophrenia.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by highlighting two cases of sudden death occurring in schizophrenic patients, wherein autopsy findings disclosed abnormal vitreous electrolyte values consistent with low-salt/hyponatremia produced by PPD.

Sudden, unexpected death in the context of psychiatric illness is not rare. Common scenarios include suicides and accidental deaths related to substance abuse. Other scenarios include deaths related to concurrent medical conditions, such as heart disease, deaths from trauma, and deaths related to complications of therapy.

PPD represents a disorder characterized by the compulsive consumption of large amounts of water as a secondary effect of an underlying psychiatric illness. Importantly, there is no intent of self-harm, and there is no identifiable underlying organic explanation for the behavior, such as a hormonal imbalance. Patients with schizophrenia are at most risk for PPD. In severe cases, dilutional hyponatremia can occur, with subsequent brain edema, seizures, coma, and death. This report presents two cases of sudden unexpected death occurring in schizophrenic patients in which autopsy findings determined that the cause of death was related to PPD.

Case 1 involved a 48-year-old, mentally handicapped, schizophrenic man who was noted to be in distress while at his group home. Emergency Medical Services (EMS) personnel were summoned and found the man in asystole. All resuscitative efforts were to no avail. In addition to schizophrenia, the man suffered from grand mal epilepsy, renal insufficiency due to lithium damage, with a known medical history of PPD, for which he had been placed on fluid restriction. A medicolegal autopsy was performed, which disclosed a slightly enlarged and dilated heart, mild coronary artery atherosclerosis, but no other gross abnormalities. Microscopic examination and toxicology testing were non-contributory. Vitreous electrolyte measurement revealed a sodium of 78mEq/L (normal: 135mEq/L–155mEq/L) and a chloride of 58mEq/L (normal:105mEq/L–135mEq/L). The cause of death was ruled as: part I–seizure disorder; part II–PPD due to schizophrenia. The manner of death was considered natural.

Case 2 was that of a 47-year-old man who was found dead in his bed. He had a known past medical history of schizophrenia and obesity. A medicolegal autopsy was performed, at which he was noted to have marked cardiomegaly (heart weight of 640 grams; normal <400 grams), as well as mild coronary artery atherosclerosis. Microscopic examination confirmed the myocardial hypertrophy but disclosed no other significant findings. Urine and drug screens were negative for drugs of abuse. Vitreous electrolyte testing revealed a sodium level of 85mEq/L and a chloride level of 110mEq/L. The cause of death was ruled as: part I–hyponatremia due to PPD related to schizophrenia; part II–cardiomegaly and atherosclerotic cardiovascular disease. The manner of death was natural.

Although PPD is most common in schizophrenic patients, it may also affect patients with other psychiatric disorders, including mood disorders and substance use disorder.[1] The exact mechanisms underlying the development of PPD are not known. However, psychiatric medications are not generally considered to contribute significantly, as there are known cases of PPD occurring prior to the use of currently prescribed psychotropic medications.[2] Patients with PPD are at increased risk of morbidity and mortality. The cases presented serve to remind the medical and psychiatric communities that PPD is a potentially lethal manifestation of psychiatric illness.

Reference(s):

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2. deLeon J., Verghese C., Tracy J.I., Josiassen R.C., Simpson G.M. Polydipsia and Water Intoxication in Psychiatric Patients: A Review of the Epidemiological Literature. *Biol Psychiatry*. 1994;35:408-19.

Psychogenic Polydipsia, Hyponatremia, Sudden Death