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# Adrenal Crisis in a Patient with Addison's Disease: A Case Report and Review of the Condition in Our Part of the Country, Nepal

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**Abstract**:

Addison's disease, also known as Primary Adrenal Insufficiency, is a rare endocrine disorder characterized by inadequate production of cortisol, aldosterone, and androgen by the adrenal glands. Adrenal crisis, a life-threatening complication of Addison's disease, occurs when the body cannot produce sufficient glucocorticoids to meet physical or emotional stress. This case report presents a 60-year-old female with Addison's disease who developed adrenal crisis due to acute gastroenteritis. The patient presented with non-specific symptoms of nausea, vomiting, lethargy, and abdominal pain, which were initially attributed to gastroenteritis. However, further evaluation revealed hyponatremia, hyperkalemia, and anemia, leading to the diagnosis of adrenal crisis. The patient was managed with intravenous hydrocortisone, fluid resuscitation, and antibiotics, and recovered after two days of hospitalization. This case highlights the importance of prompt diagnosis and management of adrenal crisis, which can be precipitated by infections, including gastroenteritis. The report also reviews the different aspects of adrenal crisis and Addison's disease in our part of the country, emphasizing the need for increased awareness, education, and preventive measures to reduce morbidity and mortality associated with these conditions.

**Keywords**: Adrenal Crisis; Addison's Disease; Primary Adrenal Insufficiency.



## INTRODUCTION

Addison's disease also known as Primary Adrenal Insufficiency (PAI) was first recognized by a British surgeon, Dr Thomas Addison who described symptoms of adrenocortical insufficiency and changes in the adrenal glands [1][2]. The damage to the adrenal glands leading to inadequate amounts of cortisol, aldosterone and androgen production leads to Addisons's disease [3]. The prevalence of Addison's disease is 120-140 cases per million. Among them 80% of PAI is caused by autoimmune adrenalitis followed by tuberculosis and other infections, malignancy, adrenalectomy, genetic diseases and adrenal hemorrhage [1-2]. Addison's disease presents as chronic fatigue, vomiting, weight loss, anorexia, hypotension, hyponatremia, hyperkalemia, hypoglycemia and generalized intraoral and extraoral skin pigmentation (bronzing of skin) [3]. Patients with addison's disease can present with addisonian crisis with infective pathologies [1]. Adrenal crisis can be described as acute adrenal insufficiency caused by insufficient production and a medical emergency requiring prompt diagnosis and management with glucocorticoids. It occurs due to insufficient glucocorticoid to meet the physical or emotional stress [5]. Adrenal crisis can be distinguished by several nonspecific symptoms such as hypotension, hypovolemia, diarrhea, vomiting, abdominal pain,

severe fatigue and hypoglycemia [4]. In this case report we present a case of Adrenal crisis due to acute gastroenteritis in a known case of Addison's disease. Also, we aim to present the different aspects of adrenal crisis and Addison's disease in our part of the country.

## CASE PRESENTATION

A 60-year-old female presented with complaints of loose stool about nine episodes, watery in consistency, non-bloody, associated with vomiting for 6 episodes in 24 hours. The vomitus was non bile stained, non projectile containing food particles not mixed with blood. She also complained of dizziness, lethargy, myalgia, mild abdominal pain and decreased urine output. She had no history of fever, loss of consciousness, yellowish discoloration of eyes, abdominal distention, cough, shortness of breath, chest pain. On clinical examination, the patient was thin built, ill looking and oriented to time, place and person. On vitals, pulse was 110 beats per minute, blood pressure 90/60 mmHg, temperature 97.2 F, oxygen saturation of 95% in room air. She had sunken eyes, dry mucus membrane with decreased urine output. Abdomen was soft with mild generalized tenderness to palpation with hyperactive bowel sounds on auscultation. Laboratory investigation revealed anemia with hemoglobin of 9.18 g/dl, lymphocytes 16.3%, normal red blood cell morphology and blood sugar of 76.8 mg/dl. In her metabolic profile, she had hyponatremia with serum sodium level of 132 mg/dl and potassium level of 4.8 mg/dl with normal urea, creatinine and serum cortisol level 0.1 mcg/dl. Her stool examination showed cysts of entamoeba histolytica and urine examination showed pus cells of 15-20. Based on the patient's history, clinical examination and laboratory parameters she was diagnosed to have adrenal insufficiency with acute gastroenteritis. She was managed with intravenous hydrocortisone, parenteral fluids, antibiotics and glucose during her Addisonian crisis. She recovered after two days of hospitalization and was discharged on oral prednisolone, metronidazole, cefixime and probiotics.

## DISCUSSION

Adrenal crisis presents as a medical emergency with hypotension and circulatory failure with glucocorticoid being the major contributor and aldosterone with minor role. Adrenal crisis presents suddenly in a patient with a known case of Addison's disease having intercurrent illness. The predominant symptom is shock while other nonspecific symptoms being anorexia, nausea, vomiting, weakness and fatigue [5]. Infections are the second most common cause of adrenal insufficiency (17-24%) where gastroenteritis and sepsis were among the top two triggers. Furthermore, Hahner et al. in their study also pointed out gastrointestinal infections and fever as the common precipitating factors [5]. In our study, the patient presented with non-specific symptoms of nausea, vomiting, lethargy and abdominal pain pointing towards adrenal crisis but initially these symptoms have been caused by acute gastroenteritis. The patient has hyponatremia with hyperkalemia on serum biochemistry and anemia on blood investigations. The patient was hypotensive on presentation. We initially provided the patient with intravenous hydrocortisone followed by fluid resuscitation with 0.9% normal saline with optimal glucose monitoring in the emergency department as suggested in various treatment guidelines where steroid, intravenous fluid and glycemic control are the mainstay of treatment [7-8].

The conventional immediate release hydrocortisone is the treatment of choice whereas newer dual and modified release hydrocortisone can now be alternative to prevent from the detrimental effects to circadian rhythm [8]. The patient was then admitted to the inpatient unit with additional antibiotics with metronidazole, cefixime along with probiotics. Acute gastroenteritis can lead to adrenal insufficiency because it disturbs the glucocorticoid absorption by diarrhea and vomiting [4].

Our patient was also on maintenance steroid therapy and multiple episodes of diarrhea with vomiting. Poor absorption along with increased stress during these episodes may have increased the need for steroids and hence our maintenance dose may have been inadequate in acute gastroenteritis. While treating the adrenal crisis, the age must be considered an important factor as the patients are more likely to have various health problems and underlying comorbidities. The older patients, specifically 58 years and old as suggested by a retrospective study by Ono et al. were affected in majority [4-5]. Moreover, they do not present typically with systemic signs such as fever which may cause delay in self-management and management by attending physicians [4]. Our patient also falls in the age group 60 and above and hence being vigilant in managing these patients can help prevent morbidity and mortality [4]. Duration of hospitalization with recovery was two days in our patient. The prompt diagnosis and treatment of the condition with the fear of the patient already being in adrenal crisis might have helped in the management. As both the symptoms of the crisis and acute gastroenteritis including nausea and vomiting overlap with each other [4]. Prevention of adrenal crisis is another important factor to prevent mortality and morbidity. There is an incidence of 6-8/100 patients per year with a mortality rate of 0.5/100 [1, 9-10]. Patients must be encouraged to have a band or specific card that could provide information of the condition which

could assist the physician in management [11][12]. The patient must be educated about the signs and symptoms of adrenal crisis for early recognition and prompt management. In the prompt management technique self-administration of glucocorticoid is one of the important aspects [13]. We in this part of our country are still struggling to incorporate these preventive measures which is an important aspect in reducing morbidity and mortality.

## CONCLUSION

Adrenal crisis is a life-threatening condition having higher morbidity and mortality rates with infection being one of the common causes. Being proactive and taking into account all the symptoms, clinical examinations and laboratory findings and training young medical officers on adrenal crisis would definitely help us to prevent the mortality and morbidity associated with it. Furthermore, the importance of the preventive aspects must also be considered while treating patients with adrenal crisis.

## ADDITIONAL INFORMATION AND DECLARATIONS

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**Consent for publication:** Informed consent was obtained from the patient for publication.

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