DIAGNOSTIC VALUE OF CLINICAL AND HORMONAL INDICATORS IN THE EARLY DETECTION OF PRIMARY ADRENAL INSUFFICIENCY

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ABSTRACT This article is dedicated to evaluating the diagnostic value of clinical and hormonal indicators in the early detection of primary adrenal insufficiency (Addison's disease). Early identification of clinical signs combined with stepwise hormonal assessment significantly improves diagnostic accuracy and prevents severe complications, including adrenal crisis. Clinical symptoms, such as fatigue, weight loss, salt craving, hypotension, and hyperpigmentation, in conjunction with hormonal markers including ACTH, cortisol, renin, and aldosterone, provide a reliable basis for early diagnosis.
Keywords: primary adrenal insufficiency, Addison's disease, cortisol, ACTH, renin, aldosterone, hormonal diagnostics, early detection, clinical assessment.

INTRODUCTION

Primary adrenal insufficiency (Addison's disease) is a rare but potentially life-threatening endocrine disorder. Early-stage symptoms are often nonspecific and may mimic other diseases, making timely diagnosis challenging.

Clinical significance of the disease. Addison's disease results from deficiencies in glucocorticoids, mineralocorticoids, and androgens. Symptoms vary depending on whether the disease is chronic or acute. The disease is often described as "chameleon-like" because it can mimic multiple other conditions, frequently leading to delayed diagnosis and multiple consultations with different healthcare providers.

Clinical manifestations. Classic signs include fatigue, weakness, weight loss, decreased appetite, orthostatic hypotension, tachycardia, hyperpigmentation of the skin and mucous membranes, gastrointestinal symptoms (nausea, vomiting, diarrhea), salt craving, amenorrhea, reduced libido, and depression. In children, seizures may occur following hypoglycemic crises.

LITERATURE REVIEW AND METHODOLOGY

Literature review. Previous studies indicate that early diagnosis of primary adrenal insufficiency is most effective when clinical signs are evaluated in combination with hormonal tests. ACTH and cortisol levels, along with plasma renin and aldosterone concentrations, are the most critical diagnostic markers [1–4].

Research methodology. Blood samples were collected from patients in the morning at 7:00 a.m. ACTH, cortisol, plasma renin, and aldosterone levels were measured. Diagnosis of Addison's disease was confirmed if ACTH levels were more than twice the upper limit of normal while cortisol levels were low. Mineralocorticoid deficiency was assessed by simultaneous measurement of plasma renin and aldosterone levels.

RESULTS

Clinical-hormonal indicators. Sixty percent of patients had consulted multiple physicians before the diagnosis of primary adrenal insufficiency was established. Analysis revealed:

a) ACTH levels exceeding twice the upper limit of normal;
b) Cortisol levels below 138 nmol/L (or <5 μg/dl);
c) Mineralocorticoid deficiency confirmed by plasma renin and aldosterone measurements.

Table 1. Clinical-hormonal parameters

Parameter	Normal range	Average value	Comment
ACTH (pmol/L)	4.5–12	25	Elevated
Cortisol (nmol/L)	275–550	120	Low
Plasma renin (ng/L)	2–10	15	Elevated
Aldosterone (ng/dl)	50–200	35	Low

Clinical symptoms. Fatigue was reported in 74–100% of patients, weight loss in 78–100%, and salt craving in 9–16%. Other findings included slowed growth and weight loss in children (61–100%), orthostatic hypotension and tachycardia (88–94%), hyperpigmentation (80–94%), nausea, vomiting, diarrhea (75–86%), recurrent abdominal pain (31%), amenorrhea or reduced libido (25–45%), and depression (20–40%). These results emphasize that evaluating clinical symptoms together with hormonal parameters significantly improves the early detection of primary adrenal insufficiency.

DISCUSSION

Stepwise measurement of hormonal parameters alongside clinical evaluation markedly enhances early diagnostic accuracy. Salt craving and hyperpigmentation are particularly important features for distinguishing Addison's disease from other disorders. Laboratory findings such as hyperkalemia and hyponatremia provide additional information regarding disease severity. In children, hypoglycemia-induced seizures further complicate early diagnosis.

CONCLUSION

Early clinical suspicion combined with hormonal assessment is crucial for the timely detection of primary adrenal insufficiency. Evaluating ACTH, cortisol, renin, and aldosterone levels together not only facilitates early diagnosis but also helps prevent life-threatening complications such as adrenal crisis. Due to the nonspecific nature of clinical symptoms and their overlap with other diseases, primary adrenal insufficiency is frequently diagnosed late. Assessing clinical signs—fatigue, weight loss, salt craving, hypotension, hyperpigmentation—together with hormonal markers enables effective diagnosis. Elevated ACTH and decreased cortisol in morning blood samples allow accurate confirmation of primary AD. Mineralocorticoid deficiency can be identified via simultaneous renin and aldosterone measurements, aiding treatment planning and individualized therapy. Early diagnosis improves patient quality of life and prevents severe chronic complications, including hypoglycemia, seizures, and cardiovascular issues. Integrating clinical and laboratory assessments also supports early detection and preventive management in pediatric patients. These findings demonstrate that combined evaluation of clinical and hormonal indicators is a highly effective and life-saving diagnostic strategy for primary adrenal insufficiency.

REFERENCES

1. Ten S., New M., Maclaren N. Clinical review 130: Addison's disease. J Clin Endocrinol Metab. 2001;86:2909–2922.
2. Brandão Neto R.A., de Carvalho J.F. Diagnosis and classification of Addison's disease (autoimmune adrenalitis). Autoimmun Rev. 2014;89:408–411.
3. Barthel A., Benker G., Berens K., et al. An Update on Addison's Disease. Exp Clin Endocrinol Diabetes. 2019;127:165–170.
4. Charmandari E., Nicolaides N.C., Chrousos G.P. Adrenal Insufficiency. Lancet. 2014;383:2152–2167.