

## A Bulking Agent May Lead to Adrenal Insufficiency Crisis: A Case Report

Salma Ahi<sup>\*1</sup>, Majid Esmaeilzadeh<sup>\*2</sup>, Elham Kayvanpour<sup>2</sup>, Farbod Sedaghat-Hamedani<sup>2</sup>, and Seyed Hossein Samadanifard<sup>1</sup>

<sup>1</sup> Department of Internal Medicine, Rasoul Akram Hospital, Tehran University of Medical Science, Tehran, Iran

<sup>2</sup> Department of General, Visceral and Transplantation Surgery, University of Heidelberg, Heidelberg, Germany

Received: 17 Jan. 2011; Received in revised form: 21 May 2011; Accepted: 14 Jun. 2011

**Abstract-** Adrenal insufficiency is a life-threatening disorder which must be treated with glucocorticoid replacement and needs permanent dose adjustment during patient's different somatic situations. Insufficient glucocorticoid doses result in adrenal crisis and must be treated with intravenous hydrocortisone. The patient was known with Adrenal insufficiency and was treated optimally with fludrocortisone and prednisolone since seven years with no history of adrenal crisis. The patient was admitted with abdominal pain, weakness, fatigue and nausea developed 3-4 days after taking psyllium, a bulking agent, prescribed by a surgeon to diagnose anal fissure. Detailed medical history, physical examinations, laboratory and imaging examinations did not approve any other cause of adrenal crisis. Psyllium may interfere with gastrointestinal absorption of prednisolone and/or fludrocortisone and trigger acute adrenal crisis in patients with adrenal insufficiency.

© 2011 Tehran University of Medical Sciences. All rights reserved.

*Acta Medica Iranica*, 2011; 49(10): 688-689.

**Keywords:** Adrenal insufficiency; Psyllium; Hydrocortisone; Hormone replacement therapy

### Introduction

Life-long hormonal replacement therapy is necessary in endocrine pathologies leading to hormonal deficits. Adrenal insufficiency is a life-threatening disorder which may result from either primary adrenal failure or secondary adrenal disease due to impairments of the hypothalamic-pituitary axis (1,2). Once adrenal insufficiency is diagnosed, glucocorticoid replacement is initiated as the cornerstone of management of this disease (2,3). It is a lifelong therapy and many conditions may alter the glucocorticoid requirements which necessitate dose adjustment. As the acute adrenal crisis consists it becomes necessary to immediately administer intravenous hydrocortisone (3,4). We present a well-controlled case of known adrenal insufficiency which developed signs and symptoms of adrenal crisis following induction dose of Psyllium.

### Case Report

A 56- year-old woman, a known case of adrenal insufficiency and Hashimoto's thyroiditis leading to hypothyroidism was referred to our private clinic. The patient's chief complaints were abdominal pain, weakness, fatigue and nausea. She was taking 0.1 mg

fludrocortisone and 7.5 mg prednisolone for seven years without any adrenal crisis. According to the complexity of patient's signs and symptoms, we decided to admit her to the hospital for a complete work up. Two weeks before admission, the patient developed abdominal discomfort and anal pain that referred therefore to a surgeon who prescribed psyllium, a bulking agent, for the diagnosis of anal fissure. Three days after taking psyllium at the same time with her other medications she developed the mentioned symptoms. It is to mention that the patient was optimally treated with levothyroxine, prednisolone, and fludrocortisone which make it unlikely that her crisis was caused by having been treated insufficiently. She also took her last doses of medication regularly before her admission to the hospital.

Patient's vital signs were as follow: blood pressure 90/70 mmHg without any significant orthostatic changes, pulse rate 96/minute, respiratory rate 18/minute, and oral temperature 38.3°C. Physical examination showed no significant findings except generalized abdominal tenderness. Our laboratory work up including complete blood count, liver function tests, serum electrolytes, renal function tests and blood glucose did not show any abnormal results (Hb: 17.3 g/dl, Hct: 48.7%, Na: 143 mmol/L ,K:4.4 mmol/L). In

**Corresponding Author:** Majid Esmaeilzadeh

Department of General, Visceral and Transplantation Surgery, University of Heidelberg, Heidelberg, Germany  
Tel: +49 6221 5638168, Fax: +49 6221 567470, E-mail: majid\_esmaeilzadeh@med.uni-heidelberg.de

\* Both authors contribute equally to this work

addition, we sent a blood sample for measurement of serum hydrocortisone and ACTH taken from the patient at 8 a.m on the second day after his admission to the hospital. No abnormal findings were observed in ECG, abdominal ultrasonography and abdominal CT scanning. Emergency consultation with surgical, cardiological and gastroenterological services did not add any significant information to our findings.

As many of the signs and symptoms were compatible with adrenal crisis, despite receiving the usual dose of prednisolone and fludrocortisone and according to the fact that the level of patient's serum hydrocortisone would not be immediately reported by the laboratory, it was decided to administer the full dose of hydrocortisone (300 mg/day) for the possible diagnosis of adrenal crisis. Although it was not expected, the patient significantly responded to this treatment. All the signs and symptoms disappeared rapidly one hour after administration of the first dose of hydrocortisone. This confirmed the diagnosis of Addison's crisis and so the patient did not undergo any further work up. Laboratory report showed that the hydrocortisone level was 0.3 mg/dL (4.5-24 mg/dl) and ACTH was 650 (4.7-48.8). Psyllium was discontinued and the stress dose of corticosteroid was gradually tapered to the replacement dose in 4-5 days. The patient was discharged in a good condition. She has been under close follow up since discharge from the hospital. At the time of writing this case report (15 months after discharge from the hospital), she is visited monthly and is in optimal treatment with 7.5 mg prednisolone, 0.1 mg fludrocortisone, and levothyroxine.

## Discussion

This known case of adrenal insufficiency was under maintenance therapy with prednisolone, fludrocortisone, and levothyroxine for 7 years with no complications and no return of symptoms. The moderate increase of patient's temperature could be due to adrenal crisis and the resulting hemoconcentration as reported by Nieman *et al.* (5). We did not have any positive microbial culture from the patient's biological samples. Although the suppressed level of serum hydrocortisone could be attributed to the oral replacement therapy, very high level of ACTH makes this option unlikely. As no other predisposing cause for Addison's crisis, such as trauma,

infection, lack of drug compliance, etc. could be identified, it has been concluded that co-administration of psyllium, as a bulking agent, may have induced patient's signs and symptoms. Therefore, we hypothesize that psyllium may interfere with gastrointestinal absorption of prednisolone and/or fludrocortisone.

It has been known for several years that psyllium changes the absorption rate of medications such as warfarin, digitals, potassium-sparing diuretics, tetracycline, *etc.* (6,7) but, to our knowledge, there is no report of interaction of psyllium with prednisolone and/or fludrocortisone. So, administration of psyllium to patients with adrenal insufficiency should be performed with caution. Further studies are needed to reveal the mechanism(s) of this interaction. Accordingly, co-administration of psyllium with other steroid-based drugs such as estrogen and progesterone may interfere with their absorption and effects.

## Acknowledgements

We thank to Dr. A. Mehrabi who accompanied us in all stages of the article.

## References

1. Arlt W, Allolio B. Adrenal insufficiency. *Lancet* 2003;361(9372):1881-93.
2. Bornstein SR. Predisposing factors for adrenal insufficiency. *N Engl J Med* 2009;360(22):2328-39.
3. Lundy JB, Slane ML, Frizzi JD. Acute adrenal insufficiency after a single dose of etomidate. *J Intensive Care Med* 2007;22(2):111-7.
4. Hahner S, Arlt W, Allolio B. Adrenal crisis. Diagnostic and therapeutic management of acute adrenal cortex insufficiency. *Internist (Berl)* 2003;44(10):1243-52.
5. Nieman LK, Chanco Turner ML. Addison's disease. *Clin Dermatol* 2006;24(4):276-80.
6. Fugh-Berman A. Herb-drug interactions. *Lancet* 2000;355(9198):134-8.
7. Nordström M, Melander A, Robertsson E, Steen B. Influence of wheat bran and of a bulk-forming ispaghula cathartic on the bioavailability of digoxin in geriatric inpatients. *Drug Nutr Interact* 1987;5(2):67-9.