Journal of Clinical and Translational Endocrinology: Case Reports 6 (2017) 4–8

Contents lists available at ScienceDirect

Journal of Clinical and Translational Endocrinology: Case Reports

journal homepage: www.elsevier.com/locate/jecr

Exogenous Cushing's syndrome secondary to intermittent high dose oral prednisone for presumed asthma exacerbations in the setting of multiple emergency department visits

Sanjay Manubolu, MD, MPH *, Oguchi Nwosu, MD, FAAFP

Emory University School of Medicine, Atlanta, GA, 30322, USA

ARTICLE INFO

Article history:
Received 13 April 2017
Received in revised form
18 July 2017
Accepted 21 July 2017

Keywords:
Asthma
Cushing's syndrome
Prednisone

ABSTRACT

Glucocorticoid therapies are extensively used in a wide range of medical conditions including respiratory, allergic, inflammatory and autoimmune diseases. Inappropriate use of therapeutic doses of glucocorticoids can lead to many adverse effects including hypothalamic pituitary axis suppression and Cushing's syndrome. All forms of glucocorticoid delivery have the potential to cause Cushing's syndrome. Here we present a case of exogenous Cushing's syndrome resulting from recurrent use of intermittent high dose oral prednisone to treat asthma exacerbation in the emergency department. This case report highlights the importance of pharmacovigilance in emergency departments and ambulatory settings. The knowledge of pharmacokinetic properties, daily dosage, frequency and differences in individual steroid metabolism is crucial in preventing adverse effects related to excessive use of glucocorticoids.

1. Introduction

1.1. Epidemiology

There is little epidemiologic information about the incidence of Cushing's syndrome (CS). It is traditionally estimated to affect 10 to 15 people per million populations each year in the United States, which is the reason the Office of Rare Diseases of the National Institutes of Health (NIH) lists it as a "rare disease" [1]. Studies conducted in Italy, Spain and Denmark report that the annual incidence ranges from 0.7 to 2.4 per million populations each year and the female to male ratio is 3:1 [2]. Although the prevalence in the general population is reported to be a fraction of a percent, recent studies suggest a much higher prevalence among specific patient populations, such as patients with diabetes mellitus (particularly if poorly controlled), hypertension, and early-onset osteoporosis (particularly if associated with fractures) [3].

Cushing syndrome is the result of excessive glucocorticoids from either an endogenous or exogenous source. Endogenous CS is classified as ACTH dependent or ACTH-independent. ACTH-dependent CS leads to disruption of the normal secretory dynamics of the hypothalamic–pituitary–adrenal (HPA) axis (Fig. 1A), which in turn leads to excessive cortisol secretion. Classically, the most common form of endogenous CS is ACTH dependent and accounts for 80–85%. CS caused by an ACTH-secreting pituitary adenoma is known as Cushing disease (CD), and is thought to occur in 75–80% of those cases (Fig. 1B). A small percentage of cases of ACTH-dependent CS (15–20%) is the result of (non pituitary) ectopic ACTH secretion (EAS) or, more rarely (<1%), corticotrophin-releasing hormone by benign or malignant neoplasia's such as a neuroendocrine tumor (Fig. 1D). ACTH-independent CS accounts for 15–20% of endogenous CS in adults. Of these ACTH independent CS, 90% are adrenal tumors and 80% of these are benign while the remainder are adrenal carcinomas and adrenocortical hyperplasia that secrete excessive cortisol, causing suppression of ACTH (Fig. 1C) [1]. The routine use of imaging equipment has increased the identification of incidentally detected adrenal masses. A substantial percentage of incidentally detected adrenal tumors are hormonally active, supporting the notion that the percentage of patients with ACTH-independent CS is greater than commonly believed.

Exogenous (iatrogenic) CS, the most common form, is caused by excessive oral, intra-articular, topical, or inhaled corticosteroids used as anti-inflammatory or immunosuppressive treatments. The development of iatrogenic CS is dependent on dose and duration of steroid therapy. Because iatrogenic CS is medication dependent, the

* Corresponding author.
E-mail address: sanmanubo@gmail.com (S. Manubolu).

http://dx.doi.org/10.1016/j.jecr.2017.07.001
2214-6245/

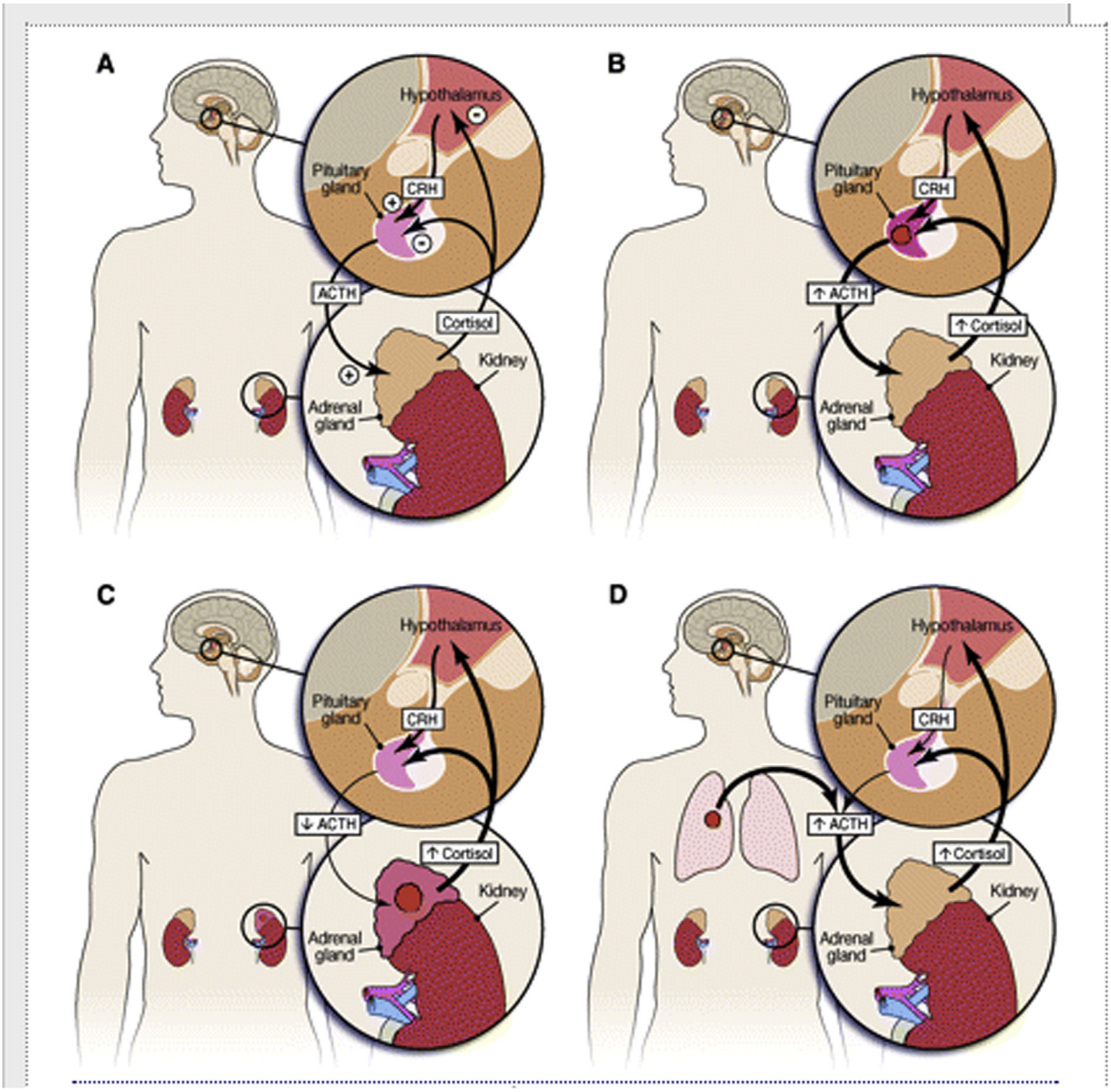

Fig. 1. Hypothalamus–pituitary–adrenal (HPA) axis differences between normal patients and patients with Cushing syndrome. A: Normal HPA axis. B: Adrenocorticotropic hormone (ACTH) dependent (Cushing disease). C: ACTH independent (Cushing syndrome). D: Ectopic ACTH syndrome. CRH, corticotropic-releasing hormone [4].

process to reverse the excessive cortisol exposure is accomplished by tapering the dose with the aim of discontinuing the medication, if possible.

Here we discuss a case of a 28-year-old obese woman with history of adult onset asthma who presented with difficulty breathing to the emergency department on multiple occasions due to lack of primary health care, and who was treated repeatedly with oral steroids and recommended to follow up with a primary care provider. There were multiple barriers for this patient to seek and obtain a primary care provider. We will focus this particular case discussion on her oral steroid use and subsequent development of CS due to lack of access to the appropriate follow up care by a primary care physician.

2. Case presentation

A 28-year old obese Caucasian female with history of adult onset asthma diagnosed one year ago presented to the emergency department with intermittent dyspnea for approximately two days. Her other symptoms included chest tightness and an impending sense of doom, as well as dry cough. There were no associated fever or chills. She also endorsed recent weight gain of 25–30 pounds in the past 2–3 months and intermittent headaches. She has normal menstrual cycles; about every 27 days and lasts for 4–5 days. She is not using any birth control methods and denies using any other medications. She had a past history of smoking, however she had quit smoking about 6 months prior to being diagnosed with asthma. She reports multiple emergency departments visits since the diagnosis of asthma. The patient had averaged two visits to the emergency department per month for the past five months due to dyspnea. She received a five-day course of prednisone each time she was evaluated in the emergency department; on most visits she was given 60 mg and on two occasions she was given 80 mg daily doses.