

## Falsely positive dexamethasone suppression test in a patient treated with phenytoin to prevent seizures due to nocardia brain abscesses

Johann Debrunner<sup>a</sup>, Christoph Schmid<sup>b</sup>,  
Markus Schneemann<sup>a</sup>

<sup>a</sup> Medical Clinic B, Department of Medicine, University Hospital, Zürich, Switzerland

<sup>b</sup> Division of Endocrinology, Department of Medicine, University Hospital, Zürich, Switzerland

Glucocorticoid excess is a strong risk factor for invasive infections with opportunistic microorganisms such as *Nocardia sp.* [1, 2]. A 78-year-old white male patient with systemic nocardiosis including brain abscesses was given phenytoin 3 × 100 mg daily per os as prophylaxis against epileptic seizures. We considered Cushing's syndrome as a potential disorder predisposing for nocardiosis and performed dexamethasone suppression tests (DSTs) and urinary cortisol measurements, thus using the two best established tools to screen for endogeneous glucocorticoid ex-

cess. These tests have estimated sensitivities and specificities of around 90% each (these rates depend on the patients referred for evaluation and the cutoff values used). Neither 1 mg, 2 mg, nor 8 × 2 mg of dexamethasone suppressed serum cortisol (fig. 1). Phenytoin was stopped, and 7 days later when we carried out the second set of DSTs, serum cortisol levels were suppressible by dexamethasone (figure). Since phenytoin is a potent inducer of the cytochrome P450 liver microsomal enzyme complex it accelerates hepatic inactivation of dexamethasone, which therefore is cleared more rapidly from the circulation and fails to reliably suppress ACTH and serum cortisol, resulting in a falsely positive screening test for Cushing's syndrome. Several reports from the 1970s and 1980s have described these interactions of phenytoin with the DST [3–6].

Despite impaired kidney function, our patient also had an elevated urinary cortisol excretion: 140 mg/24 h (normal, <120 mg/24 h) after initiation of treatment. Urinary cortisol excretion fell to 30 mg/24 h four weeks later when his infection was being controlled. ACTH and glucocorticoid production are markedly enhanced in patients with severe infectious diseases, particularly if the CNS is concerned. When phenytoin was discontinued and the DST repeated, cortisol levels were partially suppressed after one week.

Cushing's syndrome could be excluded definitively in a later 1 mg overnight DST

when serum-cortisol was adequately suppressed.

Correspondence:

Dr. med. Markus Schneemann

Department of Medicine

University Hospital

Rämistrasse 100

CH-8091 Zürich

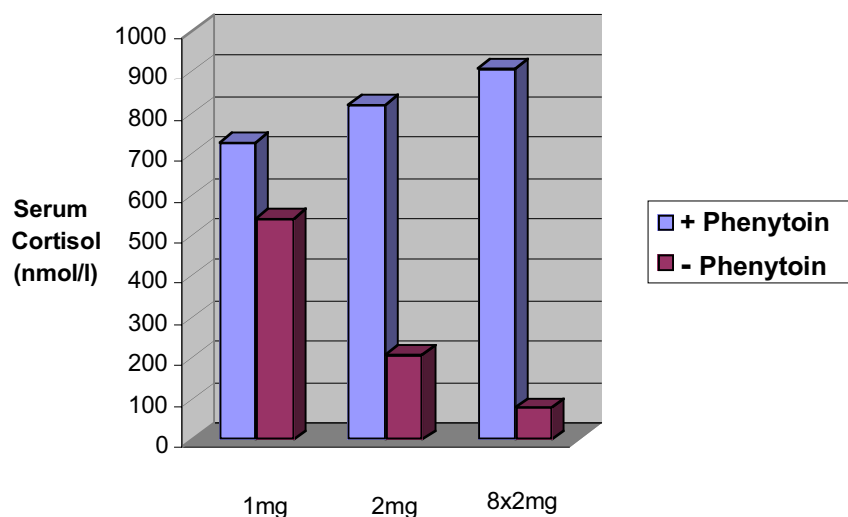
E-Mail: markus.schneemann@dim.usz.ch

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**Figure 1**

Dexamethasone suppression tests. Dexamethasone was administered at midnight at a dose of 1 mg, 2 mg, and at a dose of 8 × 2 mg within 2 days. Serum cortisol levels were measured 8 hours later. Even at 8 × 2 mg of dexamethasone, the serum cortisol was not inhibited when the patient was treated with phenytoin at a dosage of 3 × 100 mg per os.



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