

Mineralocorticoid effect of hydrocortisone – an important clinical problem

Magdalena Czarnecka-Operacz, Dorota Jenerowicz, Adriana Polańska, Anna Sadowska

Department of Dermatology, Poznan University of Medical Science, Poland
Head: Prof. Wojciech Silny MD, PhD

Post Dermatol Alergol 2011; XXVIII, 4: 328–329

Adverse drugs reactions are a highly complex clinical problem. The International Conference on Harmonization Requirements for Registration of Pharmaceuticals for Human Use (ICH) defines an adverse drug reaction regarding marketed medical product as “a response to a drug, which is noxious and unintended and which occurs at doses normally used for prophylaxis, diagnosis, or therapy of disease or for modification of physiological function” [1]. Adverse drug reactions include, among others, expected adverse reactions dependent on the pharmacological properties of a medical product, such as toxic symptoms, side effects, secondary or indirect symptoms (directly dependent on drug, associated with a particular disease) and drug interactions [2]. In Poland, safety of pharmacotherapy is monitored by the Department of Monitoring Adverse Medicinal Products cooperating with the WHO. To register and harmonize adverse drug reactions, the European Academy of Allergology and Clinical Immunology Interest Group on Drug Hypersensitivity and the European Network of Drug Allergy have developed a questionnaire whose Polish version was elaborated by researchers from the Department of Dermatology, Poznan Medical University [1, 3].

Glucocorticoids, which have been used for many years in dermatology, are the mainstay therapy of a wide range of dermatoses, both with an acute and chronic course. The mechanism of action of these drugs is omnidirectional, and their main therapeutic effect is associated with inflammatory and immunosuppressive properties [4]. Glucocorticoids, as is well known, are not without side effects, the severity and type of which depend on the dose and duration of therapy.

In cases requiring an immediate therapeutic effect (during hospitalization) commonly used steroids are water-soluble hydrocortisone hemisuccinate (*Hydrocortisonum hemisuccinatum*) and one of the strongest glucocorticoids, dexamethasone (*Dexamethasonum*). Regarding their side

effects, there is a close dependence on the chemical structure. In the case of dexamethasone the presence of fluorine in position 9 α enhances its anti-inflammatory properties (as compared to hydrocortisone for more than 25 times), and the addition of a methyl group (at position 16 α) minimizes its impact on electrolytes. A well-known fact is that mineralocorticoid properties may be observed during long and high-dose administration [5].

The purpose of this report is to present the growing phenomenon of hypokalaemia observed in patients treated at the Department of Dermatology, University of Medical Sciences in Poznań in 2008-2009, who received intravenous injection of hydrocortisone hemisuccinate (known under the trade name Corhydron). Our attention is drawn to the fact that in the case of a previously used series of hydrocortisone hemisuccinate preparation (*Hydrocortisonum hemisuccinatum*), despite the known action of mineralocorticoid properties, hypokalaemia was not observed or was recorded very rarely. Therefore, we retrospectively analysed 110 cases treated with Corhydron due to various dermatological indications. The average age in this group was 44.8 years. In 23% of cases (25 patients) after an average of 6.25 days of treatment with hydrocortisone at a mean dose of 200-400 mg/day, the mean value of hypokalaemia was 3.18 mmol/l (the lowest value 2.9 mmol/l), while the baseline mean value of potassium in patients' blood serum was 4.05 mmol/l. In 85 patients (77%) treated with similar doses of hydrocortisone for approximately 5.8 days, the measured mean values of potassium were within normal limits (4.19 mmol/l). Hypokalaemia occurred in the patients regardless of the oral and intravenous potassium supplementation, and often led to prolonged hospitalization. Normalization of potassium levels was observed in a short period after discontinuation of hydrocortisone.

Hypokalaemia observed in patients treated in our department strongly concerns the authors, and from our

Address for correspondence: Adriana Polańska MD, Department of Dermatology, Poznan University of Medical Science, 49 Przybyszewskiego, 60-355 Poznań, Poland, e-mail: adriana-polanska@wp.pl

point of view it seems to be important to inform about this type of predictable adverse reaction as well as to exchange experience between clinicians. Certainly, the presented phenomenon requires constant monitoring.

References

1. Jenerowicz D, Czarnecka-Operacz M, Silny W. Diagnostyka niepożądanych reakcji polekowych – modyfikacja kwestionariusza European Academy of Allergology and Clinical Immunology Interest Group on Drug Hypersensitivity and European Network of Drug Allergy. *Post Dermatol Alergol* 2005; 22: 112-8.
2. Czarnecka-Operacz M, Silny P. Osutki polekowe. *Alergia Astma Immunol* 2000; 5: 165-74.
3. Jenerowicz D, Czarnecka-Operacz M, Silny W. Diagnostyka nadwrażliwości na leki. In: *Skórne objawy nadwrażliwości na leki*. Jenerowicz D, Czarnecka-Operacz M, Silny W (ed.) Wydawnictwo Termedia, Poznań 2009; 31-71.
4. Silny W, Czarnecka-Operacz M, Gliński W, et al. Atopowe zapalenie skóry – współczesne poglądy na patomechanizm oraz metody postępowania diagnostyczno-leczniczego. Stanowisko grupy specjalistów Polskiego Towarzystwa Dermatologicznego. *Post Dermatol Alergol* 2010; 27: 365-83.
5. Langwiński R, Kleinrok Z. Hormony i witaminy. In: *Farmakologia*. Kostowski W, Herman Z (ed.) Wydawnictwo Lekarskie PZWL, Warszawa 2003; 333-6.