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Original article

## Long-term systemic glucocorticoid therapy: Patients' representations, prescribers' perceptions, and treatment adherence

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### ABSTRACT

**Introduction:** Glucocorticoids have been used since 1948 for their anti-inflammatory and structural effects in various inflammatory diseases. The optimal use of glucocorticoids remains controversial. Patients may have a number of concerns about the effects of glucocorticoids. Many factors can adversely affect treatment adherence.

**Objectives:** To evaluate the main adverse effects reported by patients and physicians, and to assess representations associated with glucocorticoid therapy and the underlying disease, via measurements of treatment adherence, with the goal of optimizing treatment strategies and improving patient information.

**Methods:** From December 2011 to May 2012, we conducted two surveys in 125 patients receiving long-term glucocorticoid therapy and followed-up at the rheumatology department of the teaching hospital in Casablanca, Morocco, and in 85 hospital physicians in various specialties, respectively.

**Results:** Mean glucocorticoid therapy duration was 6 years, mean maximal prescribed dosage was 44.87 mg/d, and 50.4% of the patients had inflammatory joint disease. Adverse neuropsychiatric effects were reported by 70 out of 125 (56%) patients. Weight gain was the adverse effect deemed most bothersome by the physicians, who significantly underestimated the occurrence of neuropsychiatric adverse effects (27% vs 56%,  $P=0.034$ ). Adherence was poor in 80 out of 125 (64%) patients, and 22 out of 125 (18%) patients reported episodes of treatment discontinuation.

**Conclusion:** Prescribers underestimate the frequency of neuropsychiatric adverse effects of long-term systemic glucocorticoid therapy. Regular follow-up visits during treatment, with collection of systemic adverse effects might improve treatment adherence.

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## 1. Introduction

Glucocorticoids take pride of place in the treatment of many diseases. The estimated prevalence of systemic glucocorticoid therapy prescribed for 3 months or more is 0.2% to 0.5% in the general population [1,2] and 1.7% in women older than 55 years of age [2]. Although the benefits of glucocorticoid therapy are well established, they come at the cost of frequent adverse effects (AEs) [3,4]. Both the occurrence of AEs and patient concerns about possible AEs can result in poor treatment adherence. Perceptions of AEs, particularly regarding their severity and consequences, may differ between patients and physicians.

We conducted surveys among patients and specialist physicians to identify the AEs they deemed most important. Our goal was to

improve patient information and, ultimately, treatment adherence based on an analysis of the survey results.

## 2. Methods

### 2.1. Study design

We conducted two cross-sectional surveys between December 2011 and May 2012. One survey included 125 consecutive outpatients or inpatients at the rheumatology department of the teaching hospital in Casablanca, Morocco. Inclusion criteria were age older than 18 years and oral glucocorticoid therapy for at least 1 month in a daily dosage of at least 5 mg. Patients were given bolus intravenous injections or intra-articular injections of glucocorticoids before the current oral glucocorticoid regimen were eligible. We did not include patients in whom poor general health precluded questionnaire completion or who had been taking oral glucocorticoid therapy for less than 1 month. The second survey included 85 specialist physicians who worked at the Casablanca

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teaching hospital in Morocco and who volunteered for the study.

## 2.2. Physician survey

A questionnaire was developed using phpESP survey software (<http://sourceforge.net/projects/phpesp/>) at the Biostatistics, Epidemiology, and Medical Informatics department of our hospital. The questionnaire has three sections, each with dichotomous and multiple-choice items. The first section collected information on the identity and specialty of the physician and specified the number of patients under the physician's care, taken as a marker of experience. The second section obtained details on prescription of long-term systemic glucocorticoid therapy by the physician. Finally, the third section collected the glucocorticoid-related AEs deemed most bothersome by the physicians, based on personal experience. The physician completed the questionnaire then, handed it to the investigator on-site.

## 2.3. Patient questionnaire

An anonymous questionnaire in French comprising both dichotomous and multiple-choice items was completed once by the investigator based on a patient interview. If needed, the investigator translated the items into Arabic and provided explanations about their meaning. The first section of the questionnaire collected information on social status, reason for glucocorticoid therapy, glucocorticoid therapy dosage and duration, and source of information on AEs. The second section evaluated treatment adherence based on glucocorticoid tapering regimens, adherence to adjuvant treatments (e.g. gastroprotective agents, vitamin D and calcium supplements, potassium supplements, and low sodium diet), adherence to follow-up visits, self-medication (defined as use by the patients of glucocorticoids obtained without a medical prescription), and failure to refill the prescription. The interviewer then asked the patient to mark the AEs he or she considered bothersome on a closed list of all possible AEs. Several response options were provided.

## 2.4. Data analysis

The investigator who participated in both surveys analyzed the data. Some of the results are described as mean  $\pm$  SD. Fisher's exact test was used to compare qualitative variables.

## 3. Results

The 85 physicians consisted of 16 (18.8%) rheumatologists, 15 dermatologists, 12 nephrologists, 10 gastroenterologists, eight interns, eight neurologists, six pulmonologists, five infectiologists, three oncologists, and two pediatricians. Table 1 reports details on the glucocorticoid treatments prescribed by these physicians. Table 2 shows the main characteristics of the 125 study patients. Among them, 66 (53%) patients adhered to the adjuvant treatments, including 52 who adhered to vitamin D and calcium supplementation, potassium supplementation, and gastroprotective treatment. Only 14 patients followed a low sodium diet. Adherence was poor in 64% of the patients (Table 3). Episodes of treatment discontinuation were reported by 22 patients and continuous glucocorticoid use without a medical prescription by 58 patients.

Table 4 reports the AEs deemed most bothersome and ascribed to glucocorticoid therapy by the patients, as well as the main AEs reported by the physicians based on their personal experience. The patients underestimated the complications considered common by the physicians whereas the physicians significantly underestimated the rate of neuropsychiatric AEs. Thus, neuropsychiatric

**Table 1**

Details on the glucocorticoid treatments prescribed by the 85 surveyed specialist physicians.

Modalities of glucocorticoid therapy prescribed by the respondents	Number (%) of physicians
Prescription of oral long-term glucocorticoid therapy expected to last $\geq$ 1 year	53 (62.3)
Prednisone	70 (82.3)
Starting dosage $\geq$ 20 mg/d	41 (48.2)
Diagnosis	
Connective tissue disease	34 (40)
Inflammatory joint disease	25 (29.5)
Other: cancer, extramembranous glomerulonephritis, vasculitis, sarcoidosis, inflammatory myositis	29 (34)

**Table 2**

Main characteristics of the 125 surveyed patients receiving long-term systemic glucocorticoid therapy.

Females	103 (82.4%)
Mean age in years	46.5 $\pm$ 10
Socioeconomic status	
Low	84 (67.2%)
Intermediate	28 (22.4%)
High	13 (10.4%)
Diagnosis	
Rheumatoid arthritis	63 (50.4%)
Systemic lupus erythematosus	22 (17.6%)
Other (sarcoidosis, dermatomyositis, vasculitis, scleroderma, overlap syndromes)	40 (32%)
Prednisone	98 (78.4%)
Number of patients on long-term systemic glucocorticoid therapy for $\geq$ 1 year	89 (71.2%)
Mean treatment duration in months	73.6
Number of patients with a prescribed dosage $\geq$ 20 mg/d for at least 2 months at any time	75 (60%)
Systemic lupus erythematosus and other diagnoses	62
Rheumatoid arthritis	13
Mean maximal dosage	44.9 mg/d
Mean current dosage	11.4 mg/d ( $n = 62$ )
Information on the diagnosis and treatment effects before treatment initiation	80% ( $n = 100$ )
By physicians	81 (64.8%)
Self-information	19 (15.2%)
No information	25 (20%)

symptoms were reported by 56% of the patients compared to only 27% of the physicians ( $P = 0.034$ ). The nine patients with depression had no detectable symptoms of depression at glucocorticoid initiation. Most of these patients had a low socioeconomic status

**Table 3**

Patient-reported reasons for non-adherence and self-medication.

Reasons for poor treatment adherence and self-medication	N <sup>o</sup> of patients, $n = 80$ (64%)
Intermittent treatment discontinuation	22
Severe adverse effects	9
Fear and reluctance toward glucocorticoids	7
No information	6
Continuous self-medication with glucocorticoids obtained without a medical prescription	58
Symptom relief	21
No information	15
Inadequate self-information	12
Follow-up visits deemed too widely spaced	11
Inexpensive drug/disease-modifying drug	6
Easy availability of glucocorticoids from pharmacists	5

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