Corticosteroid Nonprescription Use: A Cross-Sectional Hospital-Based Study in Basrah

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Key Words

Drugs · Self-prescription · Corticosteroids · Iraq

Abstract

Objective: To study the prevalence and attitude of using nonprescription corticosteroids (oral or parenteral formulation of glucocorticosteroids) in Basrah, Iraq. **Methods:** A face-to-face model structured interview was used to collect information from 682 patients between January 2006 and December 2008. The following information was obtained: age, gender, marital status, smoking, drinking of alcohol, occupation, educational level, social class and place of residence. **Results:** Of the 682 (2.6%) subjects using nonprescription corticosteroids most were females: 471 (69%); married: 567 (83%); of low social class: 430 (63.1%); lived in the city center: 475 (69.6%). The majority (569, 83.5%) thought that corticosteroid use was safe and 463 (68.0%) did not feel guilty for using such medications. About half of them (377, 55.3%) were still using drugs at the time of presentation. Three hundred and fifty-seven (52.4%) reported that physicians advised them for the first time to use corticosteroids and the remaining 325 (42.2%) used it to become beautiful or marry. Three hundred and sixty-four (53.4%) patients obtained the drug from the pharmacy and 252 (36.9%) from street vendors. Weight gain was the main indication for use in 342 (50.1%) patients. Almost all had some features of cor-

ticosteroid side effects. **Conclusion:** This study showed high use of nonprescription corticosteroid in Basrah, Iraq. We therefore recommend educational programs to alert the population of the untoward side effects of corticosteroids.

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Introduction

The Iraqi health system has a lot of problems [1] probably made worse by the United Nations economic sanctions against Iraq in 1990 [2–6]. Self-medication and the use of nonprescription drugs are common in developing countries [7–9].

Because in Iraq medications are not classified as prescription only or over-the-counter drugs, the general public has a wider access to different types of medications than would have been the case. Hence self-medication is a very common habit in Iraq and as such, drugs can be bought in the pharmacy or from street vendors since mid 1980 during the war with Iran and after the economic sanctions took effect in 1991.

The introduction of glucocorticoid therapy by Philip Hench in the 1950s revolutionized the treatment of rheumatic and inflammatory disease [10]. Because of its ‘magic effect’, it was used indiscriminately without prescription with resultant side effects, which can be very severe

even if used in low doses [11–14], as has been described in a review article of corticosteroid abuse and/or dependence driven by the euphoria these medications can induce [15].

In many industrialized countries there is a desire to lose weight through dieting or calorie restriction, use of diuretics, vomiting or exercise [16]. However, in many developing countries being fat is culturally acceptable and is associated with beauty, prosperity, health and prestige, and thinness is perceived to be a sign of ill health or poverty [17–19]. We therefore investigated the prevalence and attitude among people in Basrah, in using nonprescription corticosteroids (oral or parenteral formulations of glucocorticosteroid).

Patients and Methods

An observational, descriptive, cross-sectional study was conducted to estimate the prevalence, attitude and problems of using self-prescribed corticosteroids (oral or parenteral formulations of glucocorticosteroid) among patients attending the outpatient clinic at Al-Faiha Hospital, Basrah, Iraq. This hospital is one of the four major general hospitals in Basrah and as such receives 25% of outpatient visits from the city districts.

A face-to-face model structured interview over 3 years from January 2006 to December 2008 was used. Information on age, sex, marital status, smoking, drinking of alcohol, occupation, educational level, social class and place of residence was obtained by specially trained physicians. The interview was done only for those who had obvious features of corticosteroid side effects or those who admitted that they were using self-prescription corticosteroids whether or not there were any features of side effects. Subjects who smoked at least one cigarette per day or drank alcohol once during the year before the examination were classified as smokers or drinkers accordingly. Socioeconomic status, based on family income and educational level [20], was used to determine the patient's social class.

Inclusion criteria were: corticosteroid use without medical advice; continued use after short prescription regardless of the duration; patients who denied using corticosteroids, but had clinical features of hypercortisolism upon clinical examination. The name and type of corticosteroid were suggested by the patients according to formulation type and color in most of the cases. None of our patients gave the duration of steroid use exactly. Patients who were using prescribed corticosteroids regardless of the duration or side effects such as asthma, nephrotic syndrome, chronic immune thrombocytopenia, rheumatoid arthritis were excluded from the study.

The nonprescription corticosteroids included oral prednisolone, dexamethasone tablets, injection solution and syrup commonly combined with cyproheptadine. The injection solutions were methylprednisolone acetate, betamethasone acetate, triamcinolone acetate or a combination. Depot corticosteroid was used monthly while short-acting corticosteroid injections such as dexamethasone or betamethasone were used daily. A formulation widely used contained dexamethasone and antihistamine (hya-

nil). Some patients were reluctant to disclose the use of corticosteroid but did so when confronted with the physical signs of steroid side effects.

Body mass index (BMI) was calculated as body weight in kilograms divided by the squared value of body height in meters (kg/m^2). Three blood pressure measurements were obtained by physicians. The measurements were made with the patient in a sitting position after 5 min of rest. Hypertension was defined as self-reported use of antihypertensive medication within the past 2 weeks or an average blood pressure of ≥ 140 mm Hg, or an average diastolic blood pressure of ≥ 90 mm Hg, or both. Type 2 diabetes mellitus was diagnosed according to the American Diabetes Association criteria of fasting plasma glucose value ≥ 126 mg/dl (7 mmol/l) on two occasions or symptoms of diabetes and a casual plasma glucose ≥ 200 mg/dl (11.1 mmol/l) or history of diabetes [21].

The questions included knowledge of adverse effects of corticosteroids; guilty feeling for using nonprescription drugs; duration of use; on whose advice they first used corticosteroids; source of drug; any other first-degree family members using corticosteroids at any time previously. They were later asked why they were using corticosteroids. Then they were examined for any features of corticosteroid side effects. The features of side effects as published in the literature and fungal skin infections were dermatophytosis, candidiasis and pityriasis versicolor [10, 22].

Prescription drug misuse/abuse for the purpose of this study was defined as the use or illicit purchase of prescription corticosteroids by somebody for whom they were not prescribed, or where people used prescription corticosteroids in a way that they were not intended (e.g. for weight gain effects) or where such corticosteroids are sold on the illicit market.

Written informed consent was obtained from all subjects prior to enrollment. Patients' characteristics were reported as percentages or mean $\pm$ standard deviation (SD).

Results

Of 25,968 patients seen in the medical outpatient clinic over 3 years, 682 (2.6%) were using corticosteroids without prescriptions. Their mean age was 39.6 ± 14.1 years (range 15–96). Of the 682 patients, 471 (69%) were females, 567 (83%) were married (including divorcees and widows), 457 (67%) unemployed or housewives, 32 (4.6%) policemen, 7 (1%) paramedics, 90 (13.1%) smokers, 7 (1.0%) alcohol drinkers and 63.1% were from a low social class (table 1). The school achievement was 5.82 ± 5.1 years. Four hundred and seventy-five (69.6%) were from the city center (of whom 90% were from Heanea, Al-Hadi and Gezeasa, which are the poorest areas in Basrah). Mean BMI was 25.8 ± 5.8 kg/m^2 ; 415 (60.8%) were either overweight or obese ($\text{BMI} \geq 25$ kg/m^2).

Misbeliefs and attitudes towards the use of corticosteroids are presented in table 2. Five hundred and ninety-six (83.5%) thought that corticosteroid use was safe and

Table 1. Study sample characteristics (682 patients)

	n (%)
Gender	
Male	211 (30.9)
Female	471 (69.0)
Marital state	
Married ¹	567 (83.0)
Smokers	90 (13.1)
Alcohol drinkers	7 (1.0)
Occupation	
Employed	152 (22.2)
Teacher	19 (2.7)
Student	15 (2.1)
Policeman	32 (4.6)
Paramedic	7 (1.0)
Housewife ²	457 (67.0)
Qualification, years of school achievement	5.82 ± 5.1
Social class	
Low	430 (63.0)
Medium	244 (35.7)
High	6 (0.8)
Residency	
City center ³	475 (69.6)
Al-Zubair	60 (8.8)
Al-Midaina	24 (3.5)
Al-Qurna	39 (5.7)
Al-Faw	2 (0.3)
Outside	48 (7.0)
Shatt Al-Arab	19 (2.8)
Abu Al-Khaseeb	15 (2.2)
Mean weight ± SD, kg	69.8 ± 15.9
BMI, kg/m ²	
Mean ± SD	25.8 ± 5.8
<18.5	40 (5.8)
18.5 –<25	227 (33.2)
≥25	415 (60.8)

¹ Includes widowed, divorced.² Includes unemployed and retired.³ City center (90% from Heanea, Al-Hadi and Gezeasa).

463 (68.0%) did not feel guilty using such medications. Mean duration of use was 3.7 ± 3.5 years and 377 (55.3%) were still using the drug at the time of the study. Those who stopped using drugs usually did so suddenly without medical advice. The exact date of starting using self-prescription corticosteroids was difficult to ascertain, but most of them claimed that they did not use them before 1990.

Three hundred and fifty-seven (52.4%) patients claimed that they used corticosteroids for the first time based on advice of a physician, while 288 (42.2%) used

Table 2. Misbeliefs and attitudes towards the use of corticosteroids

	n (%)
Is steroid use safe?	
Yes	569 (83.5)
No	113 (16.5)
Do you feel guilty?	
Yes	219 (32.0)
No	463 (68.0)
Duration of use, years	3.7 ± 3.5
Stopped	
Yes	308 (45.2)
No	374 (54.8)
Who advised you to start corticosteroids?	
Doctor	357 (52.3)
Herself to become beautiful or marry	288 (42.2)
Spouse	19 (2.7)
Sister	12 (1.7)
Mother	6 (0.8)
Source of corticosteroids	
Pharmacy	364 (53.4)
Street vendors	251 (36.9)
Nursing staff	67 (9.7)
Family history of corticosteroid use ¹	256 (40)
Addiction of other drugs ²	4 (0.5)

¹ First-degree relatives.² All males.

them on themselves to become beautiful or marry. Three hundred and sixty-four (53.4%) obtained the drug from the pharmacy and 251 (36.9%) from street vendors. Two hundred and fifty-six (40%) had first-degree relatives who used corticosteroids and 7 (0.6%) concurrently used other drugs.

Self-reported indications of corticosteroid use are given in table 3. Weight gain was the main indication for use in 342 (50.1%), followed by asthma (144, 21.1%). In the weight gain group, dexamethasone was the commonest formulation used in 290 (84.8%), followed by oral prednisolone in 26 (7.6%). In the asthma group, prednisolone was most common in 74 (51.4%) and dexamethasone in 43 (29.9%), while in the allergy (nonspecific) group 67.1% were using dexamethasone and 52.2% of the joint pain group were using methylprednisolone acetate.

The main features of corticosteroid abuse are listed in table 4. Thin skin was seen almost always in all patients. Moon face, striae and malaise/fatigue were seen in 92.0, 51.4 and 48.3%, respectively. Buffalo hump, central obesity, and supraclavicular fat pad were seen in 46.4, 45.4

Table 3. Self-reported indication of corticosteroids according to formulation

	Total, n (%)	Dexamethasone ¹ , n (%)	Prednisolone, n (%)	Methylpredniso- lone acetate, n (%)	Betamethasone acetate, n (%)	Triamcinolone acetate, n (%)
Weight gain	342 (50.1)	290 (84.8)	26 (7.6)	15 (4.4)	8 (2.3)	3 (0.9)
Asthma	144 (21.1)	43 (29.9)	74 (51.4)	15 (10.4)	9 (6.3)	3 (2.1)
Allergy (nonspecific) ²	143 (20.9)	96 (67.1)	15 (10.5)	17 (11.9)	11 (7.7)	4 (2.8)
Joint pain	23 (3.3)	5 (21.7)	3 (13.0)	12 (52.2)	2 (8.7)	1 (4.3)
Rheumatoid arthritis	14 (2.0)	2 (14.3)	11 (78.6)	1 (7.1)	0 (0.0)	0 (0.0)
Miscellaneous ³	16 (2.3)	2 (12.5)	10 (62.5)	3 (18.8)	1 (6.3)	0 (0.0)
Total	682 (100.0)	438 (64.2)	139 (20.4)	63 (9.2)	31 (4.5)	11 (1.6)

¹ More than one type used by some and different routes of administration including oral tablets, syrup and injections.

² Allergy includes eyes, nose, cough, dyspnea and skin including urticaria and itching.

³ Includes 4 cases of Behçet's disease, 1 ulcerative colitis, 2 peripheral neuropathy, 2 nephrotic syndrome, 3 immune thrombocytopenic purpura, 3 obstructive airway disease, and 1 hair fall.

Table 4. Symptoms and signs of corticosteroid abuse and complications¹

Symptoms and signs	n (%)
Thin skin	682 (100.0)
Moon face	628 (92.0)
Striae	351 (51.4)
Malaise/fatigue	330 (48.3)
Buffalo hump	317 (46.4)
Central obesity	310 (45.4)
Supraclavicular fat pad	278 (40.7)
Diabetes mellitus	121 (17.7)
Addisonian crisis ²	105 (15.3)
Whole-body obesity	99 (14.5)
Hypertension	80 (11.7)
Fungal skin infection	66 (9.6)
Cataract	59 (8.6)
Glaucoma	6 (0.8)
Other features ³	59 (8.6)

¹ Patients may have more than one feature.

² Because most of those who stopped it did that suddenly.

³ Repeated vomiting, severe hyperemesis gravidarum.

and 40.7%, respectively. Diabetes mellitus was seen in 17.7% (all patients admitted that their diabetes began after they started corticosteroids and some of them had presenting symptoms of diabetes for the first time) and 15.3% presented with addisonian crisis. Whole-body obesity was seen in 14.5% and hypertension in 11.7%. Fungal skin infection was seen in 9.6% and cataract in 8.6%.

Discussion

Most of our patients were married females and unemployed or housewives. The majority were from a low social class, the poorest part of the city center and either had normal weight or were overweight.

In spite of the known side effects, most of the people (83.5%) thought that corticosteroid use was safe and as such did not feel guilty for using such medication. They had been using it for long periods of time and more than half were still using them during the study period. Approximately half (52.3%) claimed they used the drug for the first time based on physician's advice, followed by the patients themselves to become fat, beautiful and marry (however this was difficult to ascertain because it was unlikely that a physician would prescribe these dangerous drugs for weight gain). It seems that previous prescriptions could have served as the basis for subsequent self-medication. Most common sources of drugs were pharmacies or street vendors and less than half of them have a first-degree relative using corticosteroids. The most frequently cited reason for self-medicating was to gain weight and subjects used mostly dexamethasone followed by oral prednisolone, which is consistent with a previous study done in Morocco [23].

In a clinical study on the misuse of topical corticosteroids in Teaching Hospitals in Al-Najaf in Iraq for the period 2001–2002, 7.9% had misused topical corticosteroids. About half were aged 10–19 years. Potent and highly potent preparations were the most commonly used. In 34.3% of cases, medical staff were responsible for pre-

scribing/recommending the drugs [12]. Before their first visit to a specialized department in México, nearly two thirds of rheumatologic patients had taken glucocorticoids, which in most cases resulted from inappropriate prescriptions or recommendations by general physicians, specialists other than rheumatologists, and lay people [11].

Reported self-medication is common practice in 42.5% of Jordanians [7], 59% of Nepalese [8] and 83% of patients attending an ENT clinic in Brazil [9], but none of them used corticosteroids [7–9]. Among first-year medical students of the Arabian Gulf University in Bahrain, the practice of self-medication was common and often inappropriate [24], as also observed among adolescents in Kuwait [25].

Most of our patients had developed side effect of corticosteroids, such as thin skin, moon face and presented with addisonian crisis or had diabetes mellitus and complications of drug use. Steroid-induced diabetes had been observed in 5 of 110 patients with arthritis and related disorders, treated by physicians in Pakistan [13].

Some patients in this study presented with addisonian crisis (15.3%) that was accompanied by vomiting and abdominal pain. Endoscopy was not helpful to make the diagnosis. Many patients, especially women, did not inform family members that they were using corticosteroids. Failure to acknowledge use of corticosteroids and withholding such information from attending physicians could lead to a missed diagnosis. It has been established

that exogenous corticosteroid therapy suppresses the production of corticotropin-releasing hormone and corticotropin and can induce adrenal atrophy that may persist for months after the cessation of corticosteroid treatment and could prove fatal during stress [26, 27].

We have a sizable percentage of subjects that use corticosteroids at night only, in which cases they have severe adrenal suppression. Equally important, this study confirmed the previous suggestion [28] that appropriate governmental regulations and inspections are needed to improve the health care system in Iraq.

Limitations

There could have been patients who were using these medications but had not yet developed physical signs and therefore were not included in the study if they denied using corticosteroids. Furthermore, this study could have underestimated corticosteroid nonprescription use in the community especially among poor people, because the study was hospital-based.

Conclusion

This study showed high use of nonprescription corticosteroids in Basrah, Iraq. We therefore recommend appropriate educational programs to alert the population of the untoward side effects of corticosteroids.

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