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RESEARCH ARTICLE

Knowledge, attitude, and practice analysis of corticosteroid use among patients: A study based in the United Arab Emirates

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ABSTRACT

Background: Corticosteroids (CS) have long been known as the most powerful of all known anti-inflammatory agents. Since their introduction in 1949, they have shown pivotal role in the treatment of various serious disorders such as autoimmune diseases, allergic processes, organ transplantation, rheumatologic, dermatological, pulmonary, hematological, ophthalmologic, gastrointestinal disorders, and others. Nevertheless, such massive clinical use does not come without risks, where prolonged use has been linked to several serious side effects. Therefore, careful consideration of precautions recommended for safe use of CS is of paramount importance. **Aims and Objectives:** To assess knowledge, attitude, and practice (KAP) analysis of the proper use of different dosage forms of CS medications in different sets of CS users in the United Arab Emirates (UAE), to explore the extent to which steroid outpatients were well engaged with medication proper use and safety-related behaviors. **Materials and Methods:** A structured interview-based methodology was adopted to assess the KAPs revolving around steroid usage in patients located in the UAE cities; Dubai, Sharjah, Ajman and Al Ain. Patients (n = 250) were selected randomly from different outpatient clinics all over the previously designated cities. The prepared interview questions were selected based on related therapeutics guidelines regarding aspects of proper patients CS use. Data were collected by well-trained researchers to conduct such interviews. SPSS V16.0 (SPSS Inc., Chicago, USA) was used for data analysis. Standard descriptive and analytical statistics were used to analyze the data. Student's t-test was used to compare the mean difference of continuous variables. **Results:** Overall, our study showed poor KAP results among different UAE patients using different CS dosage forms. **Conclusion:** Despite the massive use of CS in almost every clinical settings and its inherent associated risks, patients still needs provisions for better education regarding their medication efficacy, safety, and proper use. By careful follow-up of proper CS use instructions, both patients and physicians would positively reach an optimized cost-effective therapeutic approach with much more improved benefit/risk ratio.

KEY WORDS: Corticosteroid Usage; Adverse Effects; Patient Awareness

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INTRODUCTION

Corticosteroids (CS) have long been considered as the most significantly used drugs in therapy that is highly effective in a vast majority of medical conditions such as rheumatologic, dermatological, pulmonary, hematological, ophthalmologic, and gastrointestinal (GI) disorders. Still, the mechanism by

which CS achieve their beneficial effects is complex and not fully understood.[1] However, such massive clinical success came at the expense of significant health hazards such as bone fractures, osteoporosis, hyperglycemia, obesity, hypertension, cardiovascular disorders, and immunosuppression, especially with their prolonged use.[2]

Keeping this in view, several international guidelines have been set to help streamline CS use.[3] Basic knowledge about CS usage guidelines and adverse reactions appears to be imperative and should be highly stressed to all CS users.

Several measures have been implicated to reduce CS toxicity, such as prescribing it for a clear indication at minimum dose and duration. Patients receiving CS should be thoroughly investigated to assess for any possible contraindications.[4] Preventive vitamin D supplements[5,6] and careful withdrawal over several months should always be mandated with long-term CS administration.[7]

Responsibility to disseminate to patients, the proper knowledge, attitude, and practice (KAP) regarding when, where, and how to use their CS medications lies primarily with the health-care professional. Benefits of use and harms of overuse should be clearly conveyed before dispensing a CS prescription.[8] In fact, preventing adverse reactions of CS with different routes of administration is a major long-term treatment goal in international guidelines.[9]

Oral CS have been used frequently to treat various disorders, however, their potential risks for skin atrophy, obesity, diabetes, hypertension, osteoporosis, cataracts, and cardiovascular complications can be a major source of concern for patients and health-care professionals. Unfortunately, many of these risks cannot be prevented.[10] The wide use of oral CS especially in elderly, necessitate the need to quantify its potential associated risks. Other routes of CS administration although safer than oral CS still pose their own risks, especially with long-term use. Indeed asthma management by direct delivery of inhaled CS medication to the lung have revolutionized asthma treatment,[11,12] however, it still expose patients to risks of systemic effects.[9,13]

In addition, apart from topical CS well-known indications, these medications have been widely used and even abused[14] by both health-care professionals and patients for many undiagnosed skin rashes.[8] Such drugs have been extensively used for treating various skin conditions, without enough clinical evidence for most of them.[1,15] Even ophthalmological CS application still has many inherent risks such as cataracts, persistently raised intraocular pressure,[16,17] and increased susceptibility to infections.[18] So far, the systemic side effects of topical ocular steroids are less clearly defined.[19]

The approach followed in this study was to investigate KAP regarding different CS dosage forms in different sets of CS users in the United Arab Emirates (UAE), to explore the extent to which steroid outpatients were well engaged with medication proper and safe use.

MATERIALS AND METHODS

A cross-sectional study was conducted to assess the knowledge, attitudes, and practices revolving around steroid usage in patients located in the UAE cities; Dubai, Sharjah, Ajman and Al Ain. Patients were selected randomly from different outpatient clinics all over the previously designated cities.

Subjects and Settings

A study population of 250 patients using steroid dosage forms was involved in the study. A structured interview-based methodology was adopted for being less time consuming and more reliable than other methods. Participants working in the medical field or nonsteroid users were excluded from the study. Patients were first screened to find out if they used any of the four different dosage forms of CS studied. These are oral, topical, inhaled, and ophthalmological CS drops. Patients were first asked about general demographic information such as age, gender, marital status, employment, and educational level. Four different interview questions were prepared to cover the four different dosage forms investigated. The prepared interview questions were selected based on related therapeutics guidelines that explained aspects of patients safe and proper CS use.

Data Collection

Data were collected by well-trained researchers to conduct such interviews. Participants were invited to complete the interviews by the researchers, where they first introduced themselves to targeted individuals and explained the main aim of the study. Participants were then asked to sign an informed consent form.

The study was first approved by the Ethics Committee of Dubai Pharmacy College, Dubai, UAE. Moreover, permission from the targeted outpatient clinics was requested and obtained prior conducting the structured participant's interview.

Statistical Analysis

SPSS V16.0 (SPSS Inc., Chicago, USA) was used for data analysis. Standard descriptive and analytical statistics were used to analyze the data. Student's *t*-test was used to compare the mean difference of continuous variables.

RESULTS

Demographic details of the selected steroids users categorized according to dosage form type were summarized in Table 1.

The frequency of using different corticosteroid (CS) dosage forms among the participants was illustrated in Figure 1.

Of the total sample that received oral CS, 17.3%, 12.8%, 12.8%, 9%, 2.3, 1.5%, and 0.8% received it for respiratory diseases, GI diseases, rheumatologic disorders, skin diseases, thyroid gland disorders, organ transplantation, and others, respectively. However, regarding topical CS, most patients used a topical form for their skin disease (95%), infection-related inflammation (4%), and blood disorders (1%). For inhaled CS 76% of patients used it to control their asthma symptoms, while 18% and 6% used it for chronic obstructive pulmonary disease, and other respiratory disorders, respectively.

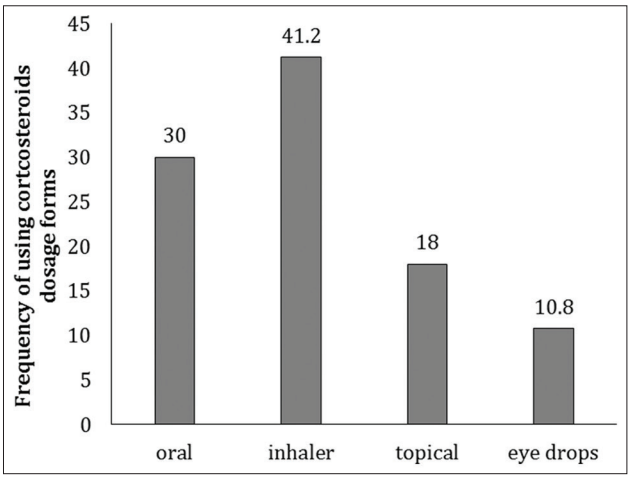

Figure 1: Frequency percentage of using corticosteroids different dosage forms among participants (*n*=250)

Assessment of Knowledge

Knowledge of patients about oral CS use health hazards were presented in Figure 2, where 56%, 49%, 44%, and 20% reported that CS therapy may cause hypertension, osteoporosis, hyperglycemia, and poor healing, respectively.

Of the total oral CS patients sample considered, 65% reported that their main source of oral CS knowledge was health-care professional, followed by (18%) from media, websites, and (17%) from family and friends.

For inhaled CS therapy patients were investigated about their knowledge about their medication effectiveness in reducing their lung inflammation, bronchoconstriction, and exacerbations. 85% of patients were already aware of their medication role to control their condition.

Inhaled CS patients' knowledge source was mainly (75%) health-care professionals, 5% from reading and personal

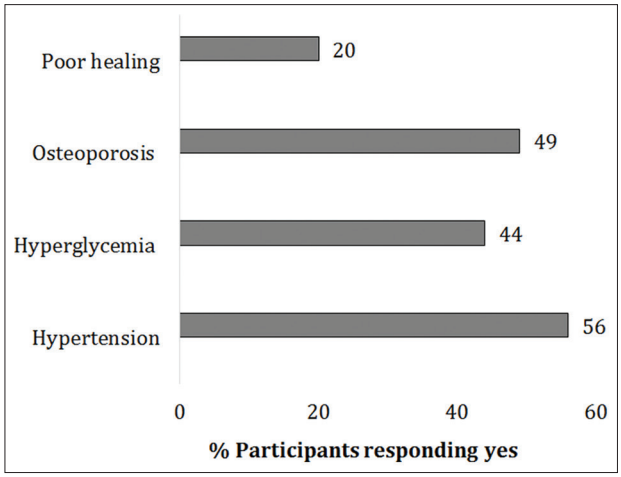

Figure 2: Frequency percentage of patient knowledge about oral corticosteroids side effects (*n*=75)

Table 1: Demographic characteristics of selected steroid dosage forms user (*n*=250)

Variable	Frequency (%)			
	Oral CS (*n*=75)	Inhaled CS (*n*=103)	Topical CS (*n*=45)	Ophthalmological CS (*n*=27)
Gender				
Male	33 (44)	56 (54.3)	18 (40)	11 (40.7)
Female	42 (56)	47 (45.6)	27 (60)	16 (59.3)
Age				
25-35	32 (44)	42 (40.8)	12 (44.4)	4 (14.8)
36-46	29 (38.7)	43 (41.8)	32 (53.3)	14 (51.9)
47-65	13 (17.3)	18 (17.5)	1 (2.2)	9 (33.3)
Marital status				
Married	56 (74.6)	59 (57.3)	28 (62.2)	13 (48.1)
Single	19 (25.3)	44 (42.7)	17 (37.7)	14 (51.8)
Educational level				
Secondary school	12 (16)	26 (25.2)	15 (33.3)	11 (40.7)
University	56 (74.7)	72 (69.6)	29 (64.4)	16 (59.3)
Postgraduate degree	7 (9.3)	5 (4.9)	1 (2.2)	0 (0)

CS: Corticosteroid

experience, then friends and family account for 20% of participants' knowledge.

For topical CS therapy, when patients were asked about knowledge of duration to use their topical treatment, 66% reported not really sure how long. Regarding knowledge of topical CS health hazards such as skin thinning, mouth rash, skin hypopigmentation, irritation, and or increased susceptibility to skin infections, 74.2% of patients reported their a lack of knowledge about any of this, 14.6% responded no, and only 11.2% were aware of this fact as illustrated in Figure 3.

For topical CS, 71% of the patients' source of information was from health-care professionals (physicians and pharmacists) then from reading 4%, family and friends 25%. For CS eye drops, patients gained information mostly from physicians and pharmacists (67%), then family and friends (24%), followed by reading (9%).

For ophthalmological CS, 71% of patients reported a lack of knowledge about monitoring their eye pressure when using the CS for a long time, and only 29% knew this fact.

Assessment of Attitude

When patients were asked about their perception about oral CS safety, majority of them (62.5%) believed that oral CS is not safe, while 29.5% considered it safe drugs and others (8%) stated they cannot tell. Moreover, 64.2% of patients believed that these drugs are highly interacting drugs with only 32.4% believed it will not cause any drug interactions.

Regarding topical CS therapy, 39% of patients reported that they believed they suffered from topical CS effects, while 61% did not. Moreover, 47% of patients thought these side effects were reversible, while 12% thought it is irreversible and others claimed they do not know (41%).

For inhaled CS, patients were investigated about their concerns or fears regarding their inhaled medication use, where a significant number of patients (69%) reported fear of weight gain, increased infections, and bone fractures. 55% of patients reported a lack of adherence to their inhaled CS medication as they thought that their prescribed bronchodilators are probably enough to control their symptoms.

Regarding ophthalmological eye products, 72% of patients reported that wearing contact lenses during medication application is unsafe, while 28% reported it to be safe. In addition, 60% thought they suffered from side effects during applying CS eye drops while 40% did not.

Assessment of Practice

First regarding oral CS patients (n = 75), patients were asked about their drug dosing schedules compliance and about mode of stopping their CS oral treatment, results have shown that the majority of patients (65.3%) were compliant with proper morning dosing regimens. However, still, a significant remaining portion of patients (26.3%) did not follow the proper dosage regimens timings.

With respect to the mode of stopping treatment, despite that 62.7% of patient followed their physicians' guidelines about gradual treatment cessation, still, a significant remaining portion of patients of 28% stopped it suddenly without referring to physician. As illustrated in Figure 4, patients were asked if they actually take any supplement with their therapy, reporting that 28.6% received none, while 37.3%, 31.5%, and 2.6% received calcium, vitamin D, and vaccine, respectively. Only 22% of patients reported receiving antiulcer medication with their CS medication, while others denied taking any.

For inhaled CS patients (n = 103), 39% reported following the proper inhalation instructions by shaking the inhaler device and initiating slow deep breath inhalation followed by breath hold for 10 s, while 61% reported that they did not comply

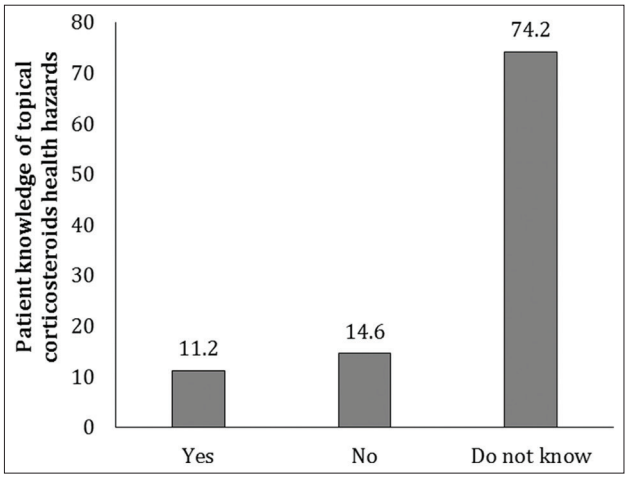

Figure 3: Frequency percentage of patient knowledge about topical corticosteroids health hazards, (n=45)

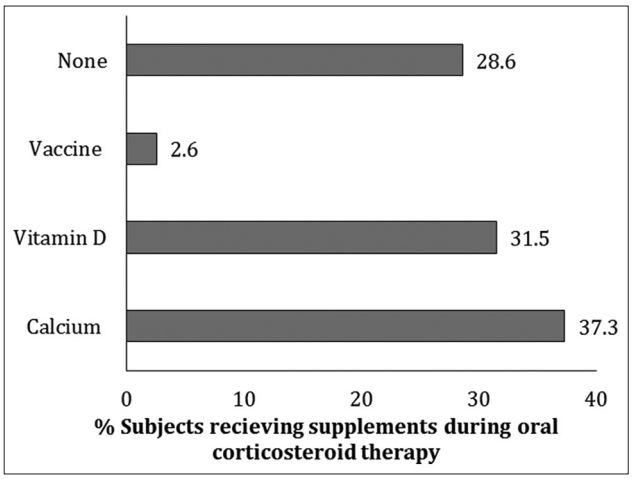

Figure 4: Frequency percentage subjects receiving supplements during oral corticosteroids therapy, (n=75)

with such inhalation instructions. Moreover, 27% of patients reported gargling or drinking water after dose inhalation while 73% did not.

For topical CS users, 74% reported applying an emollient for their dry hand feeling during application of topical CS while 26% did not. Moreover, 69% of patients reported they are using their topical dosage form based on self-prescription. 59% reported even using an old prescription for a related family or a friend who had a similar skin condition. When patients asked about their topical CS dosing, 69% reported applying it once or twice daily while a 31% reported applying it as frequently as needed to relieve their symptoms.

DISCUSSION

Targeting health-care professional to implement a better patient education is of paramount importance especially with such massively used drugs such as CS. In this study, most patients considered oral CS as highly potentially hazardous drugs, but their knowledge about its associated risks was poor. Only, 56%, 49%, 44%, and 20% of patients reported that oral CS therapy may cause hypertension, osteoporosis, hyperglycemia, and poor healing, respectively. As observed from the previous results, 26.3% and 28% of patients were not compliant with proper morning dosing regimens or gradual CS tapering off, respectively, which posed them to a higher risk of developing adrenal suppression. In addition, only 37.3%, 31.5%, and 22% of patients received concurrent calcium, vitamin D, or antiulcer medications, respectively. Ignorance regarding CS risks and necessary precautions highlighted inferior patient education in this regard. For inhaled CS used in asthma management, either fears from using the drug due to anticipated side effects or noncompliance due to assumptions that the inhaled bronchodilator alone should be sufficient to control their disease has been recorded by 69% and 55% of patients, respectively. Only 61% of patients followed proper inhalation instructions, and 73% did not gargle or drink water post inhalation, which might contribute to increased incidence of topical adverse effects.[20] Regarding topical CS, a significant number of patients found it appropriate to apply the medication as frequently as was convenient to relieve their conditions, not knowing its possible related health hazards. For CS eye drops many patients had the perception that wearing contact lenses during CS eye drops treatment is unsafe and 33% reported increased infections.

Morning once daily administration have been linked to minimum cortisol suppression and maximum inhibition of total lymphocyte.[21-23] However, in real practice doses are usually given with little regard to administration timing. Attention to applying chronotherapy[24] whenever CS is used should positively impact clinical outcomes.[25] According to international guidelines, gradual tapering off CS dose is highly imperative to avoid serious complications such as hypoadrenal crisis and reactivation of the underlying disease.[26,27] Nevertheless, in clinical practice, there is no clear guidance on the proper withdrawal regimen and it is mostly developed empirically by physicians, however, what matters the most is that CS withdrawal should never be abrupt.[27]

Even for widely known serious CS side effects such as bone fractures, osteoporosis, and ulcers that nearly affects 50% of patients on chronic CS therapy,[28] our results and the previous studies have highlighted the lack of concurrent bone loss or ulcer treatment in most patients.[29,30] The inadequacy of health-care professionals' awareness regarding this matter, is probably due to an insufficient consensus between guidelines regarding proper osteoporosis prophylaxis.[31] Nevertheless, most guidelines state that calcium, vitamin D supplementation,[30,32] and prophylactic gastric protection[33] should be given routinely to steroid patients.

The significant lack of adherence to inhaled CS medication noted in this study is probably due to patients' misconception about the essential role that these drugs play in their disease management plus augmented concerns about its side effects causing reluctance to use the medications. Several studies have strongly related a lack of adherence to proper inhalation treatment and instructions to poor asthma control.[34]

Of note, topical CS patients have overestimated these drugs safety which may effectively contribute to significant patient harm. Topical CS patients should be instructed that these drugs are not the magic wand that would completely treat any skin condition nor excessively use it. The previous studies have even reported that even dermatologists have abused prescribing these drugs for almost any skin related condition.[8,35] Topical CS patients should be instructed that their medication is highly tolerable and safe, but only if used appropriately as per guidelines, otherwise these medications could pose certain risks such as thinning of skin, hypopigmentation, and even short term hypothalamic pituitary adrenal axis alteration.[36,37] However, many patients were aware about the need to apply an emollient at least 30 min post CS application to avoid hampering treatment effectiveness. Although emollients would have no therapeutic effect regarding skin diseases, however, they improve epidermis hydration, reduce water evaporation, reduce itching, and enhance skin appearance thus practically sparing or decreasing CS use.[38]

In this study, most patients were not aware of the need to monitor eye pressure during CS long-term use. Studies have shown that even short-term treatment with CS eye drops still can increase intraocular pressure.[16] These side effects are more pronounced in children or any patients concurrently suffering from glaucoma, or diabetes.[39] Thus, regular tonometry is now becoming a highly demanded monitoring procedure to prevent optic nerve damage.[40]

In this research study, we utilized the structured interview method for data collection. Unlike, questionnaires, this method has the advantage that interviewers can explain questions asked and ensure that they are fully understood by participants, which may allow for a more reliable detailed responses. Moreover, this method helps the participant to focus on the small differences between answers. However, the structured interview process may be more expensive, complex, time consuming, and require skilled interviewers.

CONCLUSION

CS therapy is of fundamental importance in clinical practice. The study highlights the need for better patient education regarding safety, potency, and appropriate use of CS in different dosage forms. By careful follow-up of proper CS use instructions, both patients and physicians would reach an optimized cost-effective therapeutic approach with much more improved benefit/risk ratio. No doubt that continuous improper use of such potent drugs would definitely disrepute such worldwide highly effective drugs.

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