

REVIEW ARTICLE

# The Prevalence of Acne Form Rash Due to Topical and Systemic Corticosteroids Misuse Among Patients in the Age Group 15-50 Years in AL-Diwaniyah Teaching Hos-

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## Abstract:

**Background:** corticosteroids are synthetic derivatives that differ in their metabolic and electrolyte-regulating activities. These agents are employed at physiological doses for replacement therapy when endogenous products are impaired. Long-term use is associated with certain toxicities. Increased use of topical and systemic steroids for the treatment of many skin problems leads to an increase in their side effects and misuse. Steroid components have been synthesized with adequate anti-inflammatory effects and minimal adverse effects. The newest topical corticosteroids are used for the treatment of different dermatoses and allergies. New topical corticosteroids are evaluated to compare the risk/benefit ratio.

**Objectives:** The present study aims to find the prevalence of acne form rash due to misuse of topical and systemic corticosteroids among patients aged 15-50 years in AL-Diwaniyah Teaching Hospital in Iraq.

**Subjects and methods:** This cross-sectional study and hospital-based based involved 112 patients who answered a questionnaire which consisted of 23 questions about patients and drugs. This study started on March 8th and ended on June 8th, 2023 during this period data was collected from the outpatients in the dermatological unit in Al-Diwaniyah Teaching Hospital.

**Results:** The side effects of steroid use among the study participants are shown in Table 1. Acne and redness were reported in 54 (48.2%) of the cases. Hyper-pigmentation was reported in 24 (21.4 %) cases. Pruritus and dryness were reported in 21 (18.8 %) of them. Rosacea was reported in 4 (3.6 %) cases. Hirsutism was reported in 3 (2.7 %) samples. Photosensitivity was reported in 2 (1.8 %), infection in 2 (1.8%), and allergy reported in 2 (1.8%) of them. The mean age of all the enrolled subjects was 29.39 ±9.93 years and the mean age of subjects with acne was significantly lower than the subjects with other symptoms, 23.13 ±6.45 years versus 35.22 ±9.03 years, respectively ( $p < 0.001$ ).

**Conclusion:** The study revealed that steroids induce acne is a common problem. Cosmetic concerns, over the counter availability of topical corticosteroids, media advertisement of facial creams in Iraq, and the lack of knowledge about side effects and doses of steroids led to the misuse of drugs.

## Keywords:

Corticosteroids, side effects, Acneiform rash, over the counter drugs, media advertisements.

## Introduction

Corticosteroids are synthetic analogs of natural steroid hormones that are produced from the cortex of the adrenal glands. Synthetic corticosteroids were divided according to their uses and effects on the human body into two classes topical steroids and systemic steroids (1). The classification of corticosteroids by the World Health Organization (2) groups them into four categories. Ultrahigh potency is represented by Class I, while high potency includes Classes II and III. Moderate potency classes IV and V, and low potency consists of Classes VI and VII. In contrast, the "British National Formulary" cataloging divisions topically corticosteroids into four modules,

regardless of the vehicle used (3). Corticosteroids are associated with serious risks, especially at high doses for extended periods (4). In dermatology, side effects are many, such as skin atrophy, acneiform, easy bruising, alopecia and hirsutism, perioral dermatitis, and stretch marks (5). Acneiform eruptions refer to a group of skin disorders that resemble acne vulgaris. Hormonal contraceptives containing progestogens with androgenic activity stimulate follicular keratinocyte proliferation and increase sebum production, leading to acne development (6). Treatment of Acneiform is important and first drug termination should be considered. If it is not possible, topical treatments such as hydrocortisone 1% cream and for Grade 3 cases, sys-



temic doxycycline 100 mg twice daily are required. In Grade 4 cases, intravenous antibiotics are added (7). Retinoids, reducing sebum production, retinoids should not be prescribed for pregnant and pregnancy-planning women (7).

### Subjects and Methods

In order to evaluate the prevalence of acne form rash due to misuse of topical and systemic corticosteroids in the dermatological unit department of medicine in Al-Diwaniyah Teaching Hospital, the present study was designed to be cross-sectional and a hospital-based one. The study was carried out on 112 outpatients and started on the 8th of March and ended on the 8th of July 2023. All the patients with corticosteroid misuse were enrolled in this study based on the history of drugs used and clinical examination of the skin lesion provided that they were in age between 15 and 50 years old. Any patients younger than 15 years or older than 50 years were excluded from the study and the individuals who refused to participate in the study were also excluded from the study in addition to the pregnant females. A questionnaire was prepared including a number of questions to evaluate the problem variables which were demographic characteristics and more detailed questions about steroid drugs.

The study was approved by the institutional ethical approval committee and formal consent was obtained from the Directorate of Health in Al-Qadisiyah province, the formal representative of the Iraqi Ministry of Health. Verbal consent was obtained from each participant after a full illustration of the aim and procedures related to the current study. Data were collected and transformed into a spreadsheet of Microsoft Office Excel 2010 and then into an SPSS (statistical package for social sciences) version 23. Numeric quantitative data were expressed as mean, range, and standard deviation (SD), whereas, qualitative data were expressed as numbers and percentages. The Chi-square test was used to evaluate the association between any two categorical variables. The level of significance was considered at  $P \leq 0.05$ .

### Results

The proportion of side effects of steroid use among the study sample is shown in Table 1. Acne and redness were reported in 54 (48.2%) of the cases. Hyper-pigmentation was reported in 24 (21.4 %) cases. Pruritus and dryness were reported in 21 (18.8 %) of them. Rosacea was reported in 4 (3.6 %). Hirsutism was reported in 3 (2.7 %). Photosensitivity was reported in 2 (1.8 %), infection in 2 (1.8%), and allergy reported in 2 (1.8%) individuals.

Table 1: The frequency distribution of enrolled subjects according to side effects of steroid use

Symptoms	Frequency	Percent
Acne and redness	54	48.2
Hyperpigmentation	24	21.4
Pruritus +Dryness	21	18.8
Rosacea	4	3.6
Hirsutism	3	2.7
Photosensitivity	2	1.8
Infection	2	1.8
Allergy	2	1.8

Total	112	100
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The socio-demographic characteristics of the subjects enrolled in this study are shown in Table 2. The mean age of all the enrolled subjects was  $29.39 \pm 9.93$  years and the mean age of the subjects with acne was significantly lower than the subjects with other symptoms,  $23.13 \pm 6.45$  years versus  $35.22 \pm 9.03$  years, respectively ( $p < 0.001$ ). The study included 25 (22.3 %) males and 87 (77.7 %) females and there was no significant difference in gender ( $p = 0.256$ ). The study included 52 (46.4 %) married individuals and 60 (53.6 %) unmarried and there was a significant difference in marital status between the acne group and the other symptoms groups ( $p < 0.001$ ). The study included 29 (25.9 %) of low economic status, 60 (53.6 %) of moderate economic status, and 23 (20.5 %) of high economic status and there was a significant difference in economic status between the acne group and the other symptoms groups ( $p = 0.001$ ). The study included 44 (39.3 %) illiterate subjects, 18 (16.0 %) at the primary education level, 16 (14.3 %) of secondary education level, and 34 (30.4 %) of tertiary education level and there was a significant difference in education level between the acne group and the other symptoms groups ( $p < 0.001$ ).

Table 2: Socio-demographic characteristics of subjects enrolled in this study

Characteristic	Total n = 112	Acne and redness n = 54	Other symptoms n = 58	P
<b>Age (years)</b>				
Mean $\pm$ SD	29.39 $\pm$ 9.93	23.13 $\pm$ 6.45	35.22 $\pm$ 9.03	<0.001 I ***
Range	15 -50	15 -39	17 -50	
<b>Gender</b>				
Male, n (%)	25 (22.3 %)	15 (29.8 %)	10 (17.3 %)	0.256 C
Female, n (%)	87 (77.7 %)	39 (72.2 %)	48 (82.7 %)	NS
<b>Marital status</b>				
Married, n (%)	52 (46.4 %)	38 (70.4 %)	14 (24.1 %)	<0.001 C ***
Not married, n (%)	60 (53.6 %)	16 (29.6 %)	44 (75.9 %)	
<b>economic status</b>				
Low, n (%)	29 (25.9 %)	7 (13.0 %)	22 (37.9 %)	0.001 C ***
Moderate, n (%)	60 (53.6 %)	28 (51.9 %)	32 (55.2 %)	
High, n (%)	23 (20.5 %)	19 (35.1 %)	4 (6.9 %)	
<b>Educational level</b>				
Illiterate, n (%)	44 (39.3 %)	9 (16.7 %)	35 (60.4 %)	<0.001 C ***
Primary, n (%)	18 (16.0 %)	10 (18.5 %)	8 (13.8 %)	
Secondary, n (%)	16 (14.3 %)	11 (20.4 %)	5 (8.6 %)	
Tertiary, n (%)	34 (30.4 %)	24 (44.4 %)	10 (17.2 %)	

n: number of cases; SD: standard deviation; I: independent samples test; C: chi-square test; NS: not significant; \*\*\*: significant at  $p \leq 0.001$

The sources of steroids are shown in Table 3. The cosmetic shop was reported in 55 (49,1%) cases, the pharmacy was reported in 16 (14.3%) cases, online was reported in 16 (14.3 %) cases, shared was the source in 16 (14.3 %) cases and the nurse was the source in 9 (8.0 %) cases, there was no dermatologists source seen during the period of study (0%) and there was no significant difference in the source of steroid between the acne

group and other symptoms groups (p = 0.232)

Table 3: Source of steroids

Characteristic	Total n = 112	Acne and redness n = 54	Other symptoms n = 58	P
Source of steroid				
Cosmetic shop, n (%)	55 (49.1 %)	22 (40.7 %)	33 (56.9 %)	0.232 C  NS
Pharmacy, n (%)	16 (14.3 %)	7 (13.0 %)	9 (15.5 %)	
Online, n (%)	16 (14.3 %)	9 (16.7 %)	7 (12.1 %)	
Shared, n (%)	16 (14.3 %)	9 (16.7 %)	7 (12.1 %)	
Nurse, n (%)	9 (8.0 %)	7 (13.0 %)	2 (3.4 %)	
Dermatologist, n (%)	0%	0%	0%	

n: number of cases; C: chi-square test; NS: not significant

The types of used steroids are shown in Table 4 topical Labeled type was reported in 10 (8.9 %), the topical off labeled type was reported in 95 (84.8 %) cases and systemic steroids were reported in 7(6.3) cases. There was no significant difference in the type of steroid between the acne group and the other symptom groups (p = 0.717). The duration of use of steroids as days and weeks were seen in 19 (17.0 %), months were seen in 51 (45.5 %) and years were seen in 42 (37.5 %) and there was a significant difference (0.015) so that months duration of use was associated with acne group.

Table 4: Types of steroid used and duration of use

Characteristic	Total n = 112	Acne and redness n = 54	Other symptoms n = 58	P
Type of steroids				
Topical Labeled, n (%)	10 (8.9 %)	6 (11.1 %)	4 (6.9 %)	0.717 C  NS
Topical Off labeled, n (%)	95 (84.8 %)	45 (83.3 %)	50 (86.2 %)	
Systemic steroid	7 (6.3 %)	3 (5.6 %)	4 (6.9 %)	
Duration of use				
Days and weeks, n (%)	19 (17.0 %)	10 (18.5 %)	9 (15.5 %)	0.015 C *
Months, n (%)	51 (45.5 %)	31 (57.4 %)	20 (34.5 %)	
Years, n (%)	42 (37.5 %)	13 (24.1 %)	29 (50.0 %)	

n: number of cases; C: chi-square test; NS: not significant; \*: significant at p ≤ 0.05

Times of taking steroids are shown in Table 5. Once-per-day use was reported in 76 (67.9 %) cases, three-times per-week use was reported in 12 (10.7 %), irregular use was reported in 18 (16.1 %), and once-per-month use was seen in 6 (5.4 %) and there was no significant difference in these times between the acne group and the other symptoms groups (p = 0.907).

Table 5: Times of taking steroids

Characteristic	Total n = 112	Acne and redness n = 54	Other symptoms n = 58	p
Times to take steroid				
Once per day, n (%)	76 (67.9 %)	35 (64.8 %)	41 (70.7 %)	0.907 C  NS
Three times per week, n (%)	12 (10.7 %)	6 (11.1 %)	6 (10.3 %)	
Irregular, n (%)	18 (16.1 %)	10 (18.5 %)	8 (13.8 %)	
Once per month, n (%)	6 (5.4 %)	3 (5.6 %)	3 (5.2 %)	

n: number of cases; C: chi-square test; NS: not significant

### Discussion

The Proportions of Side Effects of Steroid Use Among the Study Samples

In this study, it was observed that most patients were complaining of acne and redness which was reported in 51 (48.6 %) cases; however, other side effects were reported such as hyper-pigmentation, pruritus, dryness, rosacea, hirsutism, and photosensitivity. Compared to (Khalifa, 2021), skin thinning (21.3%) was the most common adverse effect (8). According to (Ravindran, 2021), common side effects included erythema, hypopigmentation, tinea incognito, striae, atrophy, and visible veins (9). Based on the observation by (Gupta, 2022), Melasma was the most common adverse effect in 483 (27.8 %) of the patients, followed by comedones acne in 457 (26.3 %) (10).

The Socio-demographic Characteristics of the Enrolled Subjects in the Study

In this study, a comparison of characteristics of subjects with acne with those of subjects with other side effects was made aiming at identifying the risk factors associated with the development of these side effects. It had been shown that the subjects with acne were significantly younger than those subjects with other side effects. Therefore, the age of the subjects should be taken into consideration when treating them using topical steroids. Compared to a study by (Khalifa, 2021), in which more than 46.1% of the participants were 21 to 30 years old (8), Gupta (2019) performed a study on steroid misuse and found that the mean age was 31.35 years with a range of 18-69 years (11). Singh and Rolaniya (2023) observed that most of the patients belonged to the age group of 18-30 years (50, 50%) with a mean age of 32.8 ± 8.2 years (12). In the current study, most of the subjects were females accounting for 78.1 % and the smaller proportion was represented by males (21.9 %) indicating that misuse of topical steroids was more frequently encountered in females than in males in the Iraqi community. Compared to (Rachamanti, 2022), 63% of the patients were females (13). A comparable ratio of married and unmarried individuals was observed in this study; however, acne was less reported in married subjects and this can be explained by the fact that acne was more frequently seen in younger subjects

who were mostly not married. Based on a study by (Dey, 2014), married individuals used steroids were less frequent than unmarried individuals (14).

#### The Characteristics of Steroid Agents Used by the Enrolled Subjects in the Study

According to the present findings, the sources that were identified represented cosmetic shop that was reported in 55 (52.4 %) cases, pharmacy was reported in 12 (11.4 %) cases, online was reported in 16 (15.2 %) cases, shared was the source in 16 (15.2 %) cases and nurse was the source in 6 (5.7 %) cases and there was no significant difference in the sources of steroid between the acne group and the other symptoms groups. In the present study, the types of used steroids were labeled type which was reported in 10 (9.5 %) and off labeled type was reported in 95 (90.5 %) cases. There was no significant difference in the type of steroid between the acne group and the other symptoms groups ( $p = 0.447$ ). In the current study, times of taking steroids were once per day that was reported in 71 (67.6 %) cases, three times per week use was reported in 12 (11.4 %), irregular use was reported in 17 (16.2 %), and once per month was seen in 5 (4.8 %) and there was no significant difference in these times between the acne group and the other symptoms groups. So frequent use within a short duration was seen in a great proportion of individuals and this is the reason why the side effects are common following misuse of these topical steroids because of the relatively high dose associated with frequent application.

#### Conclusion

Steroid-induced acne is a common problem. In this study, both sexes were involved, but the females were found to be more affected and were with low to moderate economic status. The use of social media and famous people, with the absence of censorship on these social media increased this problem.

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