Original Article

Clinico-epidemiological study of mucocutaneous manifestations among substance users: A cross-sectional study

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Abstract

Background Cutaneous examination often reveals characteristic signs of systemic disease, making the skin a valuable diagnostic interface for internal medicine. We can use this principle when we suspect drug abuse. The misuse of substances exerts harmful effect on physical and mental wellbeing. Cutaneous findings may appear acutely such as facial flushing, ecchymosis, etc. The long term abuse contributes to serious conditions including cirrhosis, pancreatitis and cancers.

Objective To profile the clinico-epidermiological, clinical, and dermatological characteristics of skin diseases in individuals with substance use disorders.

Methods In this observational cross-sectional study, we enrolled 200 individuals with active substance use attending Al-Qanat Social Rehabilitation Center, Baghdad, Iraq. Individuals of all age-groups and both genders were included between the period from February 2024 to February 2025. All patients underwent comprehensive history taking and complete dermatological examination and relevant laboratory investigations as indicated.

Results Single substance addiction was noticed in 129 (64.5%) and multiple substance abuse was observed in 71 (35.5%) participants. The most frequently observed manifestations included tattoos 126 (63%), hesitations scars 81 (45%) while pellagra was found in only one participant 39 (19%) had no cutaneous features. The most commonly abused substances were alcohol 60 (30.5%) and amphetamine 46 (23%) while the least frequently reported substances were heroin, accupan and benzodiazepines (0.5%).

Conclusion Chronic cutaneous manifestations particularly tattoos, scars and ulcerations were highly prevalent, reflecting both direct drug toxicity and trauma from administrations routes. The early recognition of cutaneous signs is of importance for more effective diagnosis and treatment and to prevent long-term complications of substance use.

Keywords Substance-Related Disorders; Alcohol-Related Disorders; Amphetamines; Dermatologic signs and symptoms.

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Introduction

Dermatological and mucous membranes' examination serves as a diagnostic window to systemic health, with many internal diseases manifesting through characteristic cutaneous and mucosal findings that enable clinical diagnosis. We can apply this principle when we have suspicion of drug abuse.[1]

Drug abuse is defined as the frequent use of illegal drugs, or the misuse of non-prescription or

prescription drugs, which results in hostile consequences. Drug addiction is characterised by dependence physiologically and inability to abstain from the drug.[2]

Substance abuse arises from confluence of genetic, environmental, social, and psychological factors.[3] Significant environmental risks involve childhood sexual abuse, impaired parent-child relationships, and poor social competence. Further predisposing conditions include illiteracy, scarce recreational facilities, economic hardships, and inadequate housing.[4]

Post 2003, Iraq has witnessed increasing substance abuse and mental health conditions like depression. Predominant substances include alcohol and prescription medicines (benzodiazepines, tramadol, codeine), hashish and amphetamine type stimulants. The Iraqi National Household Survey on Alcohol and Drug Use (INHSAD) found lifetime prevalence rates of 28.8% for tobacco, 8.1% for alcohol, 2.9% for licit drug use, and 0.3% for illicit drug use.[5]

Common routes of illicit drug administration include oral, nasal, inhalation, parenteral, and transdermal.[6] While standard doses produce regulated effects, drug abuse intensifies psychological and systemic impacts, causing severe social and organic dysfunction. The skin is often affected through direct toxicity, injection injury, or neglect with addictive behavior.[7]

The cutaneous manifestations documented in relation to substance use disorders can serve as a clue to the diagnosis.[8] Substance-related complications present locally or systemically and result from: a) the active drug, b) chemical adulterants, or c) microbial contaminants.[9]

The cutaneous complications associated with substance abuse can be classified as:[10]

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1 ***Infectious:*** Candidiasis, skin abscesses and cellulitis, impetigo, deep tissue infections, vascular issues (varicosities/ lymphangitis) and common infestations (scabies, pediculosis).

2 ***Vascular:*** Venous thrombosis, digital ulceration, thrombotic vasculopathy with scar like papule resembling Degos disease and skin ulcers.

3 ***Inflammatory:*** Perioral dermatitis, hypersensitivity reactions such as erythema multiforme, severe immunobullous drug reactions and granulomatous reaction due to foreign body injection.

4 ***Pigmentary:*** Hyperpigmentation at injection site and pigmented atrophic scars.

5 ***Oral mucosa:*** Chronic stomatitis and gingivitis, oral candidiasis, mucosal ulcerations and/or ora-nasal fistula, nasal septal perforation, significant tooth decay and Black hairy tongue.

6 ***Loss of the hair***, change in colour of the hair, follicular hyperkeratosis and perifollicular haemorrhage.

7 ***Nails:*** clubbing and bluish nail staining.

Cutaneous manifestations of alcohol misuse Facial flushing, skin ecchymoses, seborrheic dermatitis and multiple skin comedones. Cirrhosis associated skin finding like: yellow sclera, skin itching, telangiectasia, rosacea, erythema of the palm and Porphyria cutanea tarda are examples of disorders that may be exacerbated by alcohol.[11]

Specific lesions associated with certain drugs:

1 ***Methamphetamine:*** dryness of the skin, pruritus, foul body odour, loss of weight, premature ageing, hyperhidrosis and meth mouth.[12] Formication leads to skin picking and acne excoriae. Lichenoid drug eruptions have been reported.[13]

2 ***Cannabis/ Marijuana:*** leads to arteritis,

claudication, Raynaud's phenomenon, characteristic nail findings comprised splinter haemorrhages, Beau's like lines, and pigmentation of the nail plate, finally leading to loss of nail plate.[14,15]

3 ***Heroin:*** pruritus, pseudoacanthosis nigricans, railroad tracks. Chronic intravenous drug use resulted in recurrent thrombosis followed by extensive perivenular fibrosis, Puffy hands syndrome, popping of the skin, Shooter's patch, shooting tattoos and tourniquet like hyperpigmentation.[16]

4 ***Cocaine:*** Delusional parasitosis or cocaine bugs, Cocaine-related nasal pathology including midline destructive lesions with septal perforation and reactive mucosal hyperplasia (“Snorters’ warts”), epistaxis or perforation of hard and soft palate. Parrot like beak nails and perniosis. Cocaine use via the oral route resulted in significant dental pathologies, including enamel erosion and widespread dental deterioration. Levamisole when mixed with cocaine can lead to Pseudovasculitis and Levamisole purpura.[16]

Methods

An observational, descriptive, cross-sectional survey was carried out at the Al-Qanat Social Rehabilitation Centre, during the period (Feb. 2024 - Feb. 2025). Ethical approval was taken from The Scientific and Research Ethics Committee in the Medical City Department, (approval number 13744 dated 23.12.2024). A total of 200 individuals with active substance use disorder were enrolled using convenience sampling technique, based on attendance at the center during the study period.

Inclusion Criteria: individuals of all ages and both genders, documented history of substance use (any substance), attending Al-Qanat Social Rehabilitation Centre during the study period, and willing to provide informed consent.

Exclusion criteria: patients with known pre-existing skin diseases unrelated to substance use, individuals with severe psychiatric or cognitive impairment preventing history taking and refusal to participate.

A comprehensive history was obtained from each participant, encompassing demographic details (age, sex, occupation, education level and socioeconomic status), substance use characteristics (type of substance, frequency, route of administration and duration of use).

Following informed consent, all patients underwent general physical, systemic and mucocutaneous examinations. Standard laboratory investigations were performed including complete blood count, liver function test, abdominal ultrasonography, and serological testing for hepatitis B, hepatitis C, and HIV. Dermatoscopic evaluation was utilized when indicated to aid in diagnostic confirmation.

Data were collected using a predesigned pro-forma, organized, tabulated, and analyzed using the Statistical Package for Social Sciences (SPSS version 26.0). Descriptive statistics were employed with categorical variables expressed as percentage and continuous variables as mean±standard deviation (SD).

Results

The socio-demographic characteristics of the 200 study participants are summarized in **Table 1**. The mean age of presentation was 29.38±8.4 years. The majority of patients were enrolled from Baghdad Governorate while the lowest were from Karbala and Kirkuk. Regarding occupational statue the majority of patients were workers. In terms of educational level, most patients had primary school education followed by secondary school education while smaller portions being illiterate, graduates, post graduate.

Table 2 demonstrates higher prevalence of alcohol and amphetamine addiction, while heroin, accupan and benzodiazepine being least common, while 71 (35.5%) patients used multiple drugs.

Table 1 Socio-demographic characteristics of study patients.

Parameter	*Number of cases*	*Percentage*
Age		
<20	14	(7%)
20-30	100	(50%)
31-40	54	(27%)
41-50	22	(11%)
51-60	10	(5%)
Gender		
Female	17	(8.5%)
Male	183	(91.5%)
Address		
Baghdad	139	(69.5%)
Babil	10	(5%)
Wasit	9	(4.5%)
Kute	4	(2%)
Basrah	6	(3%)
Mosul	5	(2.5%)
Kirkuk	2	(1%)
Karbala	2	(1%)
Najaf	5	(2.5%)
Anbar	9	(4.5%)
Maysan	4	(2%)
Diyala	5	(2.5%)
Marital status		
Married	100	(50%)
Single	86	(43%)
Divorced	14	(7%)
Education		
Illiterate	9	(4.5%)
Primary	150	(75%)
Secondary	29	(14.5%)
Graduate	9	(4.5%)
Postgraduated	3	(1.5%)
Job		
Student	10	(5%)
Skilled workers	54	(27%)
Construction workers	55	(27.5%)
Driver	31	(15.5%)
Govt. Employee	35	(17.5%)
House wife	7	(3.5%)
Salon	8	(4%)

Regarding mode of intake 98 (49%) patients were using the oral route while only 2 (1%) were using the subcutaneous mode. Duration of addiction was less than a year in 18 (9%), between 1-5 years in 73 (36.5%), between 6-10 years in 41 (20.5%) and more than 10 years in 68 (34%). The mean±SD of duration of intake was 7.89±6.5 years.

The spectrum of dermatological manifestations identified in the patient cohort are summarized in

Table 2 Distribution of study participants by primary substance use.

	Number of cases	*Percentage*
Substance		
Alcohol	61	(30.5%)
Amphetamine	46	(23%)
Lyrica	4	(2%)
Marjuana	2	(1%)
Zolpidem	2	(1%)
Captagon	2	(1%)
Morphine	1	(0.5%)
Heroin	1	(0.5%)
Accupane	1	(0.5%)
Oxazepen	4	(2%)
Phencycline	2	(1%)
Samodnail	2	(1%)
Tramadol	2	(1%)
Benzodiazepine	1	(0.5%)
Multiple (2 or more substances)	71	(35.5%)
Years of intake		
<1	18	(9%)
1-5	73	(36.5%)
6-10	41	(20.5%)
>10	68	(34%)
Mode of intake		
Oral	98	(49%)
Smoking	48	(24%)
Intravenous	6	(3%)
Subcutaneous	2	(1%)
Multiple (2 or more routes)	47	(23.5%)

Table 3 Tattoos were seen in most patients and it was found to be the most common dermatological manifestation seen in 126 (63%) patients. Different types of scars were noted; hesitation scars were seen in 83 (41.4%), atrophic scars in 52 (26%) and skin popping scars in 4 (2%) patients **(Figure 1)**. Pruritus was found in 97 (39.5%) patients and prurigo in 5 (2.5%). Regarding skin infections, scabies was observed in 43 (21.5%), dermatophytosis in 24 (12%), soft tissue infection and skin ulcers in 7 (3.5%).

Oral involvement (pigmentation, dental caries, thrush and meth mouth) were seen in 68 (34%) patients **(Figure 2)**.

Hyperhidrosis localized or generalized, was noted in 48 (24%) patients. Hair involvement was reported in 42 (21%). Nail involvement was seen in 4 (2%) patients.

Table 3 Prevelance and pattern of dermatological manifestations

Skin lesions description	*n*	*%age*
Tattoo	126	(63%)
Hesitation scars	83	(41.5%)
Pruritus	79	(39.5%)
Oral involvement (pigmentation,dental caries,thrush,Meth mouth)	68	(34%)
Atrophic scars	52	(26%)
Stained fingers	49	(24.5%)
Hyperhidrosis	48	(24%)
Scabies	43	(21.5%)
Hair involvement (androgenic alopecia,trichomycosis)	42	(21%)
Acne vulgaris	24	(12%)
Dermatophytosis	24	(12%)
Hand dermatitis	16	(8%)
Acneform eruption	9	(4.5%)
Neurodermatitis	8	(4%)
Skin ulcers and soft tissue infection	7	(3.5%)
Stigma of injectable drugs	7	(3.5%)
Psoriasis	6	(3%)
Seborrheic dermatitis	6	(3%)
Rosacea	5	(2.5%)
Prurigo	5	(2.5%)
Skin poping scars	4	(2%)
Nail involvement (clubbing,leukonychia,koilonychia,dystrophic nail)	4	(2%)
Pellagra	2	(1%)
None	39	(19.5%)

Figure 1 Linear atrophic scars (a-c), hypertrophic scars (d), skin popping scars(e,f).

Figure 2 Oral manifestations of methamphetamine (a,b) poor oral hygiene and tooth loss, (c) meth mouth, (d) glossitis.

Dermatological disorders like acne vulgaris 24 (12%), hand dermatitis 16 (8%) and other disorders psoriasis 6 (3%), rosacea 5 (2.5%) and pellagra 2 (1%) were also seen in the study.

Discussion

Substance abuse is a problem that is growing rapidly in Iraq in the last years. Although it has become a fairly common condition with severe impact on quality of life, no study has dealt with the subject and to our knowledge, this represents the first study to document the dermatological manifestations among individuals with substance abuse in Iraq.

The United Nations Office on Drugs and Crime (2021) documented 275 million global substance users, including 36 million individuals with substance use disorders.[17]

In the current study the most common age group affected was 20-30 years, this was in concordance with the findings of a Pakistani study done by Rafiq *et al.*[1] in which 44% patients were between 25 to 35 years. Conversely, Bansal *et al.*[18] study conducted at India found that (37%) of participants were elderly. This discrepancy may be attributable to differences in sample size and geographical or demographic variations between the study populations.

In our study, most of the patients (75%) had primary school education. Similarly, Bansal *et al.*[18] found the most of them were less educated (41.3%). Sengotuven *et al.*[19] reported that alcohol related dermatological conditions predominantly affected individuals of low socioeconomic status, a finding consistent with our data. Similarity, the high proportion of free workers in our cohort mirrors the occupational distributions noted by Sengotuven *et al.*[19] and Bansal *et al.*[18]

The frequency of substance users in Baghdad was the highest 96.5%. Probably because our study was done in specialized treating centre for substance use in Baghdad.

Consistent with previous reports by Muzil *et al.*[17] Bansal *et al.*[18] Sengotuven *et al.*[19] and Al- Hemiary *et al.*[20] alcohol was identified as the primary substance of abuse in our cohort, followed by amphetamine-type stimulants. The legal statue of alcohol and the low market price of amphetamines likely drove this pattern, especially among a low-income patient population.

Heroin abuse was seen only in two patients, either alone or with other substances. The largest number of substance users in our study was using single method of intake (76.5%) while in Rafiq *et al.*[1] study half of the patients used multiple routes.

The predominant skin manifestations were scars and tattoos, with hesitation scars present in (41.4%) of cases, a higher proportion than the 16.3% noted by Aslam *et al.*[21] on the forearms. Rafiq *et al.*[1] study roughly 66% presented with different variety of skin scars. 30.7% of injectable heroin users in Aslam *et al.*[21] study and 26% of substance users in Rafiq *et al.*[1] ended up with skin popping scars, while in our study skin popping scars seen in 4 (2%) this could be explained by fewer patients in our research using injection methods. “Skin popping” scars are deep, circular, atrophic lesions which are the hallmark of repeated subcutaneous/ intramuscular drug administration.[1]

Pruritus, reported by 39.5% of our patients, corroborates Aslam *et al.*[21] who identified it as most common dermatological symptom in substance users, notably in those using heroin.

Regarding cutaneous infections most of the patients (21.5%) had parasitic infection (scabies), dermatophytosis in (12%), soft tissue infection and skin ulcers in (3.5%). This finding was also noted by Dhillon *et al.*[22] while in Bansal *et al.*[18] study cutaneous fungal infection affected (22%) and, 4% parasitic infections, the former corroborating high fungal incidence reported by Sengotuven *et al.*[19] Low detection of bacterial infections may be attributed to insufficient laboratory investigations (e.g. bacterial cultures).

Scabies was highly common, driven by poor hygiene, itch-scratch dysregulation, and immunosuppression. It is often misdiagnosed as drug induced delusional parasitosis in psychiatric settings.[22]

Oral involvement (pigmentation, bad hygiene and dental caries, candida and meth mouth) were seen in (34%) of patients in our study. Aslam *et al.*[21] noted oral involvement to be common and seen in (48.5%) of patients, while Rafiq *et al.*[1] study found drug induced oral mucosal changes in (94%) of the cohort.

Hyperhidrosis was seen in (24%) of patients in present study specifically in Amphetamine users, this finding is the same as Aslam *et al.*[21] study where it was seen in 30% of users. Further cutaneous findings included hand dermatitis, seborrheic dermatitis, acne vulgaris and rosacea.

Alcohol abuse is related etiologically to various skin diseases, which include rosacea, psoriasis, seborrheic dermatitis. Pallor, xerosis and jaundice because of liver damage may be seen as well. This finding also seen in Rafiq *et al.*[1] Bansal *et al.*[18] and Sengotuven *et al.*[19] study. Pellagra was seen in 2 patients and both of them were alcoholic.

Conclusion

The present study highlights the growing burden of substance use among Iraqi patients and underscores the importance of recognizing associated cutaneous manifestations. While a wide spectrum of dermatological findings was observed, no direct correlation could be established between specific skin lesions and particular substances used reflecting the multifactorial nature of these manifestations, including drug toxicity, administration techniques and secondary infections or behaviours.

Strengths of the study

1. This one of the first studies to systematically document dermatological manifestations in individuals with substance use disorder in Iraq.
2. The inclusion of all age groups and both genders enhance the findings within the rehabilitation centre.

Limitations of the study

1. The cross-sectional design precludes establishing causal relationships between substance use and specific cutaneous findings.
2. The single-center setting and convenience sampling limit the generalizability of the results.

Recommendations

Dermatological screening should be integrated into routine assessment of individuals with substance use disorder to aid in early detection and management of cutaneous complications. Healthcare provider particularly dermatologist, psychiatrists and primary care physicians should be educated about common skin manifestations. Future multi-center studies with larger sample sizes and longitudinal designs are needed to establish causal relationships and guide evidence-based interventions.

Declaration of patient consent Authors certify that they have obtained all appropriate patient consent.

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Author's contribution

SAS: Have made substantial contributions to conception and design, manuscript writing.

MMM: Substantial contributions to study design, analysis and interpretation of data, manuscript writing.

ATH: Have made substantial contributions to conception and design, acquisition of data, manuscript writing.

AMA: Have made substantial contributions to conception and design, analysis and interpretation of data, critical review of the manuscript.

Every author has given final approval of the manuscript version to be published and agreed to be accountable for all aspects of the work.

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