ORIGINAL ARTICLE

The Clinical Characteristics of Inpatients: An Audit in the Department of Dermatology Hospital Kuala Lumpur Between 2016 and 2020

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Abstract

Background

Although Dermatology is primarily a non-acute, outpatient-centered clinical specialty, some of them require in-patient care for intensive skin management. We aim to describe the demographic data, clinical characteristics, and outcomes of Dermatology inpatients in Hospital Kuala Lumpur (HKL).

Methods

This is a retrospective study on all dermatology inpatients in HKL between 2016 and 2020. Data was obtained from admission records and further analyzed.

Results

A total of 1567 patients were admitted to the Dermatology ward between 2016 and 2020 accounted for 2292 admissions. The mean age was 45 years (range 8-93). The male to female ratio was 1.16:1. The majority were Malaysian (99.2%). Most Malaysian were Malays (60%) followed by Chinese (19.3%) and Indian (17.1%). About 91% of the admissions were arranged from the dermatology clinic. The mean length of stay was 5.06 days (range 0-63). About 20% of the patients required multiple admissions. The main dermatological diagnosis requiring inpatient care were non-infective dermatoses (60.4%) which included eczematous dermatoses, autoimmune dermatoses, psoriasis, cutaneous adverse drug reactions, inflammatory and non-inflammatory dermatoses. This was followed by cutaneous infections (24.5%) and drug allergy testing & drug provocation tests (7.9%). About 3% of patients were transferred to other departments for further intensive management, and the rest were discharged home well. No mortality occurred in the Dermatology ward.

Conclusion

The Dermatology ward HKL managed 2292 admissions between 2016 and 2020. The three main dermatological diagnoses requiring intensive skin management were eczematous conditions, cutaneous infections, and autoimmune dermatoses.

Key words: *Dermatology, Inpatients, Eczema, Cutaneous infection, Autoimmune dermatoses*

Introduction

Skin is the outermost part of the human body and is subject to a spectrum of skin disorders.[1] Despite being the largest organ, dermatology is primarily a non-acute, outpatient-centered clinical specialty.[2] However substantial number of patients still require in-patient care for intensive skin management, advanced nursing care and multispecialty referral. Hospitalization improved patients' dermatologic disorders and

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their quality of life.[3] The Massachusetts General Hospital was the first hospital to develop its first dermatology ward in the United States in 1870.[3] This initiative has led to the development of inpatient services at many academic institutions.[3] To date, inpatient dermatology is available in the United States (US), the United Kingdom (UK), Brazil, South Africa, Eastern India.

With the progression and advancement of therapy, the number of patients requiring inpatient treatment has reduced.[4] In the US and UK, many Dermatology programs have reduced or abolished inpatient services, whereby patients admitted with dermatological conditions are managed by non-dermatologists.[4,5] Psoriasis, cutaneous drug reactions, immunobullous dermatoses, infected ulcers and skin infections remains the main cause of hospitalization worldwide.[2] In Malaysia, only Hospital Kuala Lumpur and Hospital Raja Permaisuri Bainun in Ipoh provide inpatient dermatology services with their designated dermatology wards at present. Being the largest hospital in Malaysia, the Department of Dermatology Hospital Kuala Lumpur (HKL) is a tertiary referral center for patients with complex dermatological disorders and sexually transmitted infections. The dermatology ward, situated at level 1 of the Administration and Financial Block (*Bangunan Pentadbiran dan Kewangan*) of Hospital Kuala Lumpur, has a maximum capacity of 32 beds. All patients admitted to the ward were seen by consultant dermatologists and dermatology trainees daily.

This study aims to describe the demographic data, clinical characteristics and outcome of Dermatology inpatients in Hospital Kuala Lumpur between 2016 and 2020.

Materials and Methods

This is a retrospective study on all dermatology inpatients in HKL between 2016 and 2020. The ward admission record books were retrieved and reviewed. All patients admitted to the Dermatology ward were included into statistical analysis. Data collected included demographics, source of admission, types of dermatoses, number of admissions, length of stays and their outcomes. Both quantitative and qualitative data were examined using Microsoft Excel and further analysed through statistical approach.

Results

There was a total of 1567 patients admitted to the Dermatology ward in Hospital Kuala Lumpur during the study period, involving 2292 admissions and 2661 diagnoses were made with an average of 458 admissions per year between 2016 and 2020. Although dermatology ward has a maximum capacity of 32 beds, the bed occupancy by patients with pure dermatological diseases were intermittently affected by temporary lodging of patients from other specialities during the study period of 2016 to 2020. These includes patients from the Department of Urology and others due to temporary closure of the respective wards for renovation and upgrading works. In addition, the strike of pandemic COVID-19 has led to a massive increase of in-patient demand for COVID-19 in Hospital Kuala Lumpur. As a result, the bed number catered purely for dermatological diseases has reduced to a maximum 10 beds since March 2020 to date.

The demographic characteristics of in-patients with pure dermatological diseases are illustrated in Table 1. The youngest patient admitted to the Dermatology ward was 8 years old and the oldest was 93 years old. The mean age was 45 years with a male to female ratio of 1.16:1. Nearly half of the patients (49.4%) were aged between 20-49 years old, and about a third of them (31.3%) were between 50-69 years.

Among the Malaysian inpatients, the Malays contributed to 60.1%, followed by Chinese 19.3%, Indians 17.1% and others, 1.7%. Forty (1.7%) patients were foreigners, most of them were Indonesians, 23 (1.0%). The majority of patients admitted were male, 1232 (53.8%). Most patients (90.7%) were admitted from the dermatology clinic and 143 (6.2%) were transferred from the department of medicine or other hospitals to the dermatology ward. Only 3.1% of patients were admitted from

the Department of Accident and Emergency. About 19.4% of the patients required multiple admissions, of which 11 (0.7%) of them had more than 10 admissions. The average length of stay was 5.06±4.95 days with the longest stay of 63 days. About 4.3% required an inpatient stay of more than 2 weeks.

Table 1. The demographic data of 1567 patients admitted to Dermatology ward Hospital Kuala Lumpur between 2016 and 2020

Characteristics		n=1567 (%)
Mean age		45.04±18.79
Gender	Male	1232 (53.8)
	Female	1060 (46.2)
Mean length of stay (days)		5.06±4.95
Length of stay (days)	0-7	1903 (83.0)
	8-14	284 (12.4)
	15-21	63 (2.7)
	22-28	18 (0.8)
	More than 28 days	18 (0.8)
No recurrent admission		1263 (80.6)
Recurrent admission (No)	2 to 5	271 (17.3)
	6 to 10	22 (1.4)
	11 to 15	5 (0.3)
	16 to 20	6 (0.4)
Number of admissions per year	2016	483 (21.1)
	2017	482 (21.0)
	2018	437 (19.1)
	2019	494 (21.6)
	2020	396 (17.3)
Malaysian - Ethnicity	Malay	1377 (60.1)
	Chinese	443 (19.3)
	Indian	392 (17.1)
	Others	40 (1.7)
Foreigner		40 (1.7)
Source of admission	Dermatology clinic	2079 (90.7)
	Department of Medicine	121 (5.28)
	Accident & Emergency	70 (3.1)
	Other hospitals	10 (0.43)
Outcome	Discharge home	2229 (97.3)
	Transfer of care	63 (2.7)

As shown in Table 2, the main dermatological diagnosis requiring inpatient care were non-infective dermatoses (60.4%) followed by infective dermatoses (24.5%), drug allergy testing and drug provocation tests (7.9%) and cutaneous malignancy (1.1%). A hundred and sixty-five (6.1%) patients had other non-dermatological diagnoses. Eczematous dermatoses were the most frequent non-infective conditions that required admission in our cohort. These included severe atopic dermatitis, severe contact dermatitis, infected discoid eczema, idiopathic photodermatitis etc. The main autoimmune dermatoses managed in dermatology ward HKL was pemphigus followed by cutaneous vasculitis. Psoriasis, cutaneous adverse drug reactions, other inflammatory and non-inflammatory dermatoses were other non-infective dermatoses that were managed in the ward. The type of psoriasis that required hospitalization included extensive plaque psoriasis, erythrodermic psoriasis, generalized or severe localized pustular psoriasis and severe acute psoriatic arthropathy. There was a total of twenty-nine patients admitted for management of cutaneous malignancies, with the majority being mycosis fungoides, followed by extramammary Paget's disease.

A hundred and thirty patients were admitted for cutaneous adverse drug reactions, of which almost half (51 patients) were due to drug-induced epidermal necrolysis namely Steven Johnson syndrome (SJS) and Toxic Epidermal Necrolysis (TEN), as shown in Table 3. This was followed by eighteen patients with acute generalized exanthematous pustulosis (AGEP), fourteen with drug rash with eosinophilia and systemic symptoms (DRESS) and seven with fixed drug eruptions (FDE).

Infective dermatoses accounted for nearly a quarter of the total admissions, with more than half of them being bacterial infection 378 (57.8%) as shown in Table 4. This was followed by fungal infections 113 (17.3%) and viral infection 105 (16.1%). About 8% of patients were electively admitted for drug allergy skin tests and drug provocation test.

Most patients 2229 (97.3%) were discharged home after treatment and 63 (2.7%) were transferred to other units for further management. There was no mortality occurred in the dermatology ward for the past 5 years.

Table 2. The Main types of dermatoses leading to admission to Dermatology ward Hospital Kuala Lumpur between 2016-2020

Clinical diagnosis	n=2661 (%)
Non infective dermatoses	**1608 (60.4)**
Eczematous dermatoses	*687 (42.7)*
Autoimmune dermatoses	*478 (29.7)*
Psoriasis	*215 (13.4)*
Cutaenous adverse drug reactions	*130 (8.1)*
Inflammatory	*86 (5.3)*
Non inflammatory	*12 (0.7)*
Cutaneous infections	**654 (24.5)**
Bacterial infection	*378 (57.8)*
Fungal	*113 (17.3)*
Viral	*105 (16.1)*
Mycobacterium	*35 (5.4)*
Parasites	*23 (3.5)*
Drug allergy testing and drug provocation tests	**209 (7.9)**
Cutaneous malignancy	**29 (1.1)**
Mycosis Fungoides	*22*
Extramammary Paget's Disease	*4*
Anaplastic Large Cell Lymphoma	*1*
Gorlin Syndrome	*1*
Sezary Syndrome	*1*
Other non dermatological diagnosis	**161 (6.0)**

Table 3. The detailed diagnosis of Non-Infective dermatoses that were managed in Dermatology ward Hospital Kuala Lumpur between 2016-2020

Type	n=1608
Eczematous dermatoses	**687**
Eczema – non erythrodermic	277
Erythrodermic eczema	204
Contact dermatitis	133
Photodermatitis	36
Dermatomyositis	18
Seborrhoeic dermatitis, radiation recall dermatitis, pompholyx, nodular prurigo, lichen simplex chronicus etc	19
Autoimmune dermatoses	**478**
Pemphigus	246
Bullous pemphigoid	90
Cutaneous vasculitis	103
Connective tissue diseases	39
Active systemic lupus erythematosus/ cutaneous lupus erythematosus	*25*
Linear morphea	*11*
Mixed connective tissue disease	*1*
Lupus panniculitis	*1*
Systemic sclerosis	*1*
Psoriasis	**215**
Cutaneous adverse drug reactions	**130**
Stevens-Johnson Syndrome (SJS)	46
Acute generalized exanthematous pustulosis (AGEP)	18
Erythema Multiforme (EM)	18
Drug Rash with Eosinophilia and Systemic Symptoms (DRESS syndrome)	14
Maculopapular Eruption (MPE)	13
Fixed Drug Eruption (FDE)	7
Toxic Epidermal Necrolysis (TEN)	5
Angioedema	4
Toxic Erythema	2
Lichenoid dermatitis	2
Anaphylaxis	1
Inflammatory dermatoses	**86**
Urticaria	15
Hydradenitis suppurativa	13
Pyoderma gangrenosum	7
Alopecia	7
Erythema nodosum	6
Acne	6
Pityriasis rosea	5
Netherton syndrome	5
Darier disease	4
Sweet syndrome	3
Others like subcorneal pustular dermatosis, granulomatous cheilitis, pityriasis lichenoides et varioliformis acuta, Behcet disease, lipodermatosclerosis, erythema induratum of Bazin, paraneoplastic dermatoses (necrolytic migratory erythema), pityriasis rubra pilaris, granulomatous disease, infective vasculitis etc	15
Non Inflammatory/Benign tumour	**12**
Venous Insufficiency	3
Others (melanonychia, fibrokeratoma, patch test for observation, seborrheic keratosis, melasma, neurofibromatosis, sebaceous cyst)	9

Table 4. The detailed diagnosis of Infective dermatoses that were managed in Dermatology ward Hospital Kuala Lumpur between 2016-2020

Type of infective dermatoses	n=654
Bacterial infections	**378**
Cellulitis	215
Infected ulcer	62
Infected stasis eczema	41
Abscess	12
Infected lymphostasis verrucosa cutis	9
Ecthyma	7
Furunculosis	5
Folliculitis	4
Impetigo	3
Infected Biopsy Wound	3
Infected Wound	3
Syphilis	2
Thrombophlebitis	2
Infected pressure sore	2
Others (actinomycosis, bullous impetigo, paronychia, gangrene, infected bursitis, genital ulcer, gonorrhoea, erysipelas)	8
Fungal infections	**113**
Intertrigo	41
Tinea	36
Onychomycosis	17
Candidiasis	12
Sporotrichosis	3
Chromoblastomycosis	2
Pityriasis versicolor	1
Eumycetoma	1
Viral infections	**105**
Eczema herpeticum	30
Herpes Zoster	29
Genital herpes	27
Herpes Simplex	11
Viral Wart	4
Varicella zoster	1
Hand Foot Mouth Disease	1
Viral Exanthem	2
***Mycobaterium* infections**	**35**
Leprosy	32
Mycobacterium other than tuberculosis	2
Cutaneous tuberculosis	1
Parasite infections	**23**
Scabies	21
Head Lice	1
Elephantiasis	1

Discussion

In-patient care is crucial for a small cohort of patients with severe and extensive skin diseases when topical treatment is complicated. Inpatient admission allows regular clinical and laboratory monitoring, parenteral therapies, advanced nursing care and multispecialty referrals.[2] These include those with blistering diseases (eg toxic epidermal necrolysis/ Stevens-Johnson Syndrome, pemphigus, bullous pemphigoid), those who are frail and disabled as well as those with systemic involvement (eg connective tissue diseases, drug reaction eosinophilia with systemic symptoms, cutaneous vasculitis) who require close monitoring.

Patients who are ill with their underlying dermatosis complicated with a secondary infection will require intravenous antibiotics, pain management, intravenous fluids and nutritional support which is suboptimal when managed in an outpatient setting.[6] Intensive topical treatment and education in the ward will help to improve the disease severity.[7] Educational sessions including strategies to raise patient motivation are vital to maintaining improvement as shown by Masson Regnault et al.[7] In addition, drug allergy testing and drug provocation test which are laborious and time consuming could be performed comfortably in the dermatology ward in regions where allergy is a sub-specialty of interest under dermatology. If these patients do not develop systemic reactions during the tests, they could be discharged after close observation for 6-8 hours in the ward. Otherwise, observation could be extended overnight if reactions occurred during the tests.

Understanding the incidence of skin diseases is fundamental in making decisions regarding allocating resources for clinical care and research, especially with the introduction of the Malaysian Diagnosis Related Group (Malaysian DRG) in the Strategic Framework of the Medical Programme by the Ministry of Health (MOH) for the year 2021-2025.[8] Population-based studies are essential in this respect as an important platform to prepare healthcare system towards evidence-based budget allocation system. Our inpatient services encompass medical Dermatology only at present, not aesthetic or dermato-surgery. Our

study has a male to female ratio of 1.16:1 which is similar to that of Sen et al[2] in Eastern India and García-Doval et al[9] in Spain, in contrast to that of Bertanha et al[1] in Brazil, which has a lower male to female ratio, 1:1.72. Like Sen et al[2] and Bertanha et al[1], the mean age in our study of 45.04±18.79, which is much younger than that of García-Doval et al[9] and Krisner et al[10] in the United States. This could be explained by the pattern of dermatoses that contributed to the hospitalization. The prevalence of cutaneous malignancies is more prevalent with advanced age. The inpatient dermatology unit in García-Doval et al[9] and Krisner et al[10] comprises of dermato-surgery, photochemotherapy and skin grafting which cater more to cutaneous malignancy. Specialized dermatology-related procedures like photopheresis, total skin electron beam therapy, Mohs micrographic surgery, skin grafting surgeries, etc are yet to be expanded in our setting.

Like other studies shown in Table 5, the main reasons for hospitalization in our cohort were non-infective dermatoses followed by infective dermatoses. Eczematous dermatosis was the most common indication of admission. This was similar to that in Brazil, Australia and South Africa wherein eczema or dermatitis accounted for 17.5-46.6% of the dermatology in-patient care. This is in contrast with García-Doval et al[9] where 36% of inpatients were surgical dermatology cases. Inpatient management of atopic dermatitis is effective in improving disease severity and should be considered an important treatment option for patients with severe atopic dermatitis.[7] Only about 1% of our patients were admitted for cutaneous malignancy, far lower than the Spain[9] and Brazil[1] data. Most of the advanced cutaneous malignancies in HKL were managed at the Department of Plastic and Reconstruction as well as the Department of Oncology.

Infective dermatoses was the second most common dermatoses in our cohort. This is consistent with other studies i.e. Sen et al[2] in India, García-Doval et al[9] in Spain, Krisner et al[11] in the US. Drug-induced dermatosis is the second most common cause of admissions after eczematous dermatosis and papulosquamous disease for Jessop et al[11] in South Africa and García-Doval et al[9] in Spain.

Our cohort has the shortest length of stay of 4.82±4.60 compared to other cohorts. Most patients experienced short-term benefits from inpatient care and were discharged well. The in-patient care services in medical dermatology i.e. the setting up of a designated dermatology ward could be expanded to other dermatology centers in Malaysia.

The limitation of our study was stemmed from the nature of the data source. We could not assess the complexity of each admission as well as the determining factors of the length of stay. Our patients may have suboptimal control of co-morbidities or develop complications from the treatment which resulted in a prolonged stay in the ward. The treatment modalities and procedures done during admission were also not captured from the admission book. Future audits on Dermatology inpatients should focus on the aspects mentioned above as well as the cost of inpatient Dermatology care.

Conclusion

The Dermatology ward HKL managed 2292 admissions between 2016 and 2020. The three main dermatological diagnoses requiring intensive skin management were eczematous conditions, cutaneous infections and autoimmune blistering diseases. Standalone dermatology inpatient services may be expanded to other Department of Dermatology of major public hospitals in Malaysia.

Conflict of Interest Declaration

The authors have no conflict of interest to declare.

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Table 5. Comparison of international data on Dermaology In-patient

Study, year, Country	No of patients	M:F ratio	Mean age (years)	Diagnosis requiring admission	Average length of stay (days)	Outcome
Current study, Malaysia	1567	1.16:1	45.04±18.79	Eczematous dermatoses 35.8%, autoimmune dermatoses 18.0%, psoriasis 8.1%, bacterial infection 14.2%, drug induced dermatoses 4.8%, fungal infection 4.1%, viral infection 3.9&, malignancy 1.2%	4.82±4.60	Discharged 97.3% Transfer of care (2.7%)
Sen et al[1] 2016 Eastern India	375	1.66:1	45.5±2	Immunobullous disorders 24.3%; Erythroderma/ Dermatitis 26.7%; infective disorders 19.5%; drug reaction 10.7%; CTD 3.2%; Malignancy 0.53%	22.16±15.73	Discharged 83.2% Transferred of care 2.13%
de Paula Samorano-Lima et al[12] 2014, Brazil	3308	1:1.14	42.8±23.6	Eczema/dermatitis (17.5%), cutaneous infections (15.9%), immunobullous diseases (11.0%), connective tissue diseases (9.6%), psoriasis (9.2%).	13	3.7% transferred to ICU, 2.5% died
Bale et al[13] 2014, Australia	97	1.27:1	42	Dermatitis or eczema (37%), ulcers (12%)	10	N/A
Bertanha et al[1] 2016 Brazil	16,399	1:1.72	43.9±22.1	Eczematous dermatoses 18.1%; cutaneous infection 13.1%; erythematous squamous dermatosis 6.9%; malignancy 6.1%	N/A	No mortality
I García-Doval et al[9] 2002 Spain	1048	1.05:1	66	neoplasm 36%; infection 15%; psoriasis 10%; dermatitis 6%; drug reaction 5%	7(5-10)	0.76% mortality
Jessop S et al[11] 2002 South Africa	133	N/A	34.1	Atopic dermatitis 33.1%; Other forms of dermatitis 13.5%; Psoriasis 15.8%; Severe drug reactions 7.5%; Leg ulcer5.3%; Skin infection 5.3%; Bullous disease 4.5%	N/A	N/A
Kirsner et al[10] 2000 US	345	NA	60.7	Psoriasis (25%), chronic wounds (23%), dermatitis (11%), infections or infestations (10%), connective tissue diseases (9%), Immunobullous diseases (7%), drug reaction (3%)	6.1±0.2	NA

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