Inpatient Dermatology: Characteristics of Patients and Admissions in a Tertiary Level Hospital in Eastern India

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Abstract
Introduction: Dermatology is primarily a non-acute, outpatient-centered clinical specialty, but substantial number of patients need indoor admission for adequate management. Over the years, the need for inpatient facilities in Dermatology has grown manifold; however, these facilities are available only in some tertiary centers. Aims and Objectives: To analyze the characteristics of the diseases and outcomes of patients admitted in the dermatology inpatient Department of a tertiary care facility in eastern India. Materials and Methods: We undertook a retrospective analysis of the admission and discharge records of all patients, collected from the medical records department, admitted to our indoor facility from 2011 to 2014. The data thus obtained was statistically analyzed with special emphasis on the patient’s demographic profile, clinical diagnosis, final outcome, and duration of stay. Results and Analysis: A total of 375 patients were admitted to our indoor facility during the period. Males outnumbered females, with the median age in the 5th decade. Immunobullous disorders (91 patients, 24.27%) were the most frequent reason for admissions, followed by various causes of erythroderma (80 patients, 21.33%) and infective disorders (73 patients, 19.47%). Other notable causes included cutaneous adverse drug reactions, psoriasis, vasculitis, and connective tissue diseases. The mean duration of hospital stay was 22.2±15.7 days; ranging from 1 to 164 days. Majority of patients (312, 83.2%) improved after hospitalization; while 29 (7.73%) patients died from their illness. About 133 patients (35.64%) required referral services during their stay, while 8 patients (2.13%) were transferred to other departments for suitable management. Conclusion: Many dermatoses require inpatient care for their optimum management. Dermatology inpatient services should be expanded in India to cater for the large number of cases with potentially highly severe dermatoses.

Key Words: Admission, dermatology, India, inpatient

Introduction
Dermatology is primarily an outpatient-oriented specialty, most of the skin diseases being associated with variable morbidity but low mortality. However, there are several dermatological disorders which are severe enough to mandate inpatient admission. There are several ways in which these patients may benefit from hospital admission. Seriously ill patients may need regular clinical and laboratory monitoring, parenteral therapies, advanced nursing care and multispecialty referral for their condition which is only possible in an inpatient setting. Absence of domestic pressures and opportunities for the patients for gaining skills needed to manage their condition themselves in future are additional advantages.[1] There is evidence for significant improvement in measures of quality of life, depression, and anxiety following hospitalization for skin disease.[2,3] Till date, most of the studies concerning dermatology inpatient admissions hail from the western world, where psoriasis, bullous disorders, chronic ulcers, and dermatitis constitute about 70% of the inpatients.[4-6] In comparison, immunobullous disorders, infections, and

What was known?
Several dermatological conditions are severe enough to merit inpatient admission for proper investigation and management. The relative frequency of different diseases requiring inpatient care may vary in different geographic regions.
drug reactions are the most common causes of inpatient admissions in this part of the globe.[7-9] We undertook this study to ascertain the characteristics of indoor admissions and the patterns of disease and their outcome at a tertiary care center in eastern India. Dearth of studies addressing inpatient dermatology in India has prompted us to embark on this work.

Materials and Methods
We conducted a retrospective analysis of admissions and discharge records of all patients admitted during 2011–2014. The data obtained were analyzed statistically focusing mainly on the demographic profile of patients, clinical diagnosis, type of complications, referrals made to other departments, duration of hospital stay, mortality, and final condition of patient at the time of discharge. All the data have been preserved for future reference.

Results and Analysis
A total of 375 patients were admitted under our departmental care from 2011 to 2014. The major reasons for admission were severe disease with potential mortality, lack of response to outpatient management, and need for nursing care.

Demographics
In our study, male patients (62.2%) outnumbered female patients (37.5%). The mean age was calculated to be 45.5 ± 2 years, ranging from 6 to 90 years. Most patients came from the city of Kolkata and the adjoining rural districts.

Clinical diagnoses
Diagnoses were assigned to one of the following ten categories: Immunobullous disorders, psoriasis, erythroderma, infections, cutaneous adverse drug reactions, eczema/dermatitis, vasculitis, connective tissue disorders, malignancies, and miscellaneous dermatoses. Immunobullous disorders (91 cases, 24.27%) comprised the most frequent cause of admission followed by various causes of erythroderma (80 cases, 21.33%) and different infective disorders (73 cases, 19.47%). Pemphigus vulgaris, bullous pemphigoid, and pemphigus foliaceus were the most common immunobullous disorders (in order). About 40% of the cases of erythroderma were idiopathic in nature. Leprosy (43 patients) comprised 39% of the infectious disease group followed by postkala azar dermal leishmaniasis (PKDL) (49 cases, 37%). Remainder of the infectious diseases group consisted of 2 patients of severe cellulitis and one patient of rhinoscleroma. Almost all leprosy patients (40) were admitted for reactions (Type 2 > Type 1). Three patients were admitted for multidisciplinary management of trophic ulcers. PKDL patients were admitted for detailed evaluation and administration of liposomal amphotericin B. The mean duration of stays for leprosy and PKDL patients were 21.3 days and 22.4 days, respectively. All the clinical diagnostic groups along with percentage of patients affected are tabulated [Table 1].

Complications and referrals
About 25.5% of our patients developed at least one complication during their hospital stay, while 133 (35.46%) patients had to be referred to other departments for their optimum management [Table 2].

Final outcome
The final outcome following hospital stay was satisfactory; majority of the patients improved, and they have been advised regular follow-up at our outpatient department (312, 83.2%); 19 (5.07%) patients left against medical advice, 8 (2.13%) patients had to be transferred out to ICU and other departments for effective management. Despite our best efforts, 29 (7.46%) patients died. Highest mortality (17, 58.62%) occurred in patients

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**Table 1: Clinical diagnoses with percentage of patients affected (n=375)**

| Clinical diagnosis (category of disease) | n (%) of patients affected (n=375) |
|----------------------------------------|------------------------------------|
| Immunobullous disorders                | 91 (24.27)                         |
| Erythroderma                           | 80 (21.33)                         |
| Infective disorders                    | 73 (19.47)                         |
| Cutaneous adverse drug reaction        | 40 (10.67)                         |
| Dermatitis                             | 20 (5.33)                          |
| Psoriasis                              | 15 (4)                             |
| Vasculitis                             | 15 (4)                             |
| Connective tissue disease              | 12 (3.2)                           |
| Miscellaneous (leg ulcer, urticaria, Darier's disease etc.) | 27 (7.2) |
| Malignancy                             | 2 (0.53)                           |

**Table 2: Percentage of patients requiring referral to other departments (n=133)**

| Name of department         | n (%) of patients referred (n=133) |
|----------------------------|------------------------------------|
| General medicine           | 65 (48.87)                         |
| Ophthalmology             | 27 (20.30)                         |
| Physical medicine and Rehabilitation | 11 (8.27) |
| General Surgery           | 7 (5.26)                           |
| Pulmonology               | 6 (4.51)                           |
| Orthopaedics              | 6 (4.51)                           |
| Psychiatry                | 3 (2.26)                           |
| Dental                    | 2 (1.50)                           |
| Otorhinolaryngology       | 2 (1.50)                           |
| Intensive care unit       | 2 (1.50)                           |
| Paediatrics               | 1 (0.75)                           |
| Gynaecology and obstetrics| 1 (0.75)                           |
suffering from immunobullous disorders. Septicemia was the leading cause of death (13 patients, 44.83%) overall. The cause of death and the final diagnoses of deceased patients are shown in Table 3.

**Duration of stay in hospital**

The duration of hospital stay ranged from 1 day to 164 days; the mean duration being 22.16 ± 15.73 days. The duration of stay along with the referral and mortality rates of patients belonging to different diagnostic categories has been tabulated [Table 4].

**Discussion**

We analyzed the records of 375 patients, spanning over 4 years (2011–2014). The majority (62%) of our patients were males, who were mostly in their fifth decade. Similar male preponderance was noted in an Australian study, while a Nepalese study showed female preponderance. The mean age of our patients (45.5) was similar to the findings reported from Iran (44 years), whereas it was higher when compared to the findings of studies from Nepal (35.5 years) and South Africa (34.1 years). Where as a higher mean age of about 53 years, was reported from greater Manchester, UK.

The most common cause of admission in our study was immunobullous disorders (91 patients, 24.27%), followed by various causes of erythroderma (80 patients. 21.33%) and different infective disorders (73 patients, 19.47%). Pemphigus vulgaris was the most common immune-bullous disorder, accounting for almost 46% of the cases of this group. Bullous pemphigoid and pemphigus foliaceus were the other two notable immune-bullous disorders. Immunobullous disorders was also the most common cause of admission in Iran and fourth most common cause in the USA; however, it was pretty uncommon in a Spanish hospital. Erythroderma was the second most common cause of admission in our study. Psoriasis and dermatitis accounted for most of these cases. Infections were the third most common cause of admission in our series (19.47%). Leprosy, mainly reactional forms, was the most frequent infective disorder, followed by PKDL. Infective conditions were the most frequent cause of indoor admission in Pakistan, while those accounted for 15.9% of admissions in Brazil; 8.3% of admissions in Nepal, and 3.74% in Iran. Cutaneous adverse drug reactions (Stevens–Johnson syndrome - toxic epidermal necrolysis [TEN], drug hypersensitivity syndrome, exanthematous reaction) accounted for 10.67% of admission in our study whereas it was most important cause of admission at Nepal (21.6%). While psoriasis, dermatitis, skin cancers, and leg ulcers comprised the most common causes of admission in western countries, these conditions accounted for lesser number of admissions in our study. Our findings are shown in Table 1.
About 25.5% of our patients developed some form of complications during their hospital stay, while 35.6% of our patients had to be referred to at least one specialist department for management of their disease complications and comorbidities. This rate of referral is much lower than that reported by an Australian study (92%).[10] Most referrals were made to the department of internal medicine (48.87%) followed by the department of ophthalmology (20.30%) [Table 2].

The mean duration of hospital stays for our patients ranged from 1 to 164 days (mean 22.16 ± 15.7). The details are shown in Table 3. About 107 patients (28.55%) stayed for <2 weeks, while 92 patients (24.5%) had to stay for more than a month. The mean duration of hospital stay was much higher when compared to the inpatients of Brazil (13 days),[11] Australia (10 days),[11] and the USA.[11] The longer duration of stay for our patients is mainly explained by the most frequent reasons of admission: Immunobullous diseases and erythroderma, conditions requiring a relatively long duration of treatment for induction of remission or significant improvement.

Overall, the outcome of admitted patients was satisfactory, the mortality rate being 7.73% (29 patients) [Table 4]. An Indian study specifically looking into the mortality in dermatology inpatients had recorded a mortality rate of 3.8%. Majority of the cases were accounted for by immunobullous disorders and TEN. The death rate among our patients was highest among patients with immunobullous disorders (58.62%) followed by drug reactions and different forms of erythroderma (17.24% each). The most common cause of death was found to be septicemia (44.83%) followed by cardiorespiratory complications (41.38%) and renal impairment (13.79%). Advanced stage of disease at the time of admission and multiple comorbidities probably accounted for this high mortality rate in these patients. Most (83.2%) patients benefitted from inpatient care and they were advised regular outpatient follow-up, while 8 (2.13%) patients had to be transferred to other departments for their co-morbidities. These figures are comparable to previous studies.[10,12]

**Conclusion**

Patients with several dermatological conditions require inpatient admission for severity of their disease and comorbidities. The conditions requiring admission vary from one geographic region to another. Since many of the diseases are chronic in nature, they may require prolonged hospital stay. Most of the admitted patients can benefit from inpatient care. Thus, there is a need for expansion of specialized dermatological inpatient facilities.

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**Conflicts of interest**

There are no conflicts of interest.

**What is new?**

Immunobullous disorders, erythroderma, and infections were the most frequent conditions requiring inpatient care in our patients. About one-third of the patients needed referral to other departments. While there were some mortalities, the majority of the patients significantly benefitted from indoor treatment.

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