THE CLINICAL SPECTRUM AND OUTCOME OF SKIN CONDITIONS IN PATIENTS ADMITTED TO DERMATOLOGY WARDS AT KING EDWARD VIII HOSPITAL, DURBAN.

By

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Declaration

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Overview of the thesis

Background

Dermatology is primarily an outpatient speciality, but significant numbers of patients are admitted either for inpatient treatment or diagnostic work up in dermatology wards. Reviews of inpatient dermatology admissions are limited in the current medical literature. In our setting, no studies have been conducted to evaluate the clinical spectrum and outcome of dermatology inpatients.

Purpose of the study

The purpose of the study was to describe the clinical spectrum and outcome of inpatients admitted to dermatology wards at King Edward VIII Hospital in Durban, KwaZulu-Natal.

Methods

We performed a retrospective study of records of patients admitted to dermatology wards between January 2012 and December 2013. Records were analyzed for age, gender, length of stay, dermatologic disease, investigations and discharge plan.

Results

A total of 108 patients' charts were reviewed. Of the admissions 52.8 % (n=57) were female and 47.2% (n=51) were male. The mean age was 34 (range 1-79 years). The average length of stay was 9 days, with a median of 7 days. The most common diagnoses made were Steven Johnson Syndrome and atopic dermatitis at 19, 4% and 12, 0% respectively. Other skin conditions included autoimmune blistering dermatoses (6.5%), psoriasis (5.6%), extensive viral infections (5.6%), deep fungal infections (5.6%), Steven Johnson Syndrome-Toxic Epidermal Necrolysis Overlap (SJS-TEN) Syndrome (4.6%), sebo-psoriasis (4.6%), Kaposi sarcoma (2.8%), severe bacterial infections (0.9%), mycosis fungoides (0.9%) and HPV (0.9%).

The investigations that were retrievable from the charts of our patients (adults and children) included FBC/Diff (99%), U&E/LFT (97%), CXR (98%), HIV (35%), biopsy (23%), sputum for AFB (1.9%) and PCT (1.9%). Ninety eight percent of patients had a Chest X-ray recorded in their charts. It was documented in the charts that the Chest X-ray was done as a screening test for pulmonary TB owing to the high prevalence of both HIV and tuberculosis in our setting.

Of all the admissions, 85% (n=92) were discharged and given a follow up date, 6% (n=6) were referred to other departments and 9% (n=10) died

Conclusion

The two-year retrospective study, documented the spectrum and outcome of skin conditions in patients admitted to dermatology wards at King Edward VIII Hospital, Durban.

Stevens Johnson Syndrome and atopic dermatitis were the most common reasons for admission. It is important that outpatient management and early diagnoses is optimized to avert costly and unnecessary admissions, thereby reducing morbidity and mortality which may be triggered by nosocomial infections. Timeous referral is key to the positive outcome and this can be achieved by educating primary health caregivers to identify and refer relevant cases promptly.

LIST OF ABBREVIATIONS

AD= Atopic Dermatitis

Seb derm= Seborrhoeic dermatitis

FBC= Full Blood Count

Diff= Differential count

U&E= Urea and Electrolytes

LFT= Liver Function Test

PCT= Procalcitonin

CXR= Chest X Ray

SJS= Steven Johnson Syndrome

TEN= Toxic Epidermal Necrolysis

SJS-TEN= Steven Johnson Syndrome-Toxic Epidermal Necrolysis Overlap

DERMATITIS NOS= Dermatitis Not Otherwise Specified

PRP =Pityriasis Rubra Pilaris

HPT= Hypertension

DM=Diabetes Mellitus

HIV= Human Immune Deficiency Virus

AIDS=Acquired Immune Deficiency Syndrome

QOL= Quality of Life

1. Table of Contents

CHAPTER 1

INTRODUCTION

Durban is the largest city in the province of KwaZulu-Natal, South Africa with a population of 3.012 million people (Statistics South Africa 2014). King Edward VIII Hospital which is one of the main referral tertiary centres in Durban serves most of the KwaZulu-Natal province including south and north coast. King Edward VIII Hospital has 12 out of 922 beds dedicated to dermatology inpatient care and has a busy outpatient department seeing roughly 100 outpatients per day.

The socio-economic status of the people in KwaZulu-Natal is variable with some covered by medical insurance (20%) and 80% serviced by the public sector. The majority live in low-cost or subsidized housing or in informal housing settlements with local public clinics and district hospitals providing most of the primary health care. Specialist dermatology care is available on a referral basis to all outlying clinics. However, the waiting lists are generally long averaging about 8-12 weeks waiting time and patients may need to travel several hundred kilometres to reach a tertiary referral hospital.

According to dermatology outpatient' statistics at King Edward VIII Hospital, on average 19 000 to 20 000 patients are seen in dermatology outpatient clinic per annum. Approximately 120 patients get admitted to a dermatology ward per annum including both children and adults. The reasons for admission are either for disease control or for diagnostic work up. To our knowledge, the spectrum and outcome of admitted patients have not been documented before in KZN.

Dermatology is primarily an outpatient speciality in which inpatient service has traditionally played a small but nevertheless a significant part in the overall management of patients. Reviews of inpatient dermatology admissions are limited in the current medical literature.

Patients with skin diseases may benefit from hospital admission in one of several ways. The small proportion of seriously ill dermatology patients benefit from careful monitoring of their dermatoses and therapy (Samorano-Lima *et al* 2014). Patients with extensive or recalcitrant/chronic illnesses benefit from good and optimal nursing care (Samorano-Lima *et al* 2014).

Additional advantages are the absence of domestic pressures and the opportunity to gain the skills to manage their condition themselves at home (Jessop *et al* 2002). Measures of depression, anxiety, and overall quality of life have been shown to improve significantly in patients admitted to hospital for skin conditions (Garcia-Doval *et al* 2002).

Some of the skin conditions are relative indications for admission, influenced by social and community circumstances, level of education, and personal financial status (Samorano-Lima *et al* 2014). With acceptable and reasonable circumstances and available transport to day-care or outpatient departments, many patients can be treated in the community (Samorano-Lima *et al* 2014). Others, however, cannot benefit from these services by virtue of their concomitant psychosocial, medical, or financial difficulties (Garcia-Dovel *et al* 2002).

Inpatient treatment plays a fundamental role in the management of complex and severe dermatological disease (Bale *et al* 2014).

In this study, our aim was to describe the spectrum and outcome of dermatology inpatients at King Edward VIII Hospital in KwaZulu-Natal, South Africa.

LITERATURE REVIEW

Dermatology is primarily an outpatient clinical and surgical speciality, but it plays an important role in the care of inpatients who are admitted to dermatology beds. Few skin diseases are life-threatening, but some cause major disabilities, and many result in loss of productivity and impaired quality of life (QOL) (Samorano-Lima *et al* 2014).
Inpatient management has previously been recognized to be highly effective in remitting acute and chronic skin disorders and to have significant beneficial effects on QOL (Bale *et al* 2015).

Data on inpatient dermatology care in South Africa is scarce. Most studies on inpatient dermatology come mainly from the USA and UK.

In a study that was done by Mosam et al in KwaZulu-Natal between 1995 and 2001, to assess and compare the HIV frequency, demography and disease spectrum, the majority of admissions in the HIV positive group were for, in order of frequency, seborrheic dermatitis, psoriasis, drug eruptions, and erythroderma.

In a study that was done in Cape Town by Jessop *et al* (2002), most admissions to a tertiary dermatology unit were for extensive psoriasis or dermatitis. Drug reactions also appeared to be a more common indication for admission. The most common diagnosis on admission was atopic dermatitis (33.1%), followed by psoriasis (21.8%), other types of dermatitis (13.5%), and drug reactions (8.3%). Severe illness was the reason for admission in 15% of patients, the most common diagnoses in this group being drug reactions and bullous diseases.

A study in Scotland and northern England highlighted the need for and potential benefits from dermatology admission in the well-resourced world. The needs in developing countries are likely to be much greater. Patients tend to present to doctors at a later stage, with more severe disease (Jessop *et al* 2002). Lower educational level, lower income and less adequate housing tend to render outpatient care less satisfactory (Jessop et al 2002). In addition, the burden of major infectious diseases, in particular Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS), complicates both the pattern of disease and its therapy (Garcia-Doval *et al* 2002).

In a study that was done by Munro *et al* (1999) in Scotland and Northern England to assess the value of inpatient dermatology, seven diagnostic groups were identified. Psoriasis included both acute and chronic forms and eczema included atopic and other forms.
Leg ulcers and autoimmune blistering dermatoses were self-evident. The neoplasia group included patients admitted for surgery or chemotherapy, and cutaneous lymphoma. The infection group included viral as well as bacterial infections, e.g. eczema herpeticum and cellulitis. The remaining group included drug erythemas, vasculitis, urticaria, pruritus and miscellaneous conditions. In that study psoriasis accounted for 48% of admissions and 58% of in-patient days. Eczema and leg ulceration accounted for another quarter of in-patient days, with the remaining four groups each accounting for about 6%.

Helbling *et al (*2002) in Great Manchester found that Psoriasis (41%), eczema (33%) and leg ulcer (5%) were the most frequent diagnosis on admission.

Garcia-Doval *et al* (2002) conducted a study in inpatient dermatology patients in one of the Spanish Hospitals. They found that surgery was the reason for admission in 37% of inpatient dermatology patients. The most frequent diagnoses were; neoplasms (36%), infections (15%), psoriasis (10%), other (10%), dermatitis (6%) and drug reactions (5%). Readmission rates were 1.8% within 30 days, and 12.5% within 1 year.

In a study that was done in Brazil by Samorano-Lima *et al* (2014), the most frequent causes of admission were dermatitis (17.5%), cutaneous infections (15.9%), immunobullous diseases (11.0%), connective tissue diseases (9.6%), and psoriasis (9.2%).

In all studies, the extent of skin involvement was given as the main indication for admission, although psychosocial problems and lack of home and day clinic facilities were contributing factors. Some patients, particularly in the elderly age group, had concomitant major medical problems (Munroe *et al* 1999).

The objective of this study was to describe the spectrum and outcome of dermatology inpatients at King Edward VIII Hospital in KwaZulu-Natal, South Africa. This is important so as to direct continuing medical education to those conditions as well as inform policy makers as to resource allocation.

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CHAPTER 2

The clinical spectrum and outcome of skin conditions in patients admitted to dermatology wards at King Edward VIII Hospital, Durban: a 2-year retrospective r e v i e w .

Prepared according to the instructions for authors of SAMJ

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Background. Dermatology is primarily an outpatient speciality, however the patients admitted to hospital either for inpatient treatment or diagnostic work up are severely ill. The HIV epidemic has changed the face of dermatology clinics and wards. Since the rollout of antiretroviral therapy in 2004, no studies have been conducted in dermatology wards in South Africa to investigate the clinical spectrum and outcome of dermatology inpatients.

Objective. To describe the clinical spectrum and outcome of dermatology inpatients admitted to dermatology wards at King Edward VIII Hospital in Durban, KwaZulu-Natal.

Methods. We performed a retrospective study of records of patients admitted to dermatology wards between January 2012 and December 2013. Records were analyzed for age, gender, length of stay, dermatologic disease, investigations and discharge plan.

Results. A total of 108 patients' charts were reviewed. The top two commonest admission diagnoses were Steven Johnson Syndrome (SJS) and atopic dermatitis at 19, 4% and 12, 0% respectively. Other admission diagnoses included autoimmune blistering dermatoses (6.5%), psoriasis (5.6%), severe viral infections (5.6%), deep fungal infections (5.6%), Steven Johnson Syndrome-Toxic Epidermal Necrolysis Overlap (SJS-TEN) Syndrome (4.6%), sebo-psoriasis (4.6%), Kaposi Sarcoma (2.8%), severe bacterial infection (0.9%), mycosis fungoides (0.9%) and HPV (0.9%). The average length of stay was 9 days, with a median of 7 days.

Conclusion. In this 2 year, retrospective study, we documented the spectrum and outcome of skin conditions in patients admitted to dermatology wards at King Edward VIII Hospital, Durban. Stevens Johnson Syndrome and atopic dermatitis were the commonest admission diagnoses. It is important that the management of these conditions is optimized. This may prevent some cases from being admitted and for those admitted improve morbidity and mortality. Timeous referral is key to the positive outcome of these patients.

Background

Durban is the largest city in the province of KwaZulu-Natal, South Africa with a population of 3.012 million people (Statistics South Africa 2014). King Edward VIII Hospital is the second largest hospital in the Southern hemisphere, providing regional and tertiary services to the whole of KwaZulu-Natal. King Edward VIII is a 922-bedded hospital with +/- 360 000 out patients. At least 12 of these beds are dedicated to dermatology.

According to dermatology outpatient' statistics at King Edward VIII Hospital, on average 19 000 to 20 000 patients are seen in dermatology outpatient clinic per annum. Approximately 120 patients are admitted to dermatology wards per annum. This includes both children and adults. They are either admitted for disease control or for a diagnostic work up. The spectrum and outcome of these admitted patients haven't been documented.

Dermatology is primarily an outpatient speciality in which inpatient service has traditionally played a small but nevertheless a significant part. Limited reviews of inpatient dermatology exist in the current medical literature.

The objective of this study was to describe the spectrum and outcome of dermatology inpatients at King Edward VIII Hospital in KwaZulu-Natal, South Africa during the HIV/AIDS era and after the rollout of antiretroviral therapy.

Methods

This was a retrospective review of patients' records. It consisted of records of all patients admitted to dermatology wards at king Edward VIII Hospital over a 2-year period from January 2012 until December 2013.
The study was conducted in the Dermatology wards of King Edward VIII Hospital in Durban, KwaZulu-Natal, South Africa. King Edward VIII Hospital is the second largest hospital in the Southern hemisphere, providing regional and tertiary services to the whole of KwaZulu-Natal. King Edward VIII is a 922-bedded hospital with +/-360 000 out patients.

A total of 108 patients' charts were reviewed.

Patient information was analyzed included age, gender, dermatologic disease, investigations, co morbidities, treatment, length of stay and discharge plan.

Ethical approval was obtained from the UKZN Biomedical Research Institutional Review Board (Ref. BE 221/15).
Data analysis was performed by the Division of Biostatistics, Medical Research Council South Africa and the results presented by means of frequencies & percentages for discrete data, and ranges, medians, means with standard deviations for continuous data.

Results

A total of 108 patients were admitted to King Edward VIII Hospital dermatology wards between January 2012 and December 2013. Of the 108 admissions 86 % (n=93) were adults and 14% (n=15) were children under the age of 12. The mean age was 34 (range 1-79 years).

Of the 93 adults 52% (n=48) were female and 48% (n=45) were male. Of the 15 children 60% (n=9) were female and 40% (n=6) were male.

Figure 1 (below): Adult patient admission by diagnostic groups. Diagnoses were made using the clinicians' assessment and biopsy where needed.

The most frequent causes for admissions were bullous drug reactions (39%), dermatitis not otherwise specified (11.8%), seborrheic dermatitis (10.7%), psoriasis (6.5%), severe viral infection (6.5%), sebo-psoriasis (5.4%), autoimmune blistering dermatoses (5.3%), deep fungal infections (5.3%), atopic dermatitis (4.3%), Kaposi Sarcoma (3.2%), mycosis fungoides (1.0%) and erythroderma (1.0%).

Of the bullous drug reactions, 58% (n=21) were SJS, 28% (n=10) were TEN and 14% (n=5) ere SJS-TEN overlap.

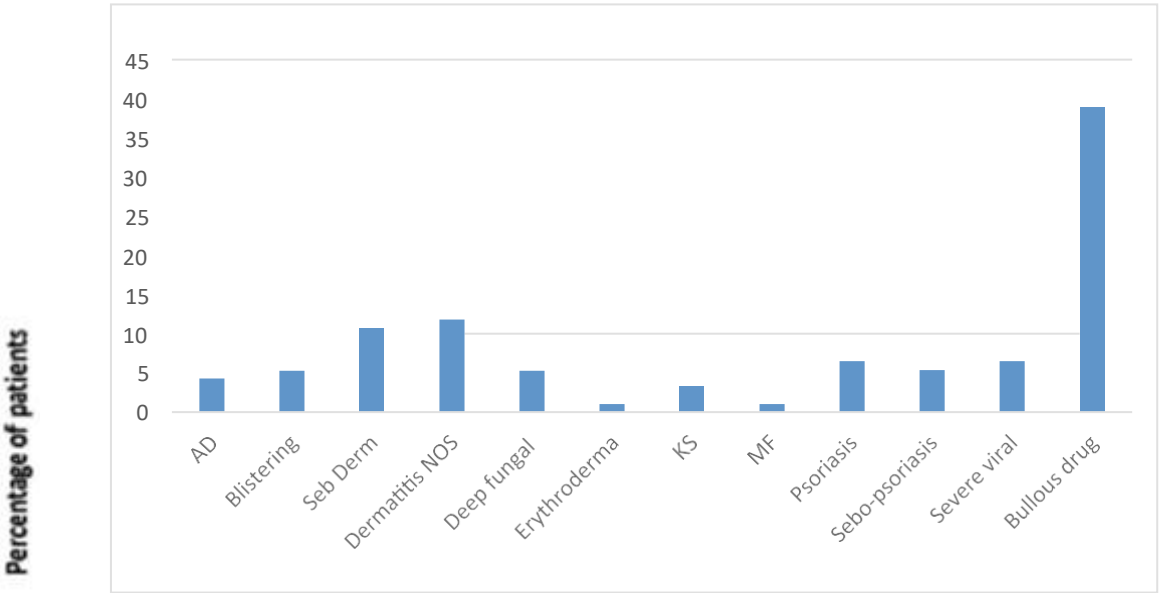
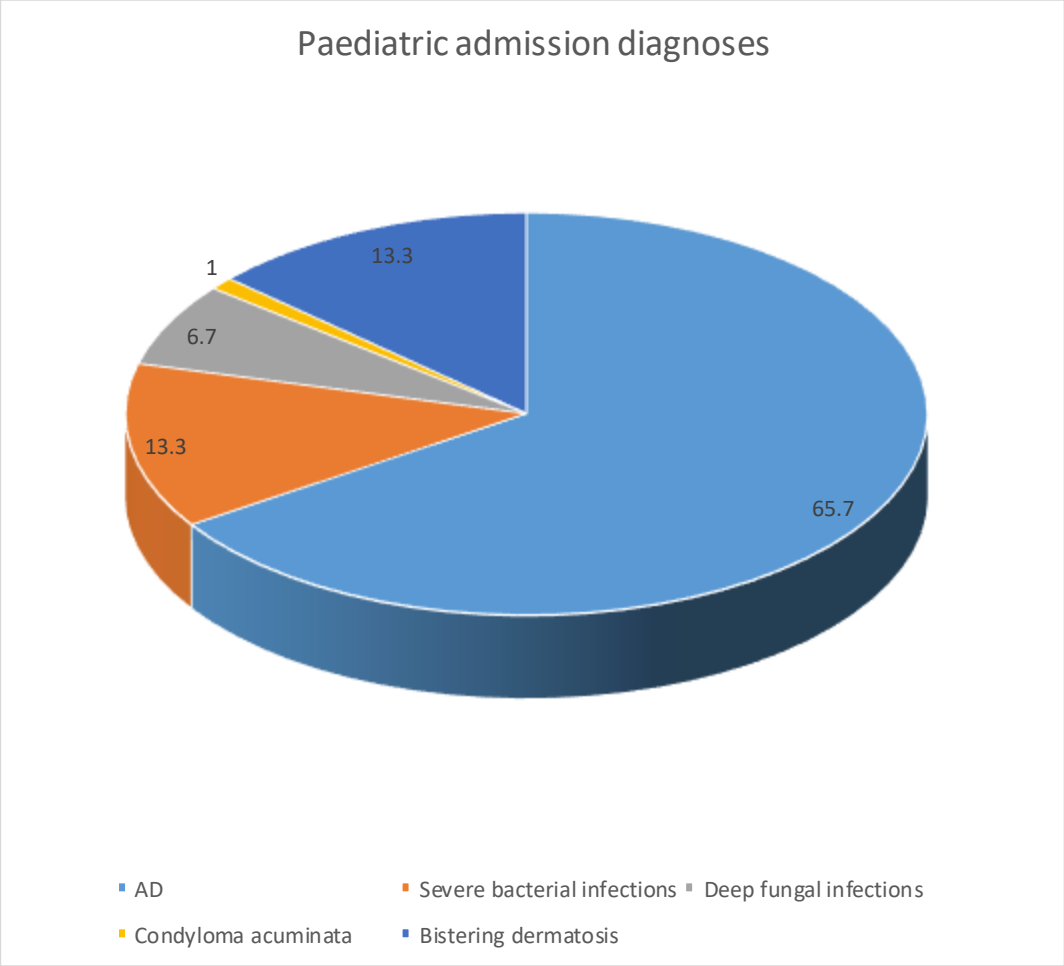


Figure 2 (below): Paediatric patient admission by diagnostic group

The most frequent causes for paediatric admissions to dermatology wards were atopic dermatitis (65.7%), severe bacterial infection (13.3%), blistering dermatoses (13.3%), deep fungal infection (6.7%) and condyloma acuminata (1.0%)

The clinical assessments and diagnosis were based on the ICD10 Coding System.



Investigations

The investigations that were done are summarized in table 1. Of the 108 patients admitted, 99% (n=107) had a full blood count (FBC), 97% (n=105) had renal and liver function tests (U&E and LFT), 98% (n=106) had a chest x-ray done, 35% (n=38) had an HIV test done, 23% (n=25) were biopsied, 1.9% (n=2) had sputum for TB done and 1.9% (n=2) had procalcitonin done.

Table 1. (Below): Investigations

Investigations	Numbers	Percentages
FBC/Diff	107	99
U&E/LFT	105	97
PCT	3	2.8
CXR	106	98
HIV Test	38	35
Biopsy	25	23
Sputum for TB	2	1.9

Co-Morbidities

A large number of patients had underlying co morbidities. Of all the patients with co morbidities, 53.7% (n=58) had an underlying HIV/AIDS, 6.5% had hypertension and 4.6% (n=5) had diabetes mellitus. The remaining 35.2% (n=38) had no known co morbidities. The results are summarized in figure 3.

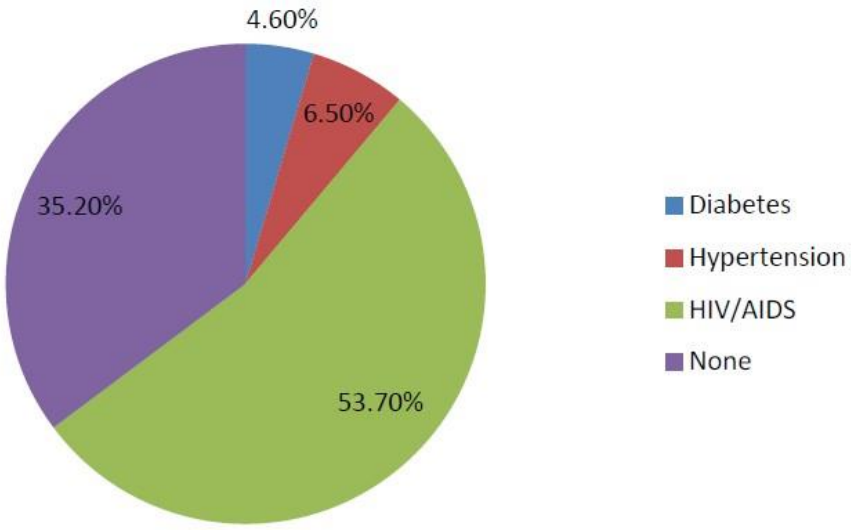


Figure 3 (above): Co-morbidities

Patient's outcomes

Of all the admissions, 85% (n=92) were discharged and given a follow up date, 6% (n=6) were referred to other departments and 9% (n=10) died. The mortality rate was 9.3%. Hundred percent of patients who died had bullous drug reactions. Among patients who died, the causes of death were septicaemia (50%) and acute respiratory distress syndrome (10%) as complications of bullous drug reactions. The actual cause of death was not documented in 40% of patients who died.

Discussion

Dermatology admissions to King Edward VIII Hospital are usually patients with either severe or complicated diagnosis. This is indicated by the large number of patients needing a follow up appointment with the dermatologist after discharge.

The Spectrum of Adult Skin Conditions

The study documented the highest number of adult admissions due to bullous drug reactions (39%), which can be explained by the number of patients living with HIV/AIDS in the province of KwaZulu-Natal as demonstrated by data from Department of health South Africa in 2007 that 25, 2% of HIV infected population lives in KwaZulu-Natal province. Of the bullous drug reactions, 58% were SJS, 28% were TEN and 14% were SJS-TEN overlap. The most frequent causes of bullous drug reactions were nevirapine (60%), Co-trimoxazole (32%) and efavirenz (8%).

South Africa has the largest ARV programme worldwide with at least 8 million currently on therapy. This is primarily funded by the government. At the initiation of the national ARV programme in 2004, the most common first line regimen contained nevirapine. The DOH guidelines changed in 2013 to a non-nevirapine containing regimen that is a fixed drug combination of efavirenz, tenofovir and emtricitabine. Many of the cases seen with bullous drug reactions were largely due to non-nucleoside reverse transcriptase inhibitors, especially nevirapine. However, even with the change in regimens due to the high rate of adverse cutaneous drug reaction and hepatitis with nevirapine, the study period still reflects the commonest admission diagnosis to be bullous drug eruptions.

The second commonest cause for admission was dermatitis NOS (11, 8%) which included dermatoses that were not mentioned in other categories. The significant number of this category can possibly be explained by the fact that it included many diagnoses that couldn't be classified as separate entities. These include cutaneous lupus, dermatomyositis, scleroderma, infected stasis eczema, erysipelas, leg ulcers and cutaneous T-cell lymphomas other than mycosis fungoides. Most patients with connective tissue diseases, leg ulcers and T-cell lymphomas were admitted for diagnostic work up. Patients with infected stasis eczema and erysipelas were admitted for intravenous antibiotics.

Seborrheic dermatitis was the third cause for admission constituting 10.7% of the cases. In our setting, this is frequently seen in HIV positive patients which explains the significant number of patients admitted with this diagnosis. Most of these patients were admitted with infected erythrodermic seborrheic dermatitis for antibiotic therapy and topicals.

Severe viral infections constituted 6.5% of all adult hospital admissions. This included herpes simplex virus and cytomegalovirus infections. Herpes simplex virus occurred as a superimposed infection mainly in patients with atopic eczema and erythroderma. There were two cases of cytomegalovirus infections which both occurred in HIV positive patients with a very low CD4 count.

Another commonly seen condition was psoriasis (6.5%). This encompasses all different types of psoriasis including RVD-related psoriasis which is also common in our setting owing to the high prevalence of HIV. Another frequent cause for admission was sebo-psoriasis (5.4%).

This could also be explained by the high prevalence of HIV. In our setting this condition is seen in HIV positive patients.

Other admission diagnoses included autoimmune blistering dermatoses (5.3%), deep fungal infections (5.3%), Kaposi Sarcoma (3.2%), mycosis fungoides (1.0%) and erythroderma (1.0%).

These data differ from other studies done in other countries. Prodanovich et al 2001, noted that the most frequent causes of admissions were psoriasis and chronic wounds, which together accounted for almost half (48.5%) of all admissions in their unit.

In a study that was done in Spain, Garcia-Doval et al 2002, observed that neoplasms (36%, including cutaneous lymphomas) and infection (15%) were the most frequent causes for the admission. The high prevalence of cutaneous infections was partially explained by the fact that the institution surveyed in the Spanish study admitted patients with acute medical dermatoses to its dermatology unit rather than dispersing them to other departments.

In a study that was done by Jessop et al (2002) in Cape Town, the commonest cause for admission was atopic eczema. This differs from our findings in adults which is bullous drug reactions. The study by Jessop et al (2002) was done before the antiretroviral rollout in South Africa, hence the low percentage of drug reactions.

The spectrum of Paediatric Skin Conditions

Most paediatric admissions to King Edward VIII Hospital were for atopic eczema (60%), severe bacterial infection (13.3%), blistering dermatoses (13.3%), HPV (6.7%) and deep fungal infection (6.7%). Similar to Jessop et al 2002, we found the predominance of atopic dermatitis to be high (60%). The predominance of atopic eczema is also similar to the results that were found by Bale et al 2013 in Australia, as atopic eczema is the commonest skin condition treated in most facilities.

The second most frequent causes for admission were blistering dermatoses and severe bacterial infection. The patients with blistering dermatoses were admitted mainly for a diagnostic work up and control of the disease, and those with severe bacterial infections which included staphylococcal scalded skin syndrome and bullous impetigo were admitted for intravenous therapy. There was one patient with an HIV related extensive condyloma acuminata involving 5% of the body surface area which was secondarily infected by staphylococcus aureus. The patient was admitted for potassium permanganate soaks, oral Co-amoxyclav 250mg three times a day for 7 days and imiquimod topically three times a week. One child was admitted with a diagnosis of a deep fungal infection for investigations and in-hospital treatment with amphotericin B.

Investigations

The investigations that were retrievable from charts of our patients (adults and children) included FBC/Diff (99% of patients), U&E/LFT (97%), CXR (98%), HIV (35%), biopsy (23%), sputum for AFB (1.9%) and PCT (1.9%). Ninety eight percent of patients had a Chest X-ray recorded in their charts. It was documented in the charts that the Chest X-ray was done as a screening test for pulmonary TB owing to the high prevalence of both HIV and tuberculosis in our setting.

Thirty five percent of patients had HIV test results recorded in their charts. These are the HIV test results that were done on admission. Of those HIV tests done on admission, fifty three percent were positive. Twenty three percent of patients had biopsy results in their charts.

Sputum for AFB records were found in two charts of patients who were suspected of having active pulmonary TB. Both their charts showed that they had symptoms suggestive of pulmonary TB. However, the sputum did not confirm TB in both cases. Three patients had procalcitonin results in their charts. The charts of these patients showed that they had temperature spikes which warranted investigations. However, the PCT values were normal in all those patients.

The average length of hospital stay was 9 days, with a median of 7 days. The diagnosis that accounted for the longest length of stay was in the dermatitis NOS group. The patient was in a dermatology ward for 32 days.
This was a patient who was admitted with a working diagnosis of pyoderma gangrenosum. He was admitted for a diagnostic work up which included biopsy, tissue culture and Doppler studies.

Co-morbidities

Our results further show that the greatest proportion (53, 7%) of patients have HIV/Aids as a comorbid condition. In relation to comorbidities, Tay et al (2014) conducted a retrospective study analyzing all inpatient dermatology referrals in a tertiary hospital in Singapore over a 1-year period and noted that hypertension and diabetes mellitus were amongst the most frequently identified comorbidities. This is in contrast with our findings which showed that diabetes constituted 4.6% whereas hypertension accounted for 6, 5% of the total comorbidities. The mean age of our study population was 34 years suggesting a possible explanation why diabetes and hypertension were not found to be the highest comorbidities in our study population, as these conditions tend to occur in the older population. The HIV epidemic affects younger males and females in our communities, hence accounting for the younger age of presentation of our patients. HIV is thus the commonest co-morbidity in our cohort and responsible for the majority of admissions such as bullous drug reactions, infections and erythroderma due to seborrheic dermatitis and psoriasis.

According to Jessop et al (2002), the contribution of HIV/AIDS to hospitalization in Cape Town was not addressed by their study. However, with a high and rising incidence of infection in South Africa, it is likely that this would contribute further to the need for admission in the future, and that this cohort of patients will tend to have more serious disease.

53, 7% of our inpatients had HIV/AIDS and evidence for an increased occurrence of severe drug reactions in people with HIV/AIDS has been reported as described by Jessop et al (2002). The high prevalence of HIV infection in our setting is directly responsible for the increased occurrence of Steven Johnson syndrome that constituted 19.4% of admission diagnoses. The commonest drugs implicated in the bullous drug eruption group in our study were nevirapine, efavirenz, bactrim and anti-tuberculous drugs especially isoniazid and rifampicin.

In terms of patient outcome, only 6% of the patients were referred to other facilities for continued management and 10 patients died. Nine of them had Steven Johnson syndrome and one had blistering dermatoses. This was at the era of the Nevirapine containing Anti-retroviral regimen that the South African national department of health was rolling out. This protocol has changed as nevirapine has been taken out of the anti-retroviral regimen.

Conclusions

In this 2 year, retrospective study, bullous drug reactions and atopic eczema were the commonest causes for admission in adults and children respectively. Other frequent diagnoses in adults included dermatitis NOS, seborrheic dermatitis, severe viral infections, psoriasis, deep fungal infections and blistering dermatoses. It is important that the management of these conditions is optimized. This may prevent some cases from being admitted and for those admitted improve morbidity and mortality. Timeous referral is key to the positive outcome of these patients as well as ongoing CME for healthcare professionals in South Africa.

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APPENDICES

Appendix 1: Study protocol

Appendix 2: The guidelines for authorship for the SAMJ

Appendix 3: Ethical approvals

Appendix 4: Data collection tool

Appendix 1; Research protocol

THE CLINICAL SPECTRUM AND OUTCOME OF DERMATOLOGICAL CONDITIONS IN PATIENTS ADMITTED TO DERMATOLOGY WARDS AT KING EDWARD VIII HOSPITAL, DURBAN.

Researcher

Dr MN Mazibuko

Co-Researcher

Dr NC Dlova

Institutions

University of KwaZulu-Natal

King Edward Hospital

Correspondence

Department of Dermatology

University of KwaZulu-Natal

Durban

South Africa

Dr MN Mazibuko Date: 16 April 2015

EXECUTIVE SUMMARY

Background: King Edward dermatology department receives a lot of referrals from local clinics/hospitals and peripheral hospitals. Some of these patients get admitted to the dermatology wards for management/diagnostic workup. Approximately 150 patients get admitted to dermatology wards per annum, it is important to look at the spectrum and outcome of these patients admitted to dermatology wards, at King Edward VII Hospital.

Relevance & Rationale: This study is the first of its kind in King Edward VIII Hospital and could be ground breaking for development of treatment guidelines in patients admitted to dermatology wards.

Aim and Objectives: In this study, the aim is to determine the clinical spectrum and outcome of dermatological conditions in patients admitted to dermatology wards at King Edward VIII Hospital in Durban. The objectives are to look at factors that influence the outcome of dermatological conditions in dermatology inpatients.

Study Design: This is a retrospective study.

Place and Duration of Study: Dermatology wards of King Edward VIII Hospital, Durban, KwaZulu-Natal, South Africa, from January 2012 to December 2013.

Ethical considerations: Ethical approval and permissions from relevant authorities is a pre-requisite to the study commencement. Confidentiality and privacy is maintained throughout the study and principles of good clinical practice are embraced.

Budget considerations: No funding required

Data dissemination: Data will be shared in local meetings and congress in a form of a poster.

1. BACKGROUND AND LITERATURE REVIEW

Durban is the largest city in the South African province of KwaZulu-Natal with a population of 3.44 million people (Statistics South Africa 2011). King Edward VIII Hospital which is in Durban serves most of the Kwazulu-Natal province including south and north coast. King Edward VIII has 12 beds dedicated to dermatology inpatient care and a busy outpatient department. The socio-economic status of the people in KwaZulu-Natal is very variable. Some have medical insurance or enough funds to use private medical facilities; however, the majority live in low-cost or subsidized housing or in informal housing settlement. Local clinics and district hospitals provide primary health care. Specialist care is available on a referral basis. However, the waiting lists are generally long and patients may need to travel several hundred kilometres to reach a tertiary hospital. According to our dermatology outpatient' statistics, on average 19 000 to 20 000 patients are seen in dermatology outpatient clinic per annum. Approximately 150 patients get admitted to dermatology wards per annum. This includes both children and adults. They are either admitted for disease control or for a diagnostic work up. The spectrum and outcome of these admitted patients haven't been documented.

Limited reviews of inpatient dermatology exist in the current medical literature. Dermatology is primarily an outpatient speciality in which inpatient service has traditionally played a small but nevertheless a significant part. Patients hospitalized for severe skin disorders such as psoriasis, cutaneous drug reactions, blistering diseases, skin infections, and chronic ulcers are usually managed for a prolonged time. In most instances, the treatments are complex and labor-intensive, precluding patients from applying them at home. It is now recognized that hospitalization improve patient' skin disease and their quality of life through a variety of mechanisms. This project will focus on the spectrum and outcome of skin disorders in patients admitted to the wards.

In a study that was done in Cape Town by Sue et al, most admissions to a tertiary dermatology unit were for extensive psoriasis or dermatitis. Drug reactions also appeared to be a more common indication for admission.

In a study that was done by Mosam et al in KwaZulu-Natal between 1995 and 2001, to assess and compare the HIV frequency, demography and disease spectrum in inpatients with skin disease, the majority of admissions in the HIV positive group were for, in order of frequency, seborrheic dermatitis, psoriasis, drug eruptions, and erythroderma.

2. RATIONALE AND RELEVANCE

Given the wide range of dermatoses in patients admitted to our dermatology wards at King Edward VIII Hospital, this study will make a step in the correct direction towards developing proper management guidelines.

Altogether, the success of the study will not only benefit dermatology patients admitted to our King Edward VIII Hospital wards but also benefit those dermatology patients admitted to other peripheral hospitals. It will also make the medical fraternity in general more aware of the factors that influence the outcome of dermatology inpatients.

3. AIMS AND OBJECTIVES

AIM

To describe the spectrum and outcome of dermatological conditions in patients admitted to dermatological wards in King Edward VIII Hospital, Durban.

OBJECTIVES

- To determine the disease profile of patients admitted to dermatology wards
- To determine the outcome of dermatological conditions in patients admitted to Dermatology wards
- To evaluate management and treatment factors as potential predictors of outcome

4. METHODOLOGY OF THE STUDY

4.1. Study design

This is a retrospective chart review of patients admitted to dermatology wards at king Edward VIII Hospital over a period of two years.

4.2. Study site

The study is conducted at the Dermatology wards of King Edward VIII Hospital in Durban, KwaZulu-Natal, South Africa.

4.3. Sampling

Inclusion criteria

- All patients admitted to dermatology wards
- This includes adults and children of all races

Exclusion criteria

- Ward consults from other departments will not be included in this study

Sample size

This study will include all patients who were admitted to dermatology wards between January 2012 and December 2013 as per the time schedule of this study. On average, 150 dermatology patients get admitted to the dermatology wards. This is a descriptive study so power analysis is not necessary.

Sample selection

A non-random selection technique will be used. All retrievable files of patients who were admitted between January 2012 and December 2013 will be reviewed.

5. DATA MANAGEMENT

Privacy and patient confidentiality remain central to how the data collected will be managed. At enrolment, names and file number of patients will be entered into a study register. The study register is then kept at the department of dermatology. As such, only study staff can access this information.

A data form will be used to capture patients profile, diagnosis, investigations, treatment and outcome.

5.1. Statistical analysis plan

Data analysis will be performed by a biostatistician. The data collected will be captured in Microsoft Excel and subsequently analyzed using the Intercooled Stata version 13. Descriptive statistics such as frequencies and percentages will be used to summarize results the clinical spectrum and outcome of dermatological conditions in patients admitted dermatology wards. The mean and standard deviation or the median and interquartile range will be used to summarize age. The results will be presented in tables and bar charts.

5.2. Dissemination of data and implementation of findings.

The findings will be presented in a poster at a local congress. The data will also be shared with other hospitals in the province who admit dermatology patients.

6. ETHICAL CONSIDERATIONS

This protocol is submitted to the Ethics Committee, Faculty of health Sciences, and University of KwaZulu-Natal for approval prior to commencement of the study. Furthermore, this study is conducted in accordance with Principles of Good Clinical Practice and the Declaration of Helsinki.

The study involves non-invasive procedures and as such no harm will be done to the patients. Appropriate permission to conduct a study and to extract patient information from folders is obtained from the head of department of dermatology, Dr Dlova and on behalf of King Edward Hospital, Head of Clinical Services: DR Baloyi.

There shall be no need to obtain informed consent (and accent in case of minors) from patients as this study only deals with information contained in hospital records however Privacy and confidentiality will be maintained throughout the study.

7. BUDGET

None required.

No remuneration for both patients and staff.

8. REFERENCES

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Appendix 2; Author's guidelines for SAMJ

Author Guidelines for SAMJ

Accepted manuscripts that are not in the correct format specified in these guidelines will be returned to the author(s) for correction, and will delay publication.

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Named authors must consent to publication. Authorship should be based on: (i) substantial contribution to conception, design, analysis and interpretation of data; (ii) drafting or critical revision for important intellectual content; or (iii) approval of the version to be published. These conditions must all be met (uniform requirements for manuscripts submitted to biomedical journals; refer to **www.icmje.org**).

CONFLICT OF INTEREST

Authors must declare all sources of support for the research and any association with a product or subject that may constitute conflict of interest.

RESEARCH ETHICS COMMITTEE APPROVAL

Provide evidence of Research Ethics Committee approval of the research where relevant.

PROTECTION OF PATIENT'S RIGHTS TO PRIVACY

Identifying information should not be published in written descriptions, photographs, and pedigrees unless the information is essential for scientific purposes and the patient (or parent or guardian) gives informed written consent for publication. The patient should be shown the manuscript to be published. Refer to **www.icmje.org**.

ETHNIC CLASSIFICATION

References to ethnic classification must indicate the rationale for this.

MANUSCRIPTS

Shorter items are more likely to be accepted for publication, owing to space constraints and reader preferences.

Research articles (previously 'Original articles') not exceeding 3 000 words, with up to 6 tables or illustrations, are usually observations or research of relevance to clinical medicine and related fields. *References should be limited to no more than 15.* Please provide a structured abstract not exceeding

250 words, with the following recommended headings: *Background, Objectives, Methods, Results,* and *Conclusion.*

Scientific letters will be considered for publication as shorter ***Research articles***.

Editorials, Opinions, etc. should be about 1000 words and are welcome, but unless invited, will be subjected to the *SAMJ* peer review process.

Review articles are rarely accepted unless invited.

Letters to the editor, for publication, should be about 400 words with only one illustration or table, and must include a correspondence address.

Forum articles must be accompanied by a short description (50 words) of the affiliation details/interests of the author(s). Refer to recent forum articles for guidance. Please provide an accompanying abstract not exceeding 150 words.

Book reviews should be about 400 words and must be accompanied by the publication details of the book.

Obituaries should be about 400 words and may be accompanied by a photograph.

Guidelines must be endorsed by an appropriate body prior to consideration and all conflicts of interest expressed. A structured abstract not exceeding 250 words (recommended sub-headings: *Background, Recommendations, Conclusion*) is required. Sections and sub-sections must be numbered consecutively (e.g. 1. Introduction; 1.1 Definitions; 2. etc.) and summarized in a Table of Contents. References, appendices, figures and tables must be kept to a minimum.

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Refer to articles in recent issues for the presentation of headings and subheadings. If in doubt, refer to 'uniform requirements' - **www.icmje.org**. Manuscripts must be provided in **UK English**.

Qualification, affiliation and contact details of ALL authors must be provided in the manuscript and in the online submission process.

Abbreviations should be spelt out when first used and thereafter used consistently, e.g. 'intravenous (IV)' or 'Department of Health (DoH)'.

Scientific measurements must be expressed in SI units except: blood pressure (mmHg) and haemoglobin (g/dl). Litres is denoted with a lowercase 'l' e.g. 'ml' for millilitres). Units should be

preceded by a space (except for %), e.g. '40 kg' and '20 cm' but '50%'. Greater/smaller than signs (> and 40 years of age'. The same applies to ± and º, i.e. '35±6' and '19ºC'.

Numbers should be written as grouped per thousand-units, i.e. 4 000, 22 160...

Quotes should be placed in single quotation marks: i.e. the respondent stated: '...' Round **brackets** (parentheses) should be used, as opposed to square brackets, which are reserved for denoting concentrations or insertions in direct quotes.

General formatting the manuscript must be in Microsoft Word or RTF document format. Text must be single-spaced, in 12-point Times New Roman font, and contain no unnecessary formatting (such as text in boxes, with the exception of Tables).

ILLUSTRATIONS AND TABLES

If tables or illustrations submitted have been published elsewhere, the author(s) should provide consent to republication obtained from the copyright holder.

Tables may be embedded in the manuscript file or provided as **'supplementary files'**. They must be numbered in Arabic numerals (1, 2, 3...) and referred to consecutively in the text (e.g. 'Table 1'). Tables should be constructed carefully and simply for intelligible data representation. Unnecessarily complicated tables are strongly discouraged. Tables must be cell-based (i.e. not constructed with text boxes or tabs), and accompanied by a concise title and column headings. Footnotes must be indicated with consecutive use of the following symbols: * † ‡ § ¶ || then ** †† ‡‡ etc.

Figures must be numbered in Arabic numerals and referred to in the text e.g. '(Fig. 1)'. Figure legends: Fig. 1. 'Title...' All illustrations/figures/graphs must be of **high resolution/quality**: 300 dpi or more is preferable, but images must not be resized to increase resolution. Unformatted and uncompressed images must be attached individually as '**supplementary files**' upon submission (not solely embedded in the accompanying manuscript). TIFF and PNG formats are preferable; JPEG and PDF formats are accepted, but authors must be wary of image compression. Illustrations and graphs prepared in Microsoft PowerPoint or Excel must be accompanied by the original workbook.

REFERENCES

References must be kept to a maximum of 15. Authors must verify references from original sources. *Only complete, correctly formatted reference lists will be accepted.* Reference lists must be generated manually and **not** with the use of reference manager software. Citations should be inserted in the text as superscript numbers between square brackets, e.g. These regulations are endorsed by the World Health Organization, [2] and others.[3,4-6] All references should be listed at the end of the article in numerical order of appearance in the **Vancouver style** (not alphabetical order). Approved abbreviations of journal titles must be used; see the List of Journals in Index Medicus. Names and

initials of all authors should be given; if there are more than six authors, the first three names should be given followed by et al. First and last page, volume and issue numbers should be given.

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Journal references: Price NC, Jacobs NN, Roberts DA, et al. Importance of asking about glaucoma. Stat Med 1998; 289(1):350-355. [http://dx.doi.org/10.1000/hgjr.182] [PMID: 2764753]

Book references: Jeffcoate N. Principles of Gynaecology. 4th ed. London: Butterworth, 1975:96-101.*Chapter/section in a book:* Weinstein L, Swartz MN. Pathogenic Properties of Invading Microorganisms. In: Sodeman WA Jun, Sodeman WA, eds. Pathologic Physiology: Mechanisms of Disease. Philadelphia: WB Saunders, 1974:457-472.

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8. An abstract has been included where applicable.
9. The research was approved by a Research Ethics Committee (if applicable)
10. Any conflict of interest (or competing interests) is indicated by the author(s).

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Appendix 3; BREC Approval

UNIVERSITY OF
KWAZULU-NATAL
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YAKWAZULU-NATALI

RESEARCH OFFICE
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17 June 2015

Dr MN Mazibuko (203516715)
Department of Dermatology
School of Clinical Medicine
vnzima@yahoo.com

Dear Dr Mazibuko

Protocol: The clinical and outcome of dermatological conditions in patients admitted to dermatology wards at King Edward VIII Hospital, Durban.
Degree: MMed
BREC reference number: BE221/15

PROVISIONAL APPROVAL

A sub-committee of the Biomedical Research Ethics Committee has considered your application received on 08 May 2015.

The study is given **PROVISIONAL APPROVAL** pending a response to the following:

1. Gatekeeper permissions required.

Only when full ethical approval is given, may the study begin. **Full ethics approval has not been given at this stage.**
PLEASE NOTE: Provisional approval is valid for 6 months only - should we not hear from you during this time - the study will be closed and reapplication will need to be made.
Your acceptance of this provisional approval denotes your compliance with South African National Research Ethics Guidelines (2015), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx.
BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

Yours sincerely

Anusha Marimuthu
Senior Admin Officer: Biomedical Research Ethics Committee

cc supervisor: dlovan@ukzn.ac.za

Appendix 4; Final approval from DOH

health
Department:
Health
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Reference : HRKM 201/15
NHRD: KZ_2015RP6_170
Enquiries : Mr X Xaba
Tel : 033 – 395 2805

Dear Dr MN Mazibuko

Subject: Approval of a Research Proposal

1. The research proposal titled **'The clinical spectrum and outcome of dermatological conditions in patients admitted to dermatology wards at King Edward VIII Hospital, Durban'** was reviewed by the KwaZulu-Natal Department of Health.

   The proposal is hereby **approved** for research to be undertaken at King Edward VIII Hospital.

2. You are requested to take note of the following:
   a. Make the necessary arrangement with the identified facility before commencing with your research project.
   b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.

3. Your final report must be posted to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to hrkm@kznhealth.gov.za

For any additional information please contact Mr X. Xaba on 033-395 2805.

Yours Sincerely

Dr E Lutge
Chairperson, Health Research Committee
Date: 19/08/15

Appendix 5; Data collection tool first page

Data Form: Dr MN Mazibuko

Clinical Spectrum and Disease Outcome Study: KZDERM

	Please Complete/Mark with " X"			For Office Use Only	
Study Number	**KZDERM_____/_____/_____**				1-3
1. Age (in years)					4-5
2. Gender	1.Male	2.Female			6
3. Admission Diagnosis					
1. Infectious Dx		Specify type			7-8
2. Inflammatory Dx		Specify type			9-10
3. Neoplastic Dx		Specify type			11-12
4. Drug Eruption		Specify type			13-14
4. Comorbid Conditions					
1. Diabetes					15
2. Hypertension					16
3. HIV/AIDS					17
5. Investigations done					
1. PCT					18
2. FBC,Diff					19
3. LFT/ U&E					20
4. Xray Chest					21
5. Biopsy					22
6. HIV Test					23
7. Sputa for TB					24
6. Clinical Outcome					
1. Discharged with F/U					25
2. Referred to:		Specify			26-27
3. Deceased	**1. Yes**	**2. No**			28
7. Length of stay in hospital (in Days)					29-30
8. IN-Hospital Treatment					
1. Disease specific Protocol followed	1. YES	2. NO			31
NB: see addendum for sub categories above					

Appendix 6; Data collection tool second page

Data Form Addendum

Sub Categories' List

3.1. Infectious Dx

1. Deep Fungal infection
2. Severe Bacterial infection
3. Severe Viral infection

3.2. Inflammatory disease

1. Psoriasis
2. Atopic Dermatitis
3. Seborrheic Dermatitis
4. Sebo-Psoriasis
5. Autoimmune Blistering disease
6. PRP
7. Dermatitis NOS

3.3. Neoplastic Dx

1. Mycosis Fungoides
2. Kaposi Sarcoma

3.4. Drug eruptions

1. SJS (Steven Johnson syndrome)
2. TEN (Toxic Epidermal Necrolysis)
3. TEN/SJS Overlap
4. DRESS (Drug Eruption With Eosinophilia and systemic involvement)
5. Erythroderma

6. Clinical Outcome

6.2. Referred to

1. Haematology
2. General Medicine
3. Oncology
4. Infectious disease