

Profile of Skin Diseases among Patients Attending a Dermatology Outpatient Clinic: A Record-based Cross-sectional Study from a Tertiary Care Centre in Northern Kerala, India

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ABSTRACT

Introduction: Epidemiological studies to determine the pattern of skin diseases among patients attending a hospital are important for proper healthcare planning and management. They give insight to the epidemiology of diseases. Similar studies have not been conducted in Northern Kerala recently.

Aim: To identify the pattern of diseases among patients who attended the Outpatient (OP) section of the Department of Dermatology in our hospital.

Materials and Methods: The present study was retrospective, record-based cross-sectional study in which OP registers of the Department of Dermatology from December 2018 to November 2019 were analysed retrospectively. Skin diseases were grouped into different groups and the frequency of cases in each group was studied. These were also categorised according to different age groups, gender and month of their OP visit. Descriptive statistics were used to analyse the data. Data analysis was performed using Microsoft Excel and R software (R version 3.6.1 (2019-07-05)).

Results: Out of the 17,907 new patients, 42.7% of them had infections, of which fungal infections were the most common.

Eczema (27.7%) was the common group. Significant difference in male: female ratio was seen in melasma (14:95), leprosy (13:2), drug reaction (1:28), connective tissue diseases (0:18) and Vesiculobullous (VB) (0:4). Monthly split-up of cases showed increased frequency of some groups of diseases during some months, these include Sexually Transmitted Infections (STI) in February-9/20 (45%), leprosy in May-4/15 (26.7%), drug reaction in December- 9/29 (31%), connective tissue diseases in April- 6/18 (33.3%) and VB diseases in February 4/4 (100%).

Conclusion: Infections and eczemas which could be managed in primary healthcare set-up contributed to majority of the OP attendance of our tertiary care centre. The peripheral institutions should be strengthened in manpower and the level of knowledge and skills. More focused and effective training of medical students, continuing medical education for general practitioners and the implementation of family physician system should gain more importance in our country. Increased frequency of some diseases was seen during some months these findings have to be confirmed by longer duration studies.

Keywords: Connective tissue diseases, Eczema, Fungal infection, Leprosy, Vesiculobullous

INTRODUCTION

Dermatological diseases form a large proportion of the OP department in any major hospital. Skin diseases are influenced by various factors like the environment, economic status, literacy, racial and social customs. The pattern of skin diseases varies from one country to another country and in various regions within the same country [1]. It is more so in India, where the climate, socio-economic status, religions and customs are widely varied in different parts of the country [2-4].

Apart from environmental factors, the skin disease pattern varies depending on occupation, socio-economic status, age and sex of the patients. Patterns of skin diseases from tertiary care centres in Kerala have been studied earlier [2,5,6]. In the study by Asokan N et al., the need to strengthen the primary healthcare system was highlighted and insisted on referral systems to focus on training of medical students and an effective tertiary care health delivery system [5]. Reports on the pattern of skin diseases pertaining to Northern Kerala, India are so far not available. The current retrospective study of the skin disease pattern was undertaken to fill this lacuna.

The record-based cross-sectional study was chosen because the number of patients coming to the OP clinic was high in the centre. Present study aimed to retrospectively analyse the pattern of skin

diseases in the patients attending Dermatology OP for a period of one year and to determine the association of skin diseases, if any, in relation to different seasons, age groups and gender.

MATERIALS AND METHODS

A retrospective, record-based cross-sectional study was conducted from December 2018 to November 2019. The OP registers of the department during this period were analysed. The registers were taken after getting permission from the Superintendent, Head of the Department and the Institutional Ethics Committee (IEC). The number of cases was on an average of 400 per day. So, as a representative sample, patients registered on Mondays and Saturdays were only analysed.

Inclusion criteria: The study included all new patients entered on the OP register on Mondays and Saturdays. Due to the selection of week and weekend days, this OP population included patients of all age, sex and social class like children, employed, unemployed and elderly. Diagnosis was primarily clinical, supported by relevant investigations and as per entry in the OP register. Data collected from the register was documented and analysed. For analysis, different skin diseases were broadly grouped into different groups and the frequency of cases in each group was studied. The groups were eczemas, psoriasis, lichen planus, pityriasis rosea,

other papulosquamous diseases, pigmentation disorders, vitiligo, fungal, bacterial and viral infections, parasitic infestation, STIs, leprosy, malignancies, connective tissue diseases, VB diseases and drug reactions.

Exclusion criteria: Patients diagnosed with skin cancer, subungal, ocular, and visceral lesions and metastases were excluded from the study.

STATISTICAL ANALYSIS

Data were entered under different age, sex and the pattern of skin diseases groups. A monthly split-up of these demographic and clinical characteristics for this study sample was analysed using descriptive statistics. Descriptive statistics for quantitative variables were summarised as counts and percentages. Data analysis was performed using Microsoft Excel and R software (R version 3.6.1 (2019-07-05)).

RESULTS

There were a total of 17,907 cases who attended the skin OP clinic on the stipulated days during this period. There were 2655 (14.8%) children below 10 years. The maximum number of cases belonged to the age group of 11 to 20 (4071, 22.7%) and the minimum number belonged to more than 70 age groups. (224, 1.3%) [Table/Fig-1]. Females showed mild preponderance, 9674 patients (54%) [Table/Fig-2]. The distribution of cases in each month during the study period is shown in [Table/Fig-3].

Age (years)	Frequency	Percentage (%)
1-10	2655	14.8
11-20	4071	22.7
21-30	2825	15.8
31-40	3208	17.9
41-50	2288	12.8
51-60	1520	8.5
61-70	1116	6.2
>70	224	1.3
Total	17907	100

[Table/Fig-1]: Age distribution.

Sex	Frequency	Percentage (%)
Male	8233	46
Female	9674	54
Total	17907	100

[Table/Fig-2]: Sex distribution.

Month	No. of cases	Percentage (%)
December 2018	1422	7.9
January 2019	1488	8.3
February 2019	1420	7.9
March 2019	1503	8.4
April 2019	1466	8.2
May 2019	1497	8.4
June 2019	1575	8.8
July 2019	1463	8.2
August 2019	1495	8.3
September 2019	1497	8.4
October 2019	1576	8.8
November 2019	1505	8.4
Total	17907	100

[Table/Fig-3]: Month wise distribution of cases.

Among different groups of diseases recorded, infections were the most common- 7640 patients (42.7%) out of 17907, this was

followed by eczema, accounting for 4953 (27.7%), papulosquamous disorders 956 (5.3%) and acne vulgaris 622 (3.5%) [Table/Fig-4]. Infections (excluding leprosy and sexually transmitted diseases) constituted the single largest group of diseases and were comprised of fungal (5393; 30.1%), bacterial (1510; 8.4%), parasitic (938; 5.2%) and viral (770; 4.3%) infections. Leprosy was the presenting disease in 15 patients (0.1%) and STIs in 20 (0.1%).

No.	Diagnosis	Frequency	Percentage (%)
1	Infections	7640	42.7
1a	Bacterial	1477	8.3
1b	Fungal	5393	30.1
1c	Viral	770	4.3
2	Infestations	938	5.2
3	Eczema	4953	27.7
4	Papulosquamous diseases	956	5.3
5	Acne vulgaris	622	3.5
6	Urticaria	474	2.6
7	Pigment disorders	385	2.1
8	Vitiligo	113	0.6
9	Melasma	109	0.6
10	Tumours (benign and malignant)	233	1.3
11	Keloid	49	0.3
12	Sexually Transmitted Infections (STI)	20	0.1
13	Leprosy	15	0.1
14	Drug reaction	29	0.2
15	Collagen vascular diseases	18	0.1
16	Vesiculobullous (VB) diseases	4	0.02
17	Miscellaneous	1349	7.5

[Table/Fig-4]: Distribution according to different disease groups.

Gender predilection was seen in melasma (14 males and 95 females), leprosy (13 males and two females), drug reaction (one male and 28 females), connective tissue diseases (all 18 patients were females) and VB diseases (all four patients were females) [Table/Fig-5].

Number	Disease	Male		Female		Total
		n	%	n	%	
1	Infection	3588	43.6	4052	41.8	7640
1a	Bacterial	770	9.4	707	7.3	1477
1b	Fungal	2462	29.9	2931	30.3	5393
1c	Viral	362	4.4	408	4.2	770
2	Infestations	472	5.7	466	4.8	938
3	Papulosquamous	450	5.5	506	5.2	956
4	Other pigment disease	166	2	219	2.3	385
5	Vitiligo	63	0.8	50	0.5	113
6	Melasma	14	0.2	95	1	109
7	Tumours	37	0.4	83	0.9	120
8	Benign tumour	34	0.4	79	0.8	113
9	Eczema	2325	28.3	2628	27.1	4953
10	Urticaria	226	2.7	248	2.6	474
11	Acne vulgaris	261	3.2	361	3.7	622
12	Hypertrophic lesions	24	0.3	25	0.3	49
13	Sexually Transmitted Infections (STI)	10	0.1	10	0.1	20
14	Leprosy	13	0.2	2	0	15
15	Drug reactions	1	0	28	0.3	29
16	Connective tissue diseases	0	0	18	0.2	18
17	Vesiculobullous (VB)	0	0	4	0	4
18	Miscellaneous	770	9.4	579	6.0	1349

[Table/Fig-5]: Genderwise distribution of different disease groups.

The total number of cases on a monthly basis ranged from 1420 (February) to 1576 (October). A monthly split-up of cases according to disease groups is shown in [Table/Fig-6]. Out of the disease groups, increased frequency of some groups of diseases were observed in the following months-bacterial (199/1510) and fungal infection (600/5393) in June, viral infection (88/770) in March, scabies in December and March (98/938), papulosquamous (125/956) in December, vitiligo in May (20/113), melasma in April (17/109), urticaria in June (70/474), acne in January (77/622), STIs in February-9/20 (45%), leprosy in May-4/15 (26.7%), drug reaction in December- 9/29 (31%), connective tissue diseases in April- 6/18 (33.3%), VB diseases in February 4/4 (100%). This was more evident in diseases- STIs, leprosy, drug reaction, connective tissue diseases and VB diseases [Table/Fig-6].

in addition to many other factors, widespread use of European closets also increased the rate of transmission of dermatophytic infection. This fact is reflected by the increase in the number of cases among younger age groups, the huge number of the urban population and students with dermatophytosis who are residing in hostels.

Significant differences between males and females were seen in some diseases. Male: female ratio in these diseases were as follows- melasma (14:95), acne vulgaris (261:361), leprosy (13:2), drug reaction (1:28), connective tissue diseases (0:18) and VB (0:4). Female predilection was usually seen in melasma, drug reaction, connective tissue diseases and VB diseases although the difference is exaggerated in present study [1,2]. Leprosy usually follows male predisposition [1].

Number of cases	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Au	Sep	Oct	Nov	Total
Infections	509	556	672	628	612	683	829	570	564	688	653	676	7640
Bacterial	94	100	76	126	87	188	199	102	74	161	126	144	1477
Fungal	382	396	512	414	457	425	600	407	410	452	464	474	5393
Viral	33	60	85	88	68	70	55	62	47	80	63	59	770
Infestations	98	81	55	98	72	79	47	82	84	74	87	81	938
Papulosquamous	125	80	102	93	91	44	61	63	110	48	67	72	956
Pigment disease	22	32	23	32	31	58	20	34	24	44	35	30	385
Vitiligo	10	10	4	12	6	20	1	12	10	17	7	4	113
Melasma	2	14	10	7	17	7	3	10	6	8	12	13	109
Skin tags/SK	13	7	15	4	6	16	2	8	11	15	9	14	120
Benign Tumour	13	6	15	4	4	15	2	8	11	15	7	13	113
Eczema	364	502	386	474	438	440	458	397	390	406	364	334	4953
Urticaria	39	34	36	27	33	34	70	36	44	31	49	41	474
Acne	48	77	54	42	62	41	31	51	49	46	56	65	622
Keloids	1	5	8	10	7	1	0	1	0	2	8	6	49
STI	0	0	9	0	1	0	0	1	2	2	2	3	20
Leprosy	0	0	0	0	1	4	0	2	1	2	3	2	15
Drug reaction	9	1	0	0	0	4	0	3	7	2	0	3	29
CTD	0	0	2	2	6	3	0	2	0	2	1	0	18
VB	0	0	4	0	0	0	0	0	0	0	0	0	4
Misc.	169	83	25	70	76	48	51	184	184	95	216	148	1349
Total cases	1422	1488	1420	1503	1466	1497	1575	1463	1495	1497	1576	1505	17907

[Table/Fig-6]: Monthly split-up of cases.

Dec: December; Jan: January; Feb: February; Mar: March; Apr: April; Jun: June; Jul: July; Au: August; Sep: September; Oct: October; Nov: November; SK: Seborrheic keratosis; STI: Sexually transmitted infections; CTD: Connective tissue disease; VB: Vesiculobullous diseases; Misc: Miscellaneous

DISCUSSION

Infections and eczemas contributed to the majority of the OP attendance, which was similar to many other studies [5,6]. Most of these cases could be managed by a primary healthcare doctor. This fact that common infections and eczemas account for such a large volume of OP attendance, points to the poorly developed referral system in our healthcare.

Fungal infection contributed to 30.1% while it was less in previous studies in Kerala. The prevalence was 18.74% in a study by Asokan N et al., 14.18% in a study by Nair PS et al., in 1999 and 17.19% in a study by Devi T and Zamzachin G in 2006 [5-7]. It is an indisputable fact that there has been an increase in the prevalence of dermatophytosis over the past few years across the country [8]. The recent prevalence of dermatophytosis in India ranges from 36.6-78.4% [9]. Studies in the last five years have shown greater proportions of patients from urban areas (around 80% of patients) than in rural areas. Maximum cases were seen in young adults and adolescents in most of the recent studies [9,10]. In present study also, the 11-20 years age group was the most commonly affected group. Inadvertent use of topical steroids and illiteracy about the general measures to prevent and control the infection were noted as causes of uncontrolled tinea infection. Authors propose that

Seasonal variation was demonstrated in some studies, with eczematous conditions and bacterial infection being higher during autumn and winter [11]. In present study, some diseases showed clustering in some months. VB diseases were confirmed in four patients. All these patients had their first visit in February. No seasonal trend for VB diseases has been reported in previous studies. This observation might be due to chance as it is only a one-year observation. Autoimmune diseases result from the interaction between predisposing genetic factors and exogenous factors, the most common being drugs and food [1]. So whether any food, drug or any unknown substances have provoked the development, this has to be confirmed by epidemiological studies of longer duration.

The month with the highest number of patients (nine out of 29) with drug reactions came was January. A relationship between viral infections and the simultaneous or subsequent development of drug rashes has been observed in a number of clinical situations [1]. Most proven is the relation between Drug Hypersensitivity Syndrome (DHS) and Human Herpes Virus (HHV) [12]. Although the type of drug reaction is not studied, authors consider this worth reporting because of the possible association with an infectious aetiology.

All 18 patients with connective tissue diseases were females and most patients (nine out of 18 patients) presented to OP in April and May. April and May are the summer seasons of Kerala and sunlight might have precipitated the symptoms. Similarly, melasma and vitiligo, which can be exacerbated by sunlight, were also common during these months. More cases of leprosy were presented in March, probably due to vigilant screening following observation of the leprosy in January.

Limitation(s)

The main limitation was that the study was only conducted for one year and patients coming on only two days in a week were selected. Hence, the relevance of month-wise distribution findings is difficult to assess. But authors believe that this is worth reporting because of the rarity of such studies. These findings have to be reassessed in more long-term studies.

CONCLUSION(S)

Though present study was conducted in a tertiary centre, most of the cases were common dermatological conditions like infections and eczemas which should be ideally managed in the primary healthcare set-up. To achieve this, the peripheral institutions should be strengthened with manpower and the required level of knowledge in dermatology. More focused and effective training of medical students about management of common skin conditions at the undergraduate level, atleast two weeks' compulsory posting in dermatology during an internship and continuing medical education for practitioners, are important in this regard. The role of family physician should gain more importance in our country. Clustering of diseases like VB diseases, connective tissue diseases and drug reactions during certain months was seen in present study which should be confirmed by studies involving longer duration.

REFERENCES

- [1] Rook A, Savin JA, Wilkinson DS. The prevalence, incidence and ecology of diseases of skin. In: Rook A, Wilkinson DS, Ebling FJ, Champion RH, Burton JL, editors, Text book of Dermatology. Oxford University Press: Mumbai. 1987. Pp. 39-53.
- [2] Gangadharan C, Joseph A, Sarojini PA. Pattern of skin diseases in Kerala. Indian J Dermatol Venereol Leprol. 1976;42:49-51. <https://ijdv.com/pattern-of-skin-diseases-in-kerala/>.
- [3] Mehta TK. Pattern of skin diseases in India. India J Dermatol Venereol Leprol. 1962;28:1349. <https://pubmed.ncbi.nlm.nih.gov/29244312/>.
- [4] Kuruvilla M, Sridhar KS, Kumar P, Rao G. Pattern of skin diseases in Bantwal Taluq, Dakshina Kannada. Indian J Dermatol Venereol Leprol. 2000;66:247-48. <https://pubmed.ncbi.nlm.nih.gov/20877090/>.
- [5] Asokan N, Prathap P, Ajithkumar K, Ambooken B, Binesh VG, George S. Pattern of skin diseases among patients attending a tertiary care teaching hospital in Kerala. Indian J Dermatol Venereol Leprol. 2009;75:517-18. <https://ijdv.com/pattern-of-skin-diseases-among-patients-attending-a-tertiary-care-teaching-hospital-in-kerala/>.
- [6] Nair SP, Gopalakrishnan Nair TV. Pattern of dermatological diseases in Trivandrum. Indian J Dermatol Venereol Leprol. 1999;65:261-63. <https://ijdv.com/pattern-of-dermatological-diseases-in-trivandrum/>.
- [7] Devi T, Zamzachin G. Pattern of skin diseases in Imphal. Indian J Dermatol. 2006;51:149-50. <https://www.e-ijd.org/article.asp?issn=0019-5154;year=2006;volume=51;issue=2;spage=149;epage=150;aulast=Devi>.
- [8] Verma S, Madhu R. The great Indian epidemic of superficial dermatophytosis: An appraisal. Indian J Dermatol. 2017;62(3):227-36. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5448256/>.
- [9] Rajagopalan M, Inamadar A, Mittal A, Miskeen AK, Srinivas CR, Sardana K, et al. The unprecedented epidemic-like scenario of dermatophytosis in India (ECTODERM India). BMC Dermatol. 2018;18(1):6. Doi: 10.1186/s12895-018-0073-1. PMID: 30041646; PMCID: PMC6057051.10.
- [10] Verma SB, Panda S, Nenoff P, Singal A, Rudramurthy SM, Uhrlass S, et al. Expert Consensus on The Management of Dermatophytosis in India: I. Epidemiology, risk factors and clinical features. Indian J Dermatol Venereol Leprol. 2021;87:154-75. <https://pubmed.ncbi.nlm.nih.gov/33769736/>.
- [11] Kelbore AG, Owiti P, Reid AJ, Bogino EA, Wondewosen L, Dessu BK. Pattern of skin diseases in children attending a dermatology clinic in a referral hospital in Wolaita Sodo, southern Ethiopia. BMC Dermatol. 2019;19(1):5. Doi: 10.1186/s12895-019-0085-5. PMID: 30961561; PMCID: PMC6454754.
- [12] Shiohara T, Kano Y. A complex interaction between drug allergy and viral infection. Clin Rev Allergy Immunol. 2007;33(1-2):124-33. <https://pubmed.ncbi.nlm.nih.gov/18094951/>

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