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A Retrospective Study Conducted at Public Health Institutions in Tigray, Northern Ethiopia, Examined the Prevalence of Skin Diseases and Their Classification Using Syndrome Screening

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Abstract

Background: Skin infections are the fourth-most common cause of human disease worldwide, affecting approximately 1.9 billion people every year. This study was conducted because skin diseases have a more serious impact in our setting. Understanding the impact of skin diseases is important in order to reduce the burden of skin disease and use it for health planning and management. This study was undertaken to classify of skin disease and its etiologic prevalence in our setting.

Setting: Patient attending in all health facility with available completed data on laboratory and symptomatic diagnosis from July 2019 to June 2020.

Participants: 51, 1162 patients with Skin disease classified as infectious and non-infectious.

Method: Retrospective cross-sectional study with descriptive statistics analysis to compare measures of prevalence and its classification of skin disease between age group, sex were used to display the results using table. An association between the disease conditions and was determined by using the Chi-square test. Level was set at 5%.

Main outcome measures: measures of prevalence and its classification of skin disease as infectious and non-infectious.

Result: 43.9% had infectious skin diseases, with tinea infections being the most common. The study identified 39.6% of tinea infections in 20251 cases, followed by Pityriasis versicolor in 1969 (3.8%) and Ptyriasis alba 287 (0.6%). The majority of non-infectious diseases in patients are atopic contact dermatitis and impetigo (43.4%), followed by acne (2.2%), impetigo (8.2%), psoriasis (3.3%), and vitiligo (2.3%).

Conclusion: Fungal infections and atopic contact dermatitis are the most common skin diseases in the Tigray population. Understanding these dermatomes is crucial for health policy planning and management and implementing appropriate interventions.

Keywords: Skin diseases; Prevalence; Classification; Syndrome screening

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Background

Millions of individuals are being affected by the rising prevalence of skin infections globally. Now more than ever before, it is understood how seriously skin infections affect people's quality of life [1]. One of the main causes of the global burden of disease is skin disease. They cause severe morbidity and impact people of all ages and cultures [2]. The frequency of atopic dermatitis (AD), a prevalent inflammatory skin disease marked by severe itching, is rising in developing countries, particularly in Africa [3].

Pruritus, psoriasis, and other skin diseases are widespread health issues that account for a sizable portion of the world's burden of illness [4]. Both developed and underdeveloped nations are heavily burdened by skin problems. People of all ages can develop skin problems, but children are especially vulnerable [5]. Infections of the skin, hair, and nails caused by fungi are thought

to affect about a billion people globally. In 2017, fungi caused 10.09% of all skin disorders worldwide, and they contributed significantly (0.17%) to the 1.76 percent of DALYs (disability adjusted life years) caused by skin diseases [6].

It is estimated that 20 to 25 percent of the world's population is affected by superficial mycoses globally [7]. Dermatologists have been in the forefront of efforts to measure and assess the global burden of skin disease, which is disproportionately experienced by women [8]. Even though infections typically predominate the pattern of skin sickness in tropical countries and also there has been an annual increase in the prevalence and morbidity of skin and subcutaneous disorders worldwide. In order to properly characterize skin diseases and develop interventions that have a greater impact and are more durable, large-scale epidemiologic data is helpful. [9,10]. It is crucial to remember that a variety of skin illnesses can have a significant influence on health. In 2010, skin diseases were classified as the fourth most common source of nonfatal disease burden worldwide, in both high-income and low-income nations. Ethiopia has the second biggest population in Africa. However, the effects of skin diseases may result in society as a whole having less access to healthcare [11-14]. Due to the lack of resources, conducting population-based research can be difficult in low-and middle-income nations. For the correct management and planning of healthcare, epidemiological studies to ascertain the pattern and prevalence of skin diseases in all age groups are essential.

Methods

Study design and setting

This was a one-year retrospective data analysis using data from the HMIS reporting system (July 2019-August 2020). HMIS is a monthly reporting system that includes data from all of the region's health facilities. Data from all health facilities were stored in the Tigray regional health bureau (TRHB). According to a study evaluating the quality of HMIS data conducted in 2019-2020, the majority of data were shown to be of high quality, with high proportions of health facilities achieving acceptable verification factors for data on different indicators in all districts of Tigray, which included all age groups of 51,162 patients with skin disease who attended the Dermatology Outpatient Department (OPD). Demographic information such as age, gender, and clinical diagnosis were collected.

Data Source and collection procedures

The overall number of patients diagnosed is reported electronically in the HMIS. Data from the HMIS database collection form was confidentially recorded in Microsoft Excel. The information gathered comprised the number of patients diagnosed by kind of healthcare facility, location (district), and year. The data come from regional skin diagnostic for the years 2019-2020. The study outcome variables of interest were the number of people diagnosed with infectious and non-infectious skin illness, as well as the number of people diagnosed with such. Tigray is divided into seven zones, each with 94 districts; one province (Mekelle city) is made up entirely of ten urban districts, while the other provinces have at least one or two semi-urban districts and numerous rural districts. The healthcare system is separated into public and private healthcare facilities. The region's overall health coverage has reached 90%, with 2 comprehensive specialized referral hospitals, 16 general hospitals, 22 basic hospitals, and 224 state health centers.

Eligibility criteria

In our research, we included all patients over the age of one who visited dermatology clinics throughout the region and whose diagnostic results were completely captured in the HMIS data set. Our investigation excluded patient recordings having a degraded record history.

Data analysis

Data was gathered, inputted, and analyzed in Microsoft Excel 2010 before being cleared and checked for completeness. Frequencies and percentages were expressed using a descriptive analysis of the patient's socio-demographic and illness variables. Tables were used to present the results.

Data quality assurance

The completeness and consistency of the data were evaluated in Microsoft Excel.

Results

The characteristics and prevalence of skin disease

Infectious skin disorders accounted for 43.6% (22,340/51162) of the total, Tinea infections accounted for 39.2% (20,084/51162), and non-infectious diseases accounted for 56.3% (28,822/51162). The five most prevalent skin illnesses (in decreasing order of incidence) were atopic contact dermatitis (35.2%), Tineacorporis (13.7%), Tineabarbae (11.8%), Pityriasis versicolor (3.8%), and Psoriasis (3.3%). Tinea infections were the most common among the infected cases, accounting for 20,251 (21.9%), followed by Pityriasis versicolor in 1,969 cases (3.8%) and Pityriasisalba in 287 instances (0.6%). Atopic contact dermatitis was the most frequent non-infectious disease, accounting for 18,017 cases (35.2%), followed by Impetigo (4,199 cases (8.2%) and Acne vulgaris (4,199 cases (8.2%). Psoriasis was identified in 1704 instances (3.3%), among the pigment disorders Vitiligo in 1,178 cases (2.3%), Eczema in 1,014 cases (1.9%), Seborrheic dermatitis in 949 (1.8%), and Allergic Purpura in 460 cases (0.9%) are reported in **Table 1**.

Prevalence of infectious skin diseases stratified by age and sex

The total prevalence of infectious dermatomes was greater in men than in women [(10,123/51162 (19.8%) vs 9,584/51162 (18.7%)]. The 15-64 age groups accounted for 53.3% (9202/17251) of Tinea infections. T. cruris, T. corporis, T. pedis, and P. alba were more common in men, whereas T. unguium and T. barbaewere more common in women. This was especially noticeable in cases where Tineamanuum afflicted both sexes equally. T. cruris, T. corporis, T. manuum, P. alba, and T. barbaeare more common in men aged 1 to 14 years, but T. unguiumwas 79/167 (47.3%) (15-29

Table 1. Characteristics and Prevalence of Skin Disease in Tigray from Jul 2019 to Aug 2020.

Type of skin disease	Frequency (n)	Percentage (%)
Tineabarbae	10913	11.8
Impetigo	4199	8.2
Acne vulgaris	1134	2.2
Tinea Manuum	94	0.2
Tineapedis	1655	1.8
Vitiligo	1178	2.3
Pityriasis alba	287	0.6
Tinea Unguium	167	0.32
Psoriasis	1704	3.3
Tineacruris	414	0.8
Tineacorporis	7008	13.7
Eczema	1014	1.9
Allergic purpura	460	0.9
Seborrhoeic dermatitis	949	1.8
Pityriasis Versicolor	1969	3.8
Allergic contact dermatitis	18017	35.2
Total	51162	

Table 2. Prevalence of Infectious Skin Diseases Stratified By Age and Sex.

Type of Skin Disease	Jan-14		15-29		30-64		>65	
	Male	Female	Male	Female	Male	Female	Male	Female
Tineaunguium	11	16	23	56	35	19	4	3
Tineacruris	104	74	88	57	46	30	13	2
Tineacorporis	1565	1463	1367	1109	782	544	111	67
Tineabarbae	1012	3354	1207	948	765	486	96	45
Tineamanuum	17	11	17	17	11	17	2	2
Tineapedis	178	244	396	289	305	191	44	8
Pityriasis alba	95	89	38	40	19	2	4	0
Pityriasisversicolar	256	186	756	441	200	307	17	6

years) common in adults and the incidence increases with age. Of the 1655 patients withT. pedis, 55.7% (923/1655) were men and 44.2% (732/1655) were girls. The prevalence of T. cruris, T. corporis, and P. alba declines with age group in each gender. There were 1229 (62.4%) males and 740 (37.6%) females out of the 1969 P. versicolor population, with males slightly outnumbering females. Most cases (1197, 60.7%) affected people aged 15 to 29. The majority of cases were young adults. In general, 424 (0.8%) persons over 65 years old had infectious skin illnesses (**Table 2**).

Prevalence of non-infectious skin diseases stratified by age and sex

Psoriasis affected 3.3% of people, including 709 (58.9%) males and 495 (41.1%) women. Psoriasis affects approximately 36.4% of people aged 15 to 29. Vitiligo affected 597/1178 (50.7%) males and 581/1178 (49.3%) females, with a frequency of 45.6% (537/1178) in the age group 15-29 years. Men are more likely than women to suffer from vitiligo and psoriasis. Psoriasis prevalence increased by 0.52% and 0.45% in the 15-29 and 30-64 age groups,

Respectively. Acne vulgaris was found to be 2.2% prevalent. Acne vulgaris was reported more frequently in men (563/1134 (49.6%)) than in women (548/1134 (48.3%)). Acne was more frequent among people aged 15 to 29. The one-year prevalence of atopic contact dermatitis was 35.2%, with males having a greater rate than females (8165/18017 (45.3%) versus males 9842/18017 (54.6%)). The yearly prevalence of hand eczema was 1.9%. Males had a higher prevalence (57.6%) than females (42.4%). Non-infectious skin problems were uncommon in people over the age of 65 (2.3%). The distribution of non-infectious skin illnesses by age stratified group found 12.2% atopic contact dermatitis in the 1-14 year age group, 21% in adults (15-65 years), and 1.9% in older adults over 65. **Table 3** shows that adults had the highest prevalence compared to children aged 1 to 14 years.

Discussion

Skin illnesses are a huge burden in Africa, and they are becoming a global problem. Despite this, there have been little research done on skin illnesses in our community, and the results of past studies may not provide an accurate picture of the overall disease pattern and prevalence of skin diseases. The current study tried to classify of skin disease and its etiologic prevalence in patients attending all health facilities in Tigray Region, Ethiopia.

In was found in this study that 22,507 participants (43.9%) had skin infection disorders that were contagious. Of them, 20,251 (39.6%) had Tinea infections, and the next two diseases were Versicolor 1969 (3.8%) and P. alba 287 (0.6%). 18017 (35.2%)

Table 3. Age and sex non-infectious skin diseases.

Type of skin Disease	Jan-14		15-29		30-64		>65	
	Male	Female	Male	Female	Male	Female	Male	Female
Psoriasis	182	154	268	170	229	156	30	15
Eczema	183	145	175	139	190	133	36	13
Allergic contact dermatitis	3541	2724	2968	2624	2725	2453	608	364
Seborrheic Dermatitis	93	101	185	229	160	154	13	14
Allergic purpura	76	53	77	70	92	69	14	9
Impetigo	294	269	56	51	51	27	3	3
Acne vulgaris	55	23	385	402	114	116	9	7
Vitiligo	51	110	255	282	247	176	44	13
Pityriasis alba	95	89	38	40	19	2	4	0

of the patients in our study had non-infectious atopic contact dermatitis, which was followed by acne vulgaris, impetigo (8.2%), psoriasis (3.8%), vitiligo (2.3%), and 2423 (4.73%) had other non-infectious skin illnesses.

In this study, there were 22,507 individuals (43.9%) in this study had some form of fungal infection, which is greater than the average for south-west Nigeria. Of them, fungal infections on the surface accounted for 35.0% [15]. 31.3% of individuals with fungal infections in Nigeria as a whole experienced a fungal disease [16]. It was, nevertheless, lower than that of Japan (49.4%) [17]. this percentage was even less than the 23.9% [18], 6.8% of adult and 27.2% of children suffer from eczema [19].

Tinea infections could affect people of any age, however according to the current data; dermatophytosis was more common in adults between the ages of 15 and 64, accounting for 53.3% (9202/17251) of cases. The study carried out in Ethiopia, which included T. corporis (13.7%), T. barbae (11.8%), T. pedis (1.8%), T. cruris (0.8%), and T. manuum (0.2%), were higher than ours. [20], in India T. corporis (53.5%) and T. cruris (25%) [21], in Iran T. unguium (42.1%), followed by T. pedis (18.3%) [22], Tineamanuum occurs in Germany (16.2%) [23]. Tineacorporis was the most frequently observed lesion (50%) [24]. 2in Botswana T. unguium 27.50%), T. corporis [20%], T. pedis (12.50%), T. manuum [3.33%]) and also T. cruris

[3.33%] [25]. In China, T. unguium (83.92%), T. pedis (71.19%), T. cruris (91.66%), Tineacorporis (91.81%) and T. manuum (65.00%) [26]. However, Tineaunguium occurred in 48.5% of the cases, Followed by tineapedis (33.1%). T. rubrum was the predominant species in all regions of the body except the scalp [27]. In Eritrea, T. unguium accounted for 0.3% [28]. In Lithuania T. corporis (9.2%) and T. pedis (1.2%) [29].

Our findings on the prevalence of Tinea infections by age and sex indicate that children aged 1 to 14 are more likely to contract T. cruris, T. corporis, T. manuum, P. alba, and T. barbae. T. unguium, T. pedis, and T. corporis were mostly prevalent in females, whilst T. manuum and T. cruris were more prevalent in males. The distribution of dermatophytoses across the four age groups demonstrated a significant frequency of T. corporis (88%) in childhood (ages 0-9). T. unguium was seen in 63% of adult patients aged 20 to 59 years [30]. There are age-specific trends in the occurrence of cutaneous fungal infections, with a high prevalence rate in older persons, particularly those aged 50-79 years, but a low prevalence rate in children and young adults [31].

Another age and sex-specific result shows that the 25-44 age groups is the most affected, followed by the 1-14 age groups. Shambel Araya et al. [32] discovered a similar result. Tine infection was shown to be more common in male and adult patients in our investigation, which is consistent with the findings of Sophie Nutten et al. T. pedis is more common in men aged 31 to 60 [33]. T. cruris is also more prevalent in men. T. unguium and T. corporis are more common in adolescents and in children, respectively. T. pedis is common in adult men [34].

In the current study, atopic contact dermatitis accounted for 35.2% of non-infectious skin diseases, which were more common than other skin diseases; However, lower than the studies conducted in South Africa (60.1%) [35], atopic dermatitis most common in Asia [36], Congo (46.67%) [37]. Atopic contact dermatitis accounted for 35.2% of non-infectious skin diseases in the current study, which were more common than other skin diseases; however, this was higher than previous studies conducted in India 4.38%[38], China (13.4%), Israel (3.4%), Thailand (33.7%) [39], rural Bangladesh (4.0%) Italy (10.2%) and Europe (5.5%) Atopic dermatitis was frequent in all age groups. Adults were more affected in our research area. This is congruent with the findings of a study conducted in Ghana.

In this study, the prevalence of acne vulgaris was found to be 2.2%. The studies from Kenya (11.2%) Egypt (36.9%) African American32% and Hispanic women 37%Singapore 88% America (73.3%)European countries 57.8%and in Spain some form of acne 55% all had higher results than ours did. According to our findings, adults were more affected. This conclusion was supported by research from India Turkish more male affected with acne vulgaris than female in this result was in agreement with finding from USA and New Zealand.

The prevalence of P. versicolor, the second most common kind of superficial fungal infection, was 3.8% in our study. Our results are significantly inferior to those from Vietnam (22.48%) and Turkey (45.4%) Bangladesh (12.81%) Singapore (25.2%), Iraq (21.7%), Egypt (17.9%). A similar conclusion has also been connected to P. versicolor, which most usually affects young individuals and more common in men than in women. The elderly, kids, and teenagers could all be affected.

According to our analysis, 3.3% of the population had psoriasis. Our results were higher than studies from Kenya 2.6% in Brazil

2.5%,in Peru 2.5%, USA, in West African countries (Nigeria, Mali, Senegal, and Sierra Leone), which found a psoriasis prevalence of less than 1.0% and United States (0.91%),%). Malaysia (0.29%), Croatia (1.55%), UK (1.6%) China (0.7%) Mongolia 1% but lower than the finding from Saudi Arabia (5.3%) our result was consistent with the study conducted in Central Europe (0.62-5.32%) our results is show higher psoriasis in adults than children this agree with these study.

In this study, in German psoriasis were more prevalence in children the state of Minnesota in USA Men were more likely than women to have psoriasis in this study and this is consistent with study conducted in Sweden.

In our study, the vitiligo incidence was 2.3%. Our result was in the study conducted in Nigeria (0.96-4.96%). Our results outperform research from China (0.2-1.8%) the United States (1.52-2.16) Kenya (0.77%) and the reported prevalence of vitiligo in China was 0.1%-0.56% Korea (0.12%-0.13%) and Denmark (0.38%) in Benin 0.9%. in Senegal 0.1-2% in India (9.98%) Nigeria (5.3%) and South Africa (10.5-78%) and in India 2.64% Our result is higher in adolescence, slightly lower in adults, and highly declining in lower-aged people, which agrees with a study conducted in Brazil. Our results show that women are more likely than men to get vitiligo, which is consistent with findings in Iran. USA.

In our study, the vitiligo incidence was 2.3%. Our result was in the study conducted in Nigeria (0.96-4.96%)(80). Our results outperform research from China (0.2-1.8%), the United States (1.52-2.16) (82), Kenya (0.77%), in china reported prevalence of vitiligo was 0.1% to 0.56% Korea (0.12%-0.13%)(84), and Denmark (0.38%)(85). in Benin 0.9, in Congo 2%, India (9.98%), Nigeria (5.3%)(89), and South Africa 10.5 to 78% in India 2.64%. Our result has higher in adolescence, slightly lower in adult and highly decline in lower elderly people this agree with study conducted in Brazil. Our result shows that women are more likely than women to get vitiligo, which is consistent with findings, in Iran and in USA.

Conclusion

Atopic contact dermatitis and fungal infections are common in the Tigrayan population, with men being more affected than women. Planning for public health, evidence-based therapy, and community intervention all depend on an understanding of these dermatomes. The frequency of fungus and atopic contact dermatitis should be decreased by regional health bureaus.

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Author Contributions

MG and GT were involved in the study conception and design the protocol and performed the data analysis and are a major contributor to the drafting of the manuscript. MG, AG, HK, GG and MZ detailed write up and critically revise the manuscript. The authors agree to be accountable for all aspects of the work related to its integrity. All authors have read and approved the submitted manuscript.

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