Original Article

Ectoparasitic infestations among patients attending the dermatology OPD: A hospital-based study

Harihar Adhikari[1], Uttara Gautam[2], Prabhat Singh Rajput[3], Subi Basnyat[4], Pawan Marasini[5], Sandip Kumar Sharma[4], Sobi Lal Maharjan[6]

[1]Department of Dermatology, Karnali Academy of Health Sciences, Jumla Nepal
[2]Department of Paediatrics, Karnali Academy of Health Sciences, Jumla Nepal
[3]Department of Dermatology, Dhaulagiri hospital, Baglung, Gandaki province
[4]Department of Gynaecology and Obstetrics, Karnali Academy of Health Sciences, Jumla Nepal
[5]Department of Orthopaedics, Karnali Academy of Health Sciences, Jumla Nepal
[6]Sangla Primary Health Center, Tarakeswor-01, Kathmandu

Corresponding Author: Dr. Harihar Adhikari;
Email: harihar549@gmail.com; ORCID: https://orcid.org/0000-0002-8622-8748

Section editor: Lok Raj Joshi, MD

ABSTRACT

Background:
Ectoparasites are organisms that live in the skin for varying lengths of time and can cause disease. These infestations are highly prevalent in poor and underdeveloped areas. There is a paucity of studies regarding their prevalence in rural areas like the upper Karnali region of Nepal. We conducted a hospital-based study to know the burden of these infestations in the area.

Methods:
A hospital-based descriptive study was done from March 2023 to February 2024. Data were collected from medical records of the dermatology outpatient department (OPD) and all the clinically diagnosed cases of ectoparasitic infestation were studied. Data were presented as frequency and percentage; seasonal pattern of the diseases was also reported.

Results:
A total of 6,698 patients attended dermatology OPD during the study period, among whom 1340 had ectoparasitic infestations, resulting in a proportion of 20.01% in this group. Two infestations were found, namely, scabies and pediculosis capitis, with a proportion of 18.36% and 1.65%, respectively. Females represented almost half of the patients with ectoparasitic infestations (49.63%), but about 98% with pediculosis. Ectoparasitic infestation was most common in children aged 0–9 years, i.e., 31.31% and pediculosis was most common in children of 10–19 years (31.81%). Ectoparasitic infestations (41.94%), both scabies (41.7%) and pediculosis (44.55%) were most common during the monsoon season.

Conclusion:
The ectoparasitic infestations were common the patients presenting to the hospital. Scabies was the most common ectoparasitic infestation and a major public health problem.

Keywords: Ectoparasites, Ivermectin, Monsoon, Pediculosis, Scabies

Article Information

Received: 28 July 2024 Accepted: 30 August 2024 Published online: 31 August 2024

INTRODUCTION

Ectoparasites are organisms that live in the skin for varying lengths of time and can cause disease [1]. Ectoparasites cause diseases like scabies, pediculosis, tungiasis, myiasis, cutaneous larva migrans etc [2]. They may act as vectors for plague, borelliosis, tularemia, tick-borne diseases, and so forth [3,4]. Ectoparasitic infestations are highly prevalent in resource-poor populations [2]. In rural areas, diseases like scabies and pediculosis are very common [5,6].

Scabies and pediculosis capitis occur globally. About 300 million people are infested with scabies worldwide, with an increasing risk to unaffected people at any time. Similarly, in resource-limited areas, almost all individuals are permanently at risk for head lice infestation [7]. In Nepal, the prevalence of scabies is between 3.4 and 7.5% [8-11]. Similarly, the prevalence of pediculosis capitis is between 16 and 38% in Nepal [12,13].

There is a paucity of studies regarding the burden of ectoparasitic infestations in rural areas of Nepal, including the upper Karnali region. This study aims to determine the proportion of cutaneous ectoparasitic infestations among patients attending the dermatology Outpatient Department (OPD) of Karnali Academy of Health Sciences, Teaching Hospital, a tertiary care hospital in the upper Karnali region.

METHODS

A hospital-based descriptive study was done after ethical approval from the Institutional Review Committee of Karnali Academy of Health Sciences (KAHS), reference number 080/081/30. Secondary data were obtained from the OPD register of all the patients who attended dermatology OPD from March 2023 to February 2024. Data of all the clinically diagnosed cases of ectoparasitic infestations were extracted and analyzed in terms of number, and proportion. Further, we presented the percentage of ectoparasitic infestations by age and sex, as well as seasonal variations. The patients with incomplete medical records and non-cutaneous infestations were excluded. Microsoft Excel 2019 spreadsheet was used to collect and analyze the data.

RESULTS

The total number of patients that attended dermatology OPD was 6,698, of which ectoparasitic infestations were 1,340, i.e., 20.01%. Out of 1,340 patients, 1,230 had scabies (18.36%), and the remaining 110 (1.65%) had pediculosis capitis. None of the patients had both scabies and pediculosis. Nearly 51% of the patients with ectoparasitic infestation were males and 97% of pediculosis patients were female. **(Table 1)**. Ectoparasitic infestation was most common in children aged 0–9 years (31.3%), while pediculosis was most common in 10–19-year-old patients (31.8%) (**Table 2**). Ectoparasitic infestations, both scabies and pediculosis were most common during the monsoon season (**Table 3**).

Table 1: Sex-wise distribution of ectoparasitic infestations and their types

	Scabies (N, %)	Pediculosis (N, %)	Total (N, %)
Male	672 (54.63)	3 (2.72)	675 (50.37)
Female	558 (45.37)	107 (97.28)	665 (49.63)
Total	1,230 (100)	110 (100)	1,340 (100)

Table 2: Age-wise distribution of ectoparasitic infestations and their types

Age group (Years)	Scabies (N, %)	Pediculosis (N, %)	Total (N, %)
0-9	402 (32.68)	18 (16.37)	420 (31.31)
10-19	294 (23.90)	35 (31.81)	329 (24.55)
20-29	194 (15.77)	24 (21.82)	218 (16.27)
30-39	136 (11.06)	17 (15.45)	153 (11.42)
40-49	91 (7.40)	11 (10.00)	102 (7.63)
50-59	51 (4.15)	2 (1.82)	53 (3.96)
60-69	36 (2.93)	3 (2.73)	39 (2.92)
70+	26 (2.11)	0 (0)	26 (1.94)
Total	1230 (100)	110 (100)	1340 (100)

Table 3: Seasonal distribution of ectoparasitic infestations and their types from March 2023 to February 2024

Seasons of Nepal	Scabies (N, %)	Pediculosis (N, %)	Total (N, %)
Spring (Mid-March to Mid-May)	158 (12.86)	6 (5.45)	164 (12.24)
Summer (Mid-May to Mid-July)	240 (19.51)	19 (17.27)	259 (19.32)
Monsoon (Mid-July to Mid-September)	513 (41.70)	49 (44.55)	562 (41.94)
Autumn (Mid-September to Mid-November)	129 (10.48)	4 (3.64)	133 (9.93)
Pre-winter (Mid-November to Mid-January)	107 (8.70)	22 (20.00)	129 (9.63)
Winter (Mid-January to Mid-March)	83 (6.75)	10 (9.09)	93 (6.94)

Total	1230 (100)	110 (100)	1340 (100)

DISCUSSION

Ectoparasites include arthropods but mostly refer to smaller arthropods like ticks, mites and fleas [14]. These organisms not only cause diseases but also act as vectors. They are responsible for causing neglected diseases [2]. In our study, we encountered two ectoparasitic infestations – scabies caused by *Sarcoptes scabiei* and pediculosis capitis caused by *Pediculus humanus var. capitis*. These diseases fall under epidermal parasitic skin diseases because the interaction between the parasite and human is limited to the stratum corneum [7].

The prevalence of ectoparasitic infestations varies according to the different areas, with prevalence being higher in resource-poor areas. In our study, we found that the proportion of scabies was 18.36%, which was higher than other places in Nepal. A study done by Paudel et al. in a tertiary center of Nepal showed that the prevalence of scabies was 5.15% [8]. A study done by Jahan et al. in a pediatric hospital in Nepal showed that the prevalence of scabies was 7.53% [11]. Similarly, the prevalence of scabies in a rural area of India was found to be 13% [7].

The increased prevalence of scabies in our study could be because the upper Karnali region is among the underdeveloped and financially backward regions of Nepal. It could be due to overcrowding, lack of proper hygiene, lack of proper health care, malnutrition and social stigma. Scabies is highly prevalent in poor communities and its severity is also directly related to poverty [7]. The longer the duration of infestation, the more the patient becomes a reservoir of scabies, thus increasing transmission.

In our study, we found that 32.68% of total scabies patients were less than 10 years of age. A study done in Bangladesh showed that all children under 6 years of age living in deprived areas developed scabies within a year [15]. This could be due to direct contact with infested family members more frequently [16]. The history of itching among nearby contacts increases the risk of transmission [17]. Other causes for increased prevalence in children could be due to sharing clothes, towels, beds, and toilet. Unlike adults, children's immune systems are not fully developed at birth and continue to mature as they grow, making them more susceptible to new infestations. In our study, the proportion of scabies decreased with age, which is a hallmark of underdeveloped country. There is increase in scabies with old age in developed countries [18].

In our study, scabies was more common among males, especially in children. Similar finding of increased prevalence among male was also observed in the study done by Paudel et al. [8]. This could be due to the behavior of staying outdoors in close contact with other people with scabies and handling contaminated things [17]. However, women mostly stay within the confinement of houses. Other factors responsible for increased prevalence in men are their involvement in laborious work, frequent travel, ignorance of the symptoms, hence serving as a reservoir, and a lack of proper health education regarding scabies.

There are six seasons in Nepal [19]. In our study, we found that both scabies and pediculosis capitis were more common during monsoon season. This could be due to increased humidity. Other factors may include living inside houses for a longer time due to rain, which increases overcrowding. Monsoon is also a time of plantation, so a large number of people gather around in the fields. Also, there is more contact with animal at this time. Excessive sweating coupled with poor hygiene due to disturbed sanitation further adds to the burden. A study done by Liu et al. demonstrated that during summer, scabies had a positive correlation with rainy days and a negative correlation with the total sunshine period [20]. The study done by Paudel et al. demonstrated that scabies was more common during summer, taking only four seasons in a year – spring, summer, autumn and winter [8].

In our study, the proportion of pediculosis (1.65%) was lower than other studies done in Nepal. A study done in Kathmandu and Pokhara by Poudel et al. demonstrated that the prevalence of head lice ranged from 16-38% in different groups of sample [12]. A study done by Shakya et al. in governmental primary school of Nepal showed that among the skin diseases encountered, the most common was pediculosis which occurred in 21% of patients [13]. In resource-poor areas, almost all the people are at risk of pediculosis capitis [7]. Despite the upper Karnali region being one of the most underdeveloped regions of Nepal, the low prevalence of pediculosis may be due to the habit of frequently wearing head coverings, which reduces the transmission of head lice.

Pediculosis is more common in children [2]; and in our study, 48.18% of the cases occurred in patients less than 20 years of age. Pediculosis was more common in women. A similar finding was also reported by Shakya et al. [13]. This could be due to longer hairs in women and also sharing the combs and clothing with infested patients [21].

Owing to the high prevalence of ectoparasitic infestations, mass treatment in the community may be needed. Our study was limited to only scabies and pediculosis, and the control of both of them can be done with oral Ivermectin. Multiple mass treatment with Ivermectin may be needed [7]. The people of the communities have to be made aware of these conditions and their association with overcrowding. They should be encouraged to visit healthcare workers whenever problem arises.

The limitations of this study are: it may not represent the general population as only those people living near the hospital and those who have severe disease may have visited the hospital. One year period may not be adequate to determine the seasonal variations. So, in the future prospective studies encompassing multiple health centers of the region and community-based studies assessing the risk factors and other parameters related to ectoparasitic infestations are needed.

CONCLUSION

Ectoparasitic infestations are frequently encountered conditions in upper Karnali region. These are the diseases of overcrowding and poverty. The ectoparasitic infestations that we encountered were scabies and pediculosis capitis. Scabies was endemic in this region and a major public health problem so measures should be taken to minimize its burden.

Author contributions: HHA and UG conceptualized the research. All authors contributed to data collection and interpretation. HHA and UG drafted the manuscript and all authors reviewed it and approved the final version of the manuscript. All authors agreed to be accountable for all aspects of the research work.

Ethical Approval: This research was approved by IRC of Karnali Academy of Health Sciences, Jumla, Nepal with the reference number 080/ 081/ 30 on 27th March, 2024

Consent/Assent: Not applicable

Name of Registry and Registration number: Not applicable

Data Availability Statement: The data that support the findings of this study are available within the article itself.

Conflicts of Interest: The authors declare that there is no competing interest.

Source of Funding: The author(s) received no external fund for this research.

REFERENCES

1. Gizaw Z, Engdaw GT, Nigusie A, Gebrehiwot M, Destaw B. Human Ectoparasites Are Highly Prevalent in the Rural Communities of Northwest Ethiopia: A Community-Based Cross-Sectional Study. Environ Health Insights. 2021;15:11786302211034463. https://doi.org/10.1177/11786302211034463
2. Heukelbach J, Walton SF, Feldmeier H. Ectoparasitic infestations. Curr Infect Dis Rep. 2005;7(5):373-80. https://doi.org/10.1007/s11908-005-0012-2
3. Gubler DJ. Resurgent vector-borne diseases as a global health problem. Emerg Infect Dis. 1998;4(3):442-450. https://doi.org/10.3201/eid0403.980326
4. Uilenberg G. International collaborative research: significance of tick-borne hemoparasitic diseases to world animal health. Vet Parasitol. 1995;57(1-3):19-41. https://doi.org/10.1016/0304-4017(94)03107-8
5. Buczek A, Markowska-Gosik D, Widomska D, Kawa IM. Pediculosis capitis among schoolchildren in urban and rural areas of eastern Poland. Eur J Epidemiol. 2004;19(5):491-495. https://doi.org/10.1023/b:ejep.0000027347.76908.61
6. Nair PA, Vora RV, Jivani NB, Gandhi SS. A Study of Clinical Profile and Quality of Life in Patients with Scabies at a Rural Tertiary Care Centre. J Clin Diagn Res. 2016;10(10):WC01-WC05. https://doi.org/10.7860/JCDR/2016/20938.8703
7. Feldmeier H, Heukelbach J. Epidermal parasitic skin diseases: a neglected category of poverty-associated plagues. Bull World Health Organ. 2009;87(2):152-159. https://doi.org/10.2471/blt.07.047308
8. Paudel S, Sharma R, Dahal S, Acharya Paudel I. Epidemiological Profile of Skin Diseases in a Tertiary Hospital of Kathmandu: An Annual Census. Nep J Dermatol Venereol Leprol. 2021;19(1):14-9. https://doi.org/10.3126/njdvl.v19i1.34349

9. Shrestha R, Shrestha DP, Lama L, Gurung D, Rosdahl I. Pattern Of Skin Diseases In A Rural Village Development Community Of Nepal. Nep J Dermatol Venereol Leprol. 2016;12(1):41-4. https://doi.org/10.3126/njdvl.v12i1.10595
10. Walker SL, Shah M, Hubbard VG, Pradhan HM, Ghimire M. Skin disease is common in rural Nepal: results of a point prevalence study. Br J Dermatol. 2008;158(2):334-8. https://doi.org/10.1111/j.1365-2133.2007.08107.x
11. Jahan R, Khanal S, Shrestha S, Parajuli N. Skin Diseases in a Pediatric Hospital of Nepal. Dermatol Res Pract. 2021;2021:6619936. https://doi.org/10.1155/2021/6619936
12. Poudel SK, Barker SC. Infestation of people with lice in Kathmandu and Pokhara, Nepal. Med Vet Entomol. 2004;18(2):212-3. https://doi.org/10.1111/j.0269-283X.2004.00494.x
13. Shakya SR, Bhandary S, Pokharel PK. Nutritional status and morbidity pattern among governmental primary school children in the Eastern Nepal. Kathmandu Univ Med J. 2004;2(4):307-14. PMID: 16388242
14. Man E, Price HP, Hoskins C. Current and future strategies against cutaneous parasites. Pharm Res. 2022;39(4):631-51. https://doi.org/10.1007/s11095-022-03232-y
15. Stanton B, Khanam S, Nazrul H, Nurani S, Khair T. Scabies in urban Bangladesh. J Trop Med Hyg. 1987;90(5):219-26. PMID: 3669122
16. Chiriac A, Diaconeasa A, Miulescu R, Chiriac AE, Wollina U. Scabies in infants and children - a narrative review. Eur J Pediatr. 2024;183(6):2527-36. https://doi.org/10.1007/s00431-024-05535-1
17. Hasan MJ, Rafi MA, Choudhury T, Hossain MG. Prevalence and risk factors of scabies among children living in Madrasahs (Islamic religious boarding schools) of Bangladesh: a cross-sectional study. BMJ Paediatr Open. 2024;8(1). https://doi.org/10.1136/bmjpo-2023-002421
18. Rainer LA, Molefi TL, Kololo SO, Leeme TB, Selemogo M, Molefi M. Prevalence and associated risk factors of scabies and impetigo: A cross-sectional study in Tutume district, Botswana. PLoS Negl Trop Dis. 2024;18(6):e0011495. https://doi.org/10.1371/journal.pntd.0011495
19. Bista RB. Trend and Forecasting Analysis on Climate Variability: A Case of Nepal. J Adv Res Civil Env Eng. 2019;6(1):1-10.
20. Liu JM, Wang HW, Chang FW, Liu YP, Chiu FH, Lin YC, et al. The effects of climate factors on scabies. A 14-year population-based study in Taiwan. Parasite. 2016;23:54. https://doi.org/10.1051/parasite/2016065
21. Gholami Z, Saaid Dayer M, Azarm A. Pediculosis and Factors Affecting Its Prevalence among Schoolchildren in Amol City, Northern Iran. J Arthropod Borne Dis. 2024;18(1):57-67. https://doi.org/10.18502/jad.v18i1.15672