

Prevalence of Fungal Infections to the Human Population of District Buner

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ABSTRACT

Aims: The current study is conducted to determine the prevalence of fungal skin infection to the human population of district Buner, Khyber Pakhtunkhwa, Pakistan.

Methods: In the current study we investigate 470 patients containing the fungal skin infection in the seven tehsil of District Buner.

Results: During the study there are three major infections we investigate which is present in District Buner among the fungal skin infections and it's are the following, Tinea infection, Candidiasis infection and Pityriasis versicolor infection. . The Tinea consists of tinea capitis, tinea faciei, and tinea corporis, tinea cruris, tinea pedis and tinea Unguium.

Practical Implication: The fungal skin infection is more common in this tehsil because of their humidity. We also reported the mode of the transmissions and as will is the cause of fungal skin infections in human in district Buner. We reported the proper lab procedure and the treatment of fungal skin infection in human in district Buner.

Conclusion: There are three fungal infections are present one is Ringworm infection about 55% are present and Candidiasis infection and it is about 27% and the Pityriasis versicolor is 18%. We also determined the sub Tinea infection, Tinea Capitis are 35 %, Tinea Faciei is 22%, Tinea Corporis 15%, Tinea Cruris 13%, Tinea Pedis 10%, and Tinea Unguium is 05%. We determine the distributions of fungal skin infection in human with age below the ten years is 25%, above the ten years is 15%, above the twenty years is 15%, above the thirty years is 17% and above the forty years is 18%. We also investigate the ratio and tehsil wise. Tehsil Daggar consist 7%, Tehsil Gagra 8%, Tehsil Gadezai 10%, Tehsil Mandan 25%, Tehsil Chagharzi 20%, Tehsil Amazi 13% and Tehsil Khodokhel 17% is present in District Buner Khyber Pakhtunkhwa, Pakistan.

Keywords: Fungal skin infection, in Human, Prevalence, Buner, Khyber Pakhtunkhwa, Pakistan.

INTRODUCTION

The study of fungi is called mycology. Fungi are remarkable organisms and they constitute a separate kingdom for purposes of classification. Fungi are eukaryotes; they have a membrane surrounding their nucleus. In the course of time more than 69,000 species of fungi have been described while it has been estimated that the total number of fungal species is of the order of 1.5 million¹. The term "superficial fungal infections" refers to infections brought on by pathogenic fungus that are limited to the human hair, nails, epidermis, and mucosa (the study of pathogenic fungi that cause diseases in humans is called medical mycology)². On the skin's surface, particularly in the body's moist regions, healthy fungi can be found. But when dangerous fungus get under the skin, it results in fungal skin infections³. Nearly a billion people are estimated to have skin, nail and hair fungal infections, many 10's of millions mucosal candidiasis and more than 150 million people have serious fungal diseases, which have a major impact on their lives or are fatal⁴. Fungal infections of the skin and nails have been found in the last few decades to affect 20–25% of the world's population, making them one of the most frequent forms of infection⁵. Ringworm infection medically known as dermatophytosis caused by dermatophytes which are highly specialized group of fungi. They affect the superficial keratinized tissue (skin, hair and nails) of man and animals⁶. Infection by dermatophytes, which include the species belonging to the genera *Microsporum*, *Trichophyton* and *Epidermophyton* are common all over the world⁷. These aerobic fungi are in the form of moulds classified into three genera of fungi imperfecti (1) *Microsporum*, (2) *Trichophyton*, and (3) *Epidermophyton*⁸. Dermatophytosis is a major public health challenge in many parts of the world, with tinea capitis being the most predominant dermatophytic infection affecting school children⁹.

MATERIALS AND METHOD

Study Area: District Buner belong to the Malakand Division that's includes in Khyber Pakhtunkhwa (KPK), Pakistan. The Buner

district has a total area of 1865 km² and a population of 506,048 peoples. It is bounded by the swat district on the north, the malakand agency on the west, the mardan district on the south, and the hazara division on the east. The Daggar is the headquarters of district Buner. And District Buner is located between 34°-11' and 34-43' North-Latitude and 72°-13' and 72°-45' East-Longitude¹⁰.



Map of District Buner¹¹.

Statistical Analysis: Data from the records were statistically analyzed using Microsoft Excel 2016 and PAST Software V. 3.2.

RESULTS

The current study was conducted to determine the prevalence of fungal skin infection in Human in District Buner, Khyber Pakhtunkhwa, Pakistan. In the current study we investigate 470 patients containing the fungal skin infection. The current data we collect from different age of patents. The patients having the following fungal skin infection Tinea or ringworm (Dermatophytosis), Candidiasis and Pityriasis Versicolor. The tinea consists of tinea capitis, tinea faciei, and tinea corporis, tinea cruris, tinea pedis and tinea Unguium or Onychomycosis. The

details of skin fungal infection in human in District Buner are given below.

The following fungal skin infection in human we are reported in District Buner Kpk, Pakistan.

Table 1: Distribution of Fungal Skin infections to the Human Population of District Buner

S.No	Infections	Study Area	Reported Area
1	Tinea infection (Ringworm) or Dermatophytosis	District Buner	DHQ Daggar, BMC Daggar, Buner Medical Center & Rahman Medical Center & Shah Medical Center.
Sub infections in Ringworm (Dermatophytosis)			
1.1	Tinea Capitis		
1.2	Tinea Faciei		
1.3	Tinea Corporis		
1.4	Tinea Cruris		
1.5	Tinea Pedis		
1.6	Tinea Unguium		
2	Candidiasis		
3	Pityriasis Versicolor		

Over all ratio of fungal skin infection in human in district buner; during the study there are three major infections we investigate which is present in district buner among the fungal skin infections and it's are the following .

1. Tinea or Dermatophytes (Ringworm) infection
2. Candidiasis infection
3. Pityriasis versicolor infection

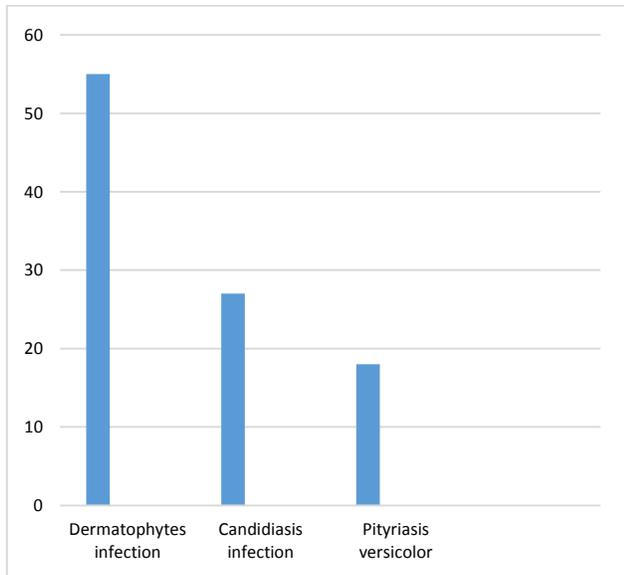


Figure 1: showing the percentage of fungal infection in human in district Buner

The above Figure1.1 shows the prevalence of fungal infection in district buner and one of the tinea or Dermatophytes infection are more frequent in among the fungal infection and about 55% are present and Candidiasis infection are more common in female and children and its distributed about 27% and the Pityriasis versicolor is 18% is present in district Buner.

Distribution of Tinea infections in District Buner: We investigate the tinea infections in district buner. It is about 55% distributed in the whole district among the fungal skin infections. And among the tinea infection the tinea Capitis, tinea facie, and tinea Corporis is more common in children is compared to adults and the remaining infections of the tinea or ringworm such as tinea cruris, tinea pedis and tinea Unguium is common in adults and the tinea pedis and tinea unguium is frequently present in female is compared to male.

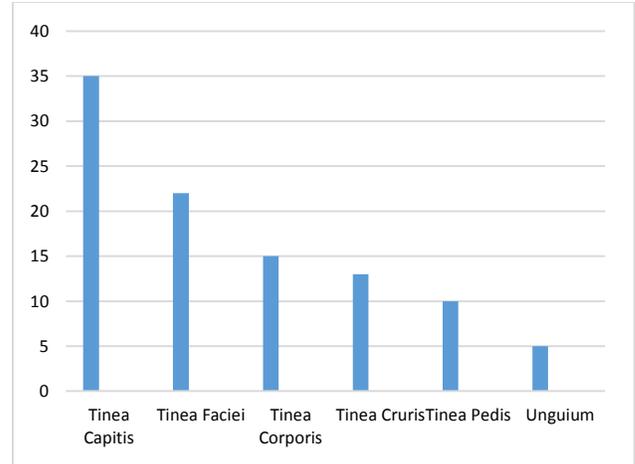


Figure 1: Showing the Percentages of Tinea or Dermatophytes Infections in District Buner.

A tinea (dermatophytes or ringworm) infections are isolated in district Buner about six (6) type of Tinea Infections are present. And its ratio are different from one another about Tinea Capitis are 35 %, Tinea Faciei is 22%, Tinea Corporis 15%, Tinea Cruris 13%, Tinea Pedis 10%, and Tinea Unguium or Unychoomycosis is 05% and among the hole populations of district buner and its overall percentage are shown in Figure 1.2.

Distribution of the fungal skin infection in human with age wise ratio in district Buner: We investigate the occurrence of fungal skin infection in human with age. And age is divided in the subsequent five categories.

1. Below ten years
2. Above ten years
3. Above twenty years
4. Above thirty years
5. Above forty years

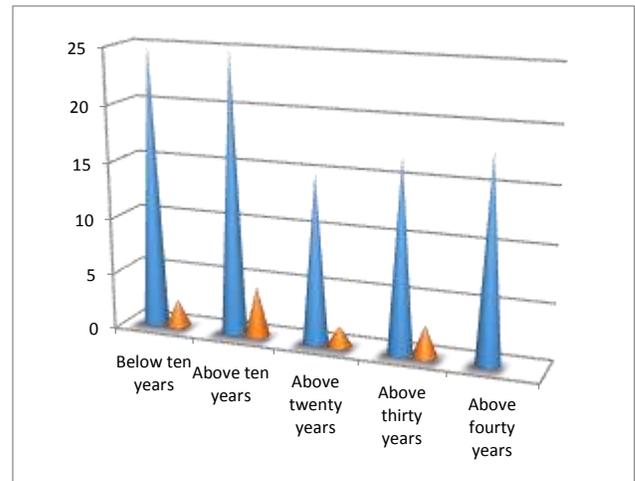


Figure 1: shows the ratio of fungal skin infection in human with age in district Buner

The Figure 1.3 shows the distributions of fungal skin infection in human with age below the ten years 25% , above the ten years is 25%, above the twenty years is 15%, above the thirty years is 17% and above the forty years is 18% is present in district Buner.

Ratio of the fungal skin infection in human in the following Tehsil in district Buner: We investigate the ratio of prevalence of fungal skin infection in human in the following tehsil and it is more

common in Tehsil Mandan, Tehsil Chagharzi and Tehsil Khodokhel among the following tehsils.

1. Tehsil Daggar
2. Tehsil Gagra
3. Tehsil Gadezai
4. Tehsil Mandan
5. Tehsil Chagharzi
6. Tehsil Amazi
7. Tehsil Khodokhel

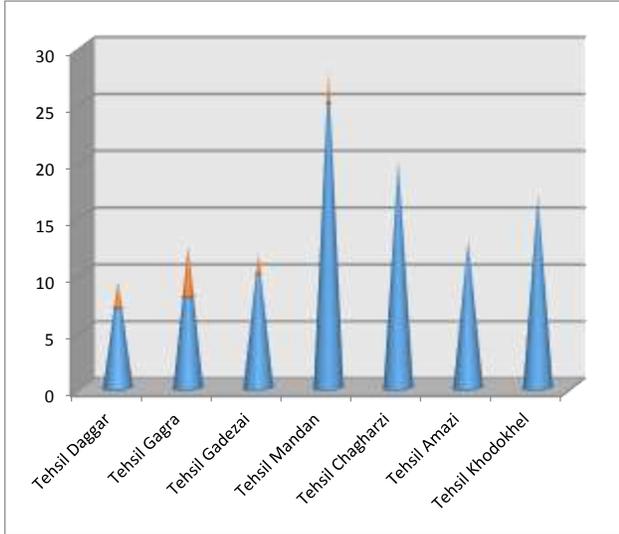


Figure 1: shows ratio of the fungal skin infection in human in different tehsil of district Buner.

The Figure 1.4 shows the ratio of fungal skin infections in human in different Tehsil of district Buner and its ratio is different from each other and Tehsil Daggar consist of about 7%, Tehsil Gagra 8%, Tehsil Gadezai 10%, Tehsil Mandan 25%, Tehsil Chagharzi 20%, Tehsil Amazi 13% and Tehsil Khodokhel 17%.

Patients having the following Tinea or Ringworm infection



Figure 1.5: Kerion



Figure 1.6: kerion



Figure 1.7: Gray patch



Figure 1.8: Black dot



Figure 1.9: Tinea faciei



Figure 1.10: Tinea corporis



Figure 1.11: Tinea pedis



Figure 1.12: Tinea Unguim or onychomycosis

DISCUSSION

The current study was conducted to determine the prevalence of fungal skin infection in Human in District Buner, Khyber Pakhtunkhwa, Pakistan. In the current study we investigate 470 patients containing the fungal skin infection. The current data we collect from different age of patients. The patients having the following fungal skin infection Tinea or ringworm (Dermatophytosis), Candidiasis and Pityriasis Versicolor. The tinea consists of tinea capitis, tinea faciei, and tinea corporis, tinea cruris, tinea pedis and tinea Unguim or Onychomycosis.

We also investigate the overall ratio of fungal skin infection in human in district Buner during the study there are three major infections we investigate which is present in district Buner among the fungal skin infections and it's are the following, Tinea or Ringworm infection 55%, Candidiasis infection is 27% and Pityriasis versicolor infection 18%. The distributions of fungal skin infection in human with age below the ten years 25%, above the ten years is 25%, above the twenty years is 15%, above the thirty years is 17% and above the forty years is 18% is present in district Buner Kpk, Pakistan. We also investigate the ratio of fungal skin infection in human Tehsil wise in District Buner Kpk, Pakistan: The ratio of fungal skin infections in human in different Tehsil of district Buner and its ratio is different from each other and Tehsil Daggar consist of about 7%, Tehsil Gagra 8%, Tehsil Gadezai 10%, Tehsil Mandan 25%, Tehsil Chagharzi 20%, Tehsil Amazi 13% and Tehsil Khodokhel 17%. Between 20% and 25% of persons globally are affected by this illness. Studies from East and Southern Africa suggest that between 20% and 90% of schoolchildren in poor nations have superficial skin fungal infections. 12% to 55% of school-age children in Tanzania have been found to have skin fungal infections, according to prior studies¹². The most prevalent fungal diseases in humans are superficial infections of the skin and nails, which impact 25% (or 1.7 billion) of the world's population¹³. Globally, ringworm may be present in 20% of people at any given moment. In dermatology practise, superficial fungal infections are crucial since they are widespread throughout the world. Dermatophytes are the main causes of these diseases, and they can result with a wide range of clinical symptoms, including tinea corporis, Cruris, capitis, pedis,

and unguium¹⁴. In several countries with high humidity levels, fungus-related skin diseases are a serious public health concern¹⁵.

CONCLUSION

The current study was conducted to determine the prevalence of fungal skin infection in Human in District Buner, Khyber Pakhtunkhwa, Pakistan. In the current study we investigate 470 patients containing the fungal skin infection in the seven tehsil of District Buner. We also investigate the overall ratio of fungal skin infection in human in District Buner during the study there are three major infections we investigate which is present in district Buner among the fungal skin infections and it is the following Tinea infection, Candidiasis infection and Pityriasis versicolor infection. The Tinea consists of tinea capitis, tinea faciei, and tinea corporis, tinea cruris, tinea pedis and tinea Unguim. There are three fungal infections are present one is Ringworm infection about 55% are present and Candidiasis infection and it is about 27% and the Pityriasis versicolor is 18%. We also determined the sub Tinea infection, Tinea Capitis are 35 %, Tinea Faciei is 22%, Tinea Corporis 15%, Tinea Cruris 13%, Tinea Pedis 10%, and Tinea Unguim is 05%. We determine the distributions of fungal skin infection in human with age below the ten years 25%, above the ten years is 25%, above the twenty years is 15%, above the thirty years is 17% and above the forty years is 18%. We also investigate the ratio and tehsil wise. Tehsil Daggar consist 7%, Tehsil Gagra 8%, Tehsil Gadezai 10%, Tehsil Mandan 25%, Tehsil Chagharzi 20%, Tehsil Amazi 13% and Tehsil Khodokhel 17% is present as well as determined the common areas or tehsil are Tehsil Mandan 25%, Tehsil Chagharzi 20% and Tehsil Khodokhel 17% in district Buner, Khyber Pakhtunkhwa Pakistan. The fungal skin infection is more common in this tehsil because of their humidity. We also reported the mode of the transmissions and as will is the cause of fungal skin infections in human in district Buner. We reported the proper lab procedure and the treatment of fungal skin infection in human in district Buner.

Recommendation

- > In future I will determine fungal infections in human in province level.
- > In upcoming study the molecular level of fungal infections in human in district buner.
- > I will aware the people from the causes of fungal skin infection as well as other skin infections.

Conflict of Interest: There is no conflict of interest to any researcher in my fields on fungal skin infections in human.

REFERENCES

- 1 De Pauw BE, (2011). What are fungal infections. *Mediterranean journal of hematology and infectious diseases*, vol. 3.
- 2 Kelly BP, (2012). Superficial fungal infections. *Pediatrics in review*, vol. 33, pp. e22-37.
- 3 Zeb U, Jadoon MA, Jadoon UN, Rehman AU, (2016). To evaluate the fungal skin infestation in human population of central hospital, Rawalpindi.
- 4 Bongomin F, Gago S, Oladele RO, Denning DW, (2017). Global and multi-national prevalence of fungal diseases—estimate precision, *Journal of fungi*, vol. 3, p. 57.
- 5 Oke OO, Onayemi O, Olasode OA, Omisore AG, Oninla OA, (2014). The prevalence and pattern of superficial fungal infections among school children in Ile-Ife, South-Western Nigeria, *Dermatology Research and Practice*, vol.2014.
- 6 Anosike J, Keke I, Uwaezuoke J, Anozie J, Obiukwu C, Nwoke B, (2005). Prevalence and distribution of ringworm infections in Primary school children in parts of Eastern, Nigeria," *Journal of Applied Sciences and environmental management*, vol. 9, pp. 21-26.
- 7 Ansari F, Siddiqui SA, (2006). Prevalence of dermatophytic infections in Karachi, Pakistan during the year 2003-2004, *Pakistan Journal of Botany*, vol. 38, p. 833.
- 8 Uttamchandani PA, Patil AD, (2019). Homoeopathy an alternative therapy for dermatophyte infections, *Int J Health Sci Res*, vol. 9, pp. 316-320.
- 9 Nweze E, Eke I, (2018). Dermatophytes and dermatophytosis in the eastern and southern parts of Africa, *Medical mycology*, vol. 56, pp. 13-28.
- 10 Akhtar N, Ilyas M, Muhammad K, Shams S, Saeed K, Asadullah A, (2016). Prevalence of Hepatitis C virus infections among the general population of Buner, Khyber Pakhtunkhwa, Pakistan, *Biomedical Research and Therapy*, vol. 3, pp. 1003-1017.
- 11 Zahidullah WA, Khan S, Akhtar N, Saeed K, (2016). Analysis of Goral population and its extinction causes in District Buner, Khyber Pukhtunkhwa, *International Journal of Pure and Applied Zoology*, vol. 4, pp. 294-301.
- 12 Chikoi R, Nyawale HA, Mghanga FP, Nyawale H, (2018). Magnitude and associated risk factors of superficial skin fungal infection among primary school children in Southern Tanzania, *Cureus*, vol. 10.
- 13 Bermingham A, Chand M, Brown C, Aarons E, Tong C, Langrish C, (2012). Severe respiratory illness caused by a novel coronavirus, in a patient transferred to the United Kingdom from the Middle East, September 2012, *Eurosurveillance*, vol. 17.
- 14 Atzori L, Pizzatti L, Monica P, (2019). Tinea Infections: Changing Face or Neglected?, *American Journal of Biomedical Science & Research*, vol. 4, pp. 298-304.
- 15 Emele F, Oyeka C, (2008). Tinea capitis among primary school children in Anambra state of Nigeria, *Mycoses*, vol. 51, pp. 536-541.