

Original research Articles

PREVALENCE OF ECTOPARASITES OF INMATES IN THE BAMENDA CENTRAL PRISON, NORTH WEST REGION OF CAMEROON

ABSTRACT:

Background: The purpose of this study was to determine the prevalence of ectoparasites of inmates in the Bamenda Central Prison, Mezam Division, North West Region of Cameroon.

Method: Three hundred and ninety three (385 males and 8 females) inmates aged 16 to 84 years were physically examined in 14 Cells in the prison between September 2014 and February 2015.

Result: Of the 393 inmates physically examined, 335 (85.24 %) were positive for one or more ectoparasites/dermatophytoses. From the results obtained, lice showed the highest prevalence of 76.33%. Dermatophytoses such as scabies 20.86% were also detected. Out of the 385 males examined, 336 (85.49%) had both ectoparasites and dermatophytoses. Amongst females, two were suffering from dermatophytoses. The trend of infection was relatively high in these ectoparasites. For the other parasites, multiple infections were more common than single infections with the adult inmates more infested than the younger ones.

Conclusion: These results showed that ectoparasites/dermatophytoses vary in relation to different Prison Cells and age of the inmates. There should therefore be need to educate the prison population on hygienic habits, reduce overcrowding amongst inmates, in order to fight effectively against these diseases in the Prison Community.

Keywords: Prevalence, Intensity, Ectoparasites, Inmates, Bamenda.

1.0 Background

Ectoparasites are distributed worldwide, particularly in the tropical and sub tropical areas (Morenikeji, 2009). Around the world, a significant percentage of individuals (criminals) enter the prison already infected with ectoparasites which can be transmitted from one person to another. Other people become infected when they visit the prisoners and when they come back home, they can also transmit the infestations to their neighbors. According to

studies carried out by Appleton *et al.*, 1994; Gillespie *et al.*, 2004; 2005, ectoparasites infest individuals living in exposed areas like prisons especially in developing countries. The action of these parasites on man can be translated by the alteration of their health state and the reduction of their reproductive success (Hennessy *et al.*, 1994). Scientific studies according to WHO (1981) have shown that all age and sex groups in prisons suffer from these parasite infestations and other diseases. Infestations are high among populations who are heavily exposed in low income countries, in 720 million clinical cases, an estimate of 135,000 deaths attribute to clinical complications annually (Van Eijk *et al.*, 2009; Smith *et al.*, 2011). It is estimated that 3.5 billion people are infected with these diseases, and that 450 million inmates in the world are ill as a result of these infestations. Studies carried out by Kalu (1994) amongst inmates in Maiduguri, Nigeria revealed that 77 (64.20%) out of 120 inmates are infested every year. This means that inmates in prisons are at a very high risk of becoming infested as some are released, others are being detained at any moment. The high prevalence of these parasites in prisons is promoted by several factors such as poor hygiene and sanitation, overcrowding, sharing of personal belongings, lack of appropriate lodging and medical facilities such as toilets, beddings and portable water in prisons. It is for these reasons that the principal objective of this study was to identify the ectoparasites that infest inmates in the Bamenda Central Prison.

2.0 Methods

2.1 Area of study

This study was carried out between September 2014 and February 2015 in the Bamenda Central Prison found in Bamenda I in the Mezam Division, North West Region of Cameroon. Bamenda I is located between latitudes 5⁰43N and 6⁰10S, and longitude 9⁰55E having a surface area of 110km². It has a total population of 16,000 inhabitants (Bamenda I Council 2013). Bamenda I is bounded to the West by Mbatu Village, to the North by Nkwen and Mankon, to the South by Akum and to the East by Ndjia in Bamenda III Sub Division. The climate of Bamenda is typically tropical with two seasons, the dry season and the rainy season.

2.2 Type of study

A Prevalence study was carried out in the 14 Cells of the Bamenda Central Prison North West Region of Cameroon. The inmates were physically examined for the presence or absence of ectoparasites in all the Prison Cells in the Prison.

63 **2.3 Ethical clearance**

64 To carry out this research, an ethical clearance was obtained from the National Ethics
65 Committee of Cameroon, in order to ensure consent and confidentiality of the participants.

66 **2.4 Study design**

67 A descriptive study was carried out in which inmates were physically examined for the
68 presence of ectoparasites.

69 **2.5 Distribution of Questionnaires**

70 Questionnaires were distributed to the delegates of the different cells at the Infirmary.
71 They were given an already filled sample questionnaire each to study which was taken to the
72 different cells in the evening in order to facilitate the filling procedure of the other
73 questionnaires by the inmates. The questionnaires were brought back the following day and
74 handed to the researcher.

75 **2.6 Collection of questionnaires**

76 Inmates who filled the questionnaire forms and with a signed informed consent were
77 recruited for the study.

78 **2.7 Statistical analysis**

79 Both descriptive and inferential statistical procedures were used. Tables and graphs
80 were used in displaying results. The Chi-square (χ^2) test of independence used to test the
81 hypothesis of whether parasitic diseases infest independent of cells in which inmates were
82 detained and in relation to their ages. The level of significance was 5% test.

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84 **3.0 Results**

85 **3.1 Prevalence of ectoparasites/dermatophytoses in the study area**

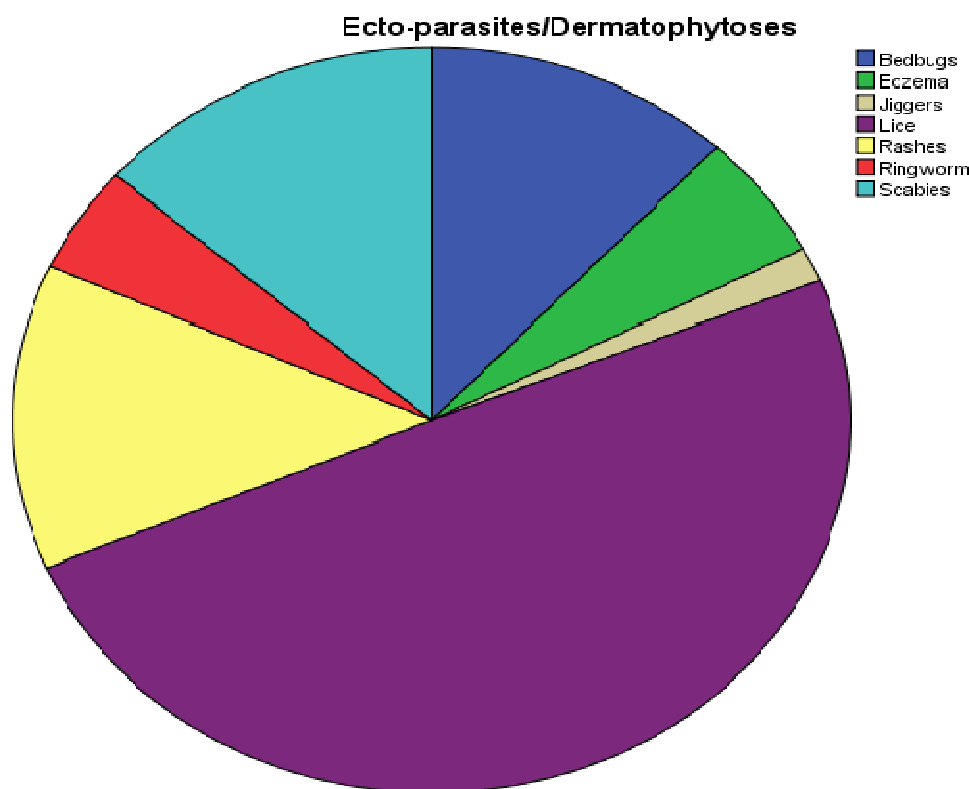
86 Three hundred and ninety three inmates were physically examined by the Prison Nurse
87 and the Principal Investigator for the presence or absence of ectoparasites/dermatophytoses.
88 Three hundred and thirty five of them were infested with ectoparasites/dermatophytoses with
89 an overall prevalence of 85.24%. The following seven types of ectoparasites/dermatophytoses
90 were identified during the study with their respective prevalences; Lice (76.33%), scabies
91 (20.86%), skin rashes(20.35%), bedbugs (18.32%), eczema (8.39%), ringworm (7.12%) and

jiggers (*Tunga penetrans*) (2.29%). The prevalences were significantly different ($P < 0.05$).

The chart below shows the prevalence of the different ectoparasites and dermatophytoses

encountered amongst inmates.

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Figure 1: Prevalence of different ectoparasites/dermatophytoses identified in the Inmates

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3.2 Frequency of association of single, double and multiple ectoparasite infections

Two types of multiple associations (single and double infestations) were identified. Of the 335 inmates infested with ectoparasites/dermatophytoses, 171 had monoparasitism, which was more frequent (43.76%) than double (25.66%) and triple (13.74%) parasitic infestations. Table 1 shows the combinations of different ectoparasitic/dermatophytic associations. In monoparasitic infestation, lice were the most prevalent (38.42%), followed by bedbugs (3.56%) while scabies had a very low prevalence (1.78%). In double associations, several types of combinations were realized: the most prevalent was lice + Dermatophytoses (12.47%), followed by lice + bedbugs (5.85%), lice + scabies (5.59%) and the lowest was scabies + jiggers (0.25%). In triple associations, three types of combinations were realized:

the most prevalent being lice + scabies + Dermatophytoses (6.11%), followed by lice + scabies + bedbugs (2.03%) and the lowest was lice + scabies + jiggers (0.5%).

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Table 1: Prevalence and types of association of single between ectoparasites of inmates.

Type of Parasitism	Number (%) Infested
Monoparasitism	171 (43.76%)
Biparasitisme	101 (25.66%)
Multiple Parasitism	54 (13.74%)
Total	335 (85.24%)
Lice	151 (38.42%)
Bedbugs	15 (3.56%)
Scabies	7 (1.78%)
Lice/Dermatophytoses	49 (12.475%)
Lice/bedbugs	23 (5.85%)
Lice + scabies	22 (5.59%)
Bedbugs/jiggers	2 (0.5%)
Scabies/Dermatophytoses	2 (0.5%)
Lice/jiggers,Scabies/bedbug	1 (0.25%)
Lice + scabies + Dermato	24 (6.11%),
Lice + scabies + bedbugs	8 (2.03%)
Lice/bedbugs/Dermato	7 (1.78%)
Lice/scabies/jiggers	2 (0.5%)
Scabies/bedbugs/dermato	1 (0.25%)
Lice/scabies/bedbugs/dermato	9 (2.29%)
Lice/scabies/bedbugs/jiggers	3 (0.76%)

4.0 DISCUSSION

The seven ectoparasites/dermatophytoses identified may be due to the environment of these inmates, their personal hygiene and certain beliefs (like bathing everyday leads to fever or increases vulnerability to infection) contributed greatly to the high level of infection noticed in this prison community. This study showed that ectoparasites/dermatophytoses were present in inmates from all the fourteen cells of the prison in the study area presenting an infestation rate of 85.24%. Seven ectoparasites/dermatophytoses were identified in this present work with their respective prevalences; lice 76.33%, scabies 20.86%, skin rashes 20.36%, bedbugs 18.32%, eczema 8.39%, ringworm 7.12% and lastly jiggers (*Tunga penetrans*) with 2.29%. The high prevalence of these ectoparasites/dermatophytoses recorded in this present study especially in male inmates could be associated to a good number of factors; Poor personal hygiene of the inmates (most of them don't bath often nor wash their beddings and dresses frequently). Absence of a pressing iron for dresses and beddings after washing. Lack of proper ventilation and sunlight in the cells also provide appropriate conditions for growth and multiplication of ectoparasites. The numerous cracks and crevices on the walls of the cells provide sufficient hiding places for some of the ectoparasites like bed bugs. The closeness of beds (overcrowding) in the prison cells favors cross-infections especially in already immune-compromised persons (Chosidow, 2000; Ello, 2002).

In this study, not all males were infested with ectoparasites/dermatophytoses whereas only two females were infested with ectoparasites/dermatophytoses. The prevalence of ectoparasites/dermatophytoses recorded in females might be because the female's single cell was relatively cleaner, less crowded and less congested than those of the males. The high prevalence of lice, scabies, skin rashes and bedbugs was as a result of the unhygienic conditions of the inmates. This could be because most of the inmates stay for several weeks without changing neither their clothes nor their beddings. The presence of these ectoparasites on the inmates's body may lead to regular scratching of the body as a result of itching. This can cause weeping, bleeding and sometimes secondary infection, as also reported by Abiona *et al* (2010). This makes the individual inattentive, may lead to anemia and sometimes death. Eczema and ringworm recorded a low prevalence in this study. This low prevalence could be because most of the examined inmates were not actually suffering from these two parasites but could be suffering from other diseases. Amongst the male inmates, a relatively very low prevalence was recorded for pubic lice. The low prevalence might be associated with the fact that, in contrast to other ectoparasites encountered which need close contact of dresses or

body for transmission, pubic lice requires inmate contact (Wendel and Rompalo, 2002). In addition, the prohibition of intimate contact among inmates resulted to the low prevalence documented for pubic lice. Head lice were still present even though all the male inmates had very low hair. Body lice were also present and were the most prevalent of all the lice identified. The fleas species recorded in this study was jiggers (*Tunga penetrans*) with a very low prevalence. However, this species is endemic in Sub-Saharan African countries; (Wall and Shearer, 2001). The low prevalence of these fleas registered was probably because this species is at the level of extinction. Furthermore, a significant difference ($P<0.05$) in prevalence of lice (76.3%), scabies (20.8%), skin rashes (20.3%), bedbugs (18.3%), eczema (8.4%), and ringworm (7.12%) was noted between the different prison cells, with cells A to F having a slightly higher prevalence of lice than the other cells. This is probably due to overcrowding in these cells as compared to the other cells in the prison. Wall and Shearer, (2001) indicated that high prevalence and intensity of infestation was due to close physical contact between individuals. Thus, overcrowding amongst the inmates provides the microclimate for easy transmission and survival of lice species and other skin infections from the infected to the uninfected inmates.

Conclusion

The present investigation was designed to study the prevalence ectoparasites of inmates in the Bamenda Central Prison (Mezam Division). It is worth noting that the prevalence of ectoparasites was relatively very high. This present investigation showed that lice had the highest prevalence, followed by bedbugs and lastly by jiggers. The prevalence of dermatophytoses decreased from scabies, skin rashes to eczema and then to ringworm. Ectoparasitic infestations varied between the various age groups. The age infectivity varied within the ages and prison cells with high rates in adult male's Cells and very low rates in the single female Cell. This is linked to a good number of extra activities which is relatively accounted in males than in females, which increases their risk of infection. The result underscored the importance of proper hygiene and sanitation in the prison as this will reduce the infestation rate.

Competing interests

We declare that we have no conflict of interest.

Acknowledgements

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