

Prevalence of Jigger Flea (*Tunga Penetrans*) Infestation amongst Age Groups, Male and Female Persons in Jinja District, Eastern Uganda

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Abstract: Jigger flea infestations are endemic in several rural communities in Uganda. The Eastern part of the country reports outbreaks of jigger infestations. This case study was carried out to identify the most vulnerable sex and age groups to jigger infestation so that appropriate control measures can be recommended. Members of the affected communities in Jinja district were requested to report households that had current cases of jigger infestation. The name, sex and age of the household heads and infected persons were recorded. Details of the persons were then removed from the lists for ethical reasons. A total of 429 persons were reported to be infested with jiggers in nine parishes of five sub-counties in the district. There was a significant difference in jigger infestation in different age groups ($p=8E-152$, $\chi^2 = 712.79$) and between males and females ($p=2.88E-8$, $\chi^2=30.78$). The most infested age group (n, %) was below 15 years (269, 62.7%), followed by the elderly people, above 55 years (48, 11.2%) and the least infested age group was 16-25 years (8, 1.9%). Males in each age category were at least twice more infested with jiggers than females. The study recommends that more attention be focused on children, elderly persons and males in jigger control than on females and persons in other age groups.

Keywords: Age, jigger, infestation, female, male

1. Introduction

Jigger flea infestation, also known as *Tungiasis*, is one of the diseases that affects impoverished communities in the tropical regions and receives considerably less attention compared to other diseases.[1]. *Tungiasis* is caused by the female jigger fleas that burrow into the skin of a person to lay eggs[2]. The insect bulges with eggs to the size of a pea. Penetration of the flea causes wounds, itching and pain. The wounds provide avenue for entry of other secondary pathogens such as tetanus[3], [4]. In severe cases, *Tungiasis* can cause loss of toes and fingers.[1], [5].

Infestation with jiggers is associated with low socioeconomic status of the local community [5], [6]; Poor housing conditions, sanitation, hygiene and negligence perpetuate jigger infestation[7].

Several parts of Uganda are infested by jiggers with the most affected communities occurring in the Eastern part of the country[8]. Jinja is one of the districts in Eastern Uganda affected by jigger infestation and the affected communities comprise typically of peasants involved in subsistence farming [8], [9].

The Government of The Republic of Uganda committed resources to control neglected tropical diseases in the country [10, 11]. However, the interventions are faced with a number of challenges that include inadequacy of funds and human resource. Therefore, this survey sought to identify the most vulnerable persons to jigger infestation so as to prioritize actions[11]. Such knowledge of the most vulnerable persons enables interventions to be targeted in the face of limited

resources. Hence the most vulnerable age groups and sex to jigger infestation in Jinja District were identified in this study.

2. Materials and Methods

This was a community participatory survey where members of communities in Jinja district were gathered in meetings to identify jigger flea infested households and other health related issues. The Village Health Teams (VHT's) educated members on good sanitation and hygiene practices to prevent jigger infestation.

The meetings were conducted in nine parishes from five sub-counties in Jinja district, namely: Itakaibolu, Bugobya, Nalinaibi, Nabitambala and Kisasi parishes in Busedde sub-county, Budima in Butagaya sub-county, Wanyange in Mafubira sub-county, Butamira in Buyengo sub-county and Kibibi in Budondo sub-county.

Community members were requested to report details of households that had cases of current jigger infestation. For each household reported, details of the persons infested with jiggers were given; The name and occupation of the household head as well as the name, sex, religion, level of education of the affected persons. The names of the persons were later removed during data analyses for ethical reasons. Prevalence of jigger infestation by gender and age categories were presented using pie-chart, bar and line graphs with chi-square (χ^2) statistics used to test significant differences in infestation across the demographic divides at $p<0.005$, and 95% confidence level.

3. Results

A total of 429 cases of people infested with jigger fleas were reported in nine parishes from five Sub-counties in Jinja District. Most cases 207 (48.3%) of jigger infestation were reported from Busedde sub-county in five parishes of Itakaibolu, Bugobya, Nalinaibi, Buyengo and Kisasi. Others were: Buyengo Sub-county 109 (25.4%) in Butamira parish, Butagaya Sub-county 53 (12.4%) in Budima parish, Mafubira Sub-county 42 (9.8%) in Wanyange parish and Budondo Sub-county 18 (4.2%) in Kibibi parish respectively (Figure 1).

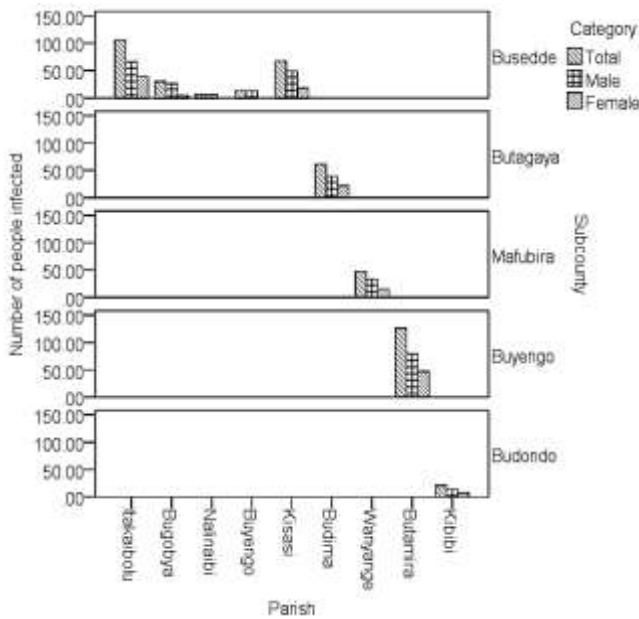


Figure 1: Number of people infested with jiggers per Sub-county and parish

Jigger infestation among the people significantly varied in different age categories ($p=8E-152$, $\chi^2 = 712.79$). The most affected age group (n, %) were below fifteen years (269, 62.7%), followed by those above 55 years of age (48, 11.2%) while the least infested age category was 16-25 years (8, 1.9%) as shown in Figure. 2.

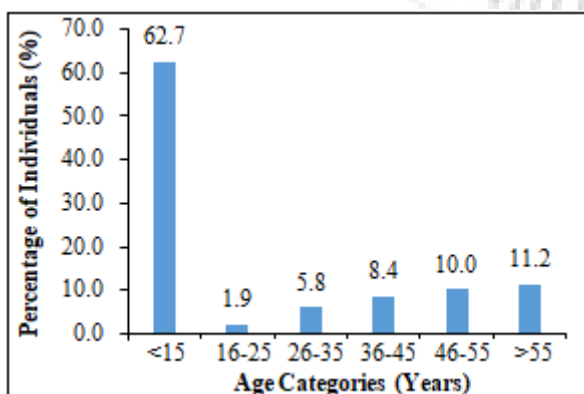


Figure 2: Percentage of persons infested by jiggers in different age categories

There was significant difference in jigger infestation between males and females ($p=2.88E-8$, $\chi^2=30.78$). Males had higher overall prevalence of jigger infestation than females. A total of 292 (68%) males in all age categories were infested

with jiggers compared to females, 137 (32%) as shown in figure 3.

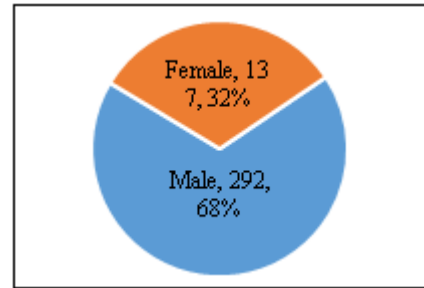


Figure 3: Number and percentage of males and females infested with jiggers

Males in each age category were more infested than females (Figure 4) by approximately twofold in most of the age groups (<15, 16-25, 46-55, >55 years) while males in some age ranges (26-35, 36-45 years) were about thrice more infested than the females. Hence on average, males were twice more infested with jiggers than the females in the various age categories.

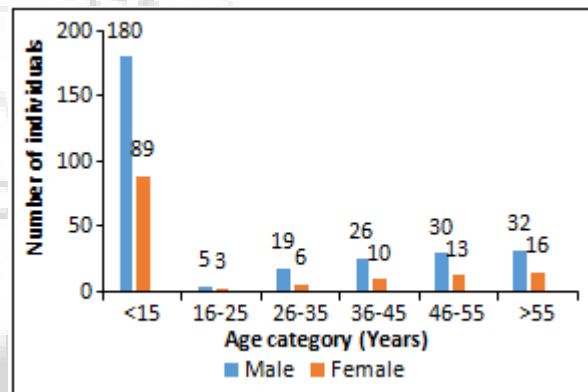


Figure 4: Number of males and females infested with jiggers in different age categories

The lowest ratio in jigger infestation between males and females of 1.7 occurred amongst the least infested age group of 16-25 years while the highest jigger infestation ratio between males and females (3.2) occurred in the second least infested age category of 26-35 years. The most infested age categories of <15 and >55 years each had a ratio of 2.0 (Figure. 5).

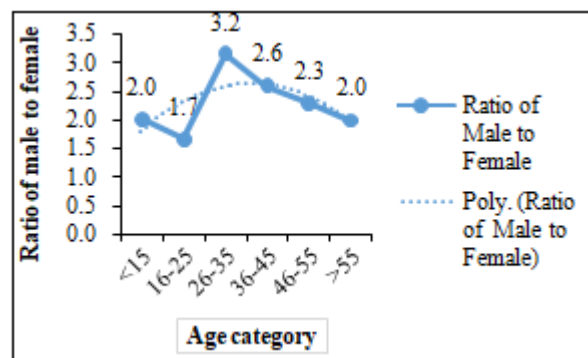


Figure 5: Jigger infestation ratio between males and females in different age categories

4. Discussion

The chance of getting infested with jiggers in the affected communities in Jinja district is related to the age and sex of a person. Children and the elderly are more infected with jiggers than the other age groups while male persons are twice more likely to get infected by jiggers than the females. Similar results were reported amongst school children in South-Western Nigeria where boys were found to be more infected by jiggers than girls [12]. The underlying reasons for the observed differences in jigger infestation among the sexes and ages were not studied in this present survey but are known to be related to behavioural differences and abilities of individuals in preventing and treating jigger infestations.

A study in resource poor communities in Northeast Brazil found out that mothers were the ones involved in treatment and providing knowledge on Jigger prevention and treatment [5]. This can partly explain why females of all age groups were less likely to be infested with jiggers than the males in Jinja district, since girl children are more likely to receive more attention and skills from the mothers than the boys. However, this fact needs to be verified in the jigger endemic area of Eastern Uganda.

Children tend to play in the dusty environments that exposes them to jigger infestations and lack necessary skills to maintain good sanitation and hygiene practices to extirpate embedded fleas out of the skin. The elderly are likely to have poor eye sight which is necessary to remove jiggers from the skin [5]. Furthermore, elderly people and children tend to neglect good sanitation and hygiene practices more than the other age groups. Poor quality of life, especially for elderly is as a result of the negative effects of aging that creates dependency on other people for their health needs [13].

Differences in healthcare seeking behaviour between men and women has implications on access, prevention and treatment of health problems; Men tend to delay and are less keen in observing good hygiene practices than women [14]. This behaviour could account for men being more infested with jiggers than women.

5. Conclusion

There is high jigger infestation in Jinja district in Eastern Uganda. A significant difference exists in jigger infestation among different age groups and between male and female persons. Children are most infested followed by the elderly and male persons are at least twice more infected with jiggers than females. The findings of this study adds to the body on knowledge to target jigger prevention and control in Uganda.

6. Recommendations

In jigger control interventions, children and the elderly need to be targeted. Similarly, a keener focus needs to be paid on male persons of each age category than the females. There is need to provide scientific basis for the observed fact that males of all age categories were more infested than the females in this area.

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