

INCIDENCE OF ZONOTIC HELMINTH PARASITES IN NON - HUMAN PRIMATES AT THE ZOOLOGICAL GARDEN OF UNIVERSITY OF NIGERIA, NSUKKA, SOUTH EAST NIGERIA

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ABSTRACT

Facial samples were collected from six apparently healthy monkeys and three chimpanzees kept at the University of Nigeria, Nsukka, Zoological Garden in South East Nigeria and screened for ova of zoonotic helminths. The result revealed that the non-human primates were infected with Strongyloides, Trichuris and Ascaris species. Importance of this discovery to the health of students, staff and visitors to the zoo and measures that could be taken to prevent the threat to human health were discussed.

Keywords: Zoonotic Helminths, Zoo Primates, Nsukka, Nigeria

INTRODUCTION

Non-human primates, including monkeys and chimpanzees are usually kept in zoological gardens for purposes of research, recreation and conservation. The non-human primates have very fascinating characteristics and behaviours and as such are kept in zoological gardens for purposes of tourism and recreation. However, many of these wild animals are endangered species. So, it is necessary to monitor their health status to justify their continued confinement in zoological gardens.

Study of infections of the non-human primates is also important because their physiology and anatomy are close to that of man. For instance, the brain of man and that of Rhesus monkeys are organized in a similar pattern [1] while neuroanatomical studies of non-human primates have been used to demonstrate how human beings see [2]. Rhesus monkeys and the African vervet monkeys have been used to study poliomyelitis [3]. Monkey kidney cells are also used for virological isolation and study of other human pathogens [3].

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Investigation of the gastrointestinal helminths of green Monkeys in the Barbados revealed a prevalence of 88.7 % [4]. The parasites involved included *Strongyloides* (62.4 %), *Physaleptera* (58.5 %), *Trichuris* (52.8 %), hook worms (34 %), *Oesophagostomum* (30.26 %) and *Trichostrongylus* (3.8 %) species. Polyparasitism was present in 92.5 % of the monkeys studied.

It has also been reported that monkeys are natural reservoirs of human gastrointestinal helminths [5]. In Saudi Arabia, 30 % of baboons were infected with gastrointestinal helminths [6] while 7.7 % of the De Brezzas monkeys in Kenya had various helminth parasite infections [5]. Stuart *et al* [7] reported that 40 % of howling monkeys in Costa Rica were infected with helminths and that 64.4 % of the non-human primates studied harboured *Strongyloides fullerboine* (44.8 %), *Trichuris trichiura* (63.5 %), *Oesophagostomum sp* (15.2%), *Trichostrongylus sp* (23.2 %), *Enterobus vermicularis* (14.0 %), *Schistosoma mansoni* (4.3 %) and *Streptepharaghs sp* (12.6 %). On the Indonesian Island, 59.1 % of pet Macaques were infected with helminths. Mountain gorillas in Ruwanda were infected with *Strongyle/Trichuris trichiura* [8]. The human pinworm, *Enterobus vermicularis* has also been diagnosed in a 26 year old chimpanzee in Japan [9]. From the foregoing, it is evident that people who visit, live close to or work in zoological gardens and those who research with wild captive primates are at risk of contracting helminth infections from the primates.

Prevalence of helminth infections of the primates appears to vary according to locality [4]. Therefore, there is need to study prevalence of helminths in non-human primates found in different localities of the world. In this study, faecal samples from apparently healthy monkeys and chimpanzees kept at the zoological garden of University of Nigeria, Nsukka, South East Nigeria, were screened for ova of helminth parasites.

MATERIALS AND METHODS

Faecal samples were collected from all the 3 chimpanzees and 6 monkeys kept in the Zoological garden of University of Nigeria, Nsukka, Southeast Nigeria. The animals were restrained and a gloved finger was inserted into rectum of each animal to collect the faeces. The faeces were immediately deposited into appropriately labeled sterile containers. For the investigation, 2 g of each faecal sample was examined for helminth eggs by the simple floatation technique with saturated salt solution as the floating medium [10]. Helminth eggs were identified morphologically using their sizes and shapes.

RESULTS

The results, showed that out of the 6 monkeys examined during the period, 2(33.3%) each, were shedding eggs of *Ascaris*, *Strongyloides* and *Trichuris species* in their faeces (Table 1). Among the 3 chimpanzees, 2(66.7%) and 3 (100%) had *Ascaris* and *Srongyloides* eggs while none had eggs of *Trichuris* in their faeces. The microscopic examination also suggested that egg counts were generally very low in both the monkeys and the chimpanzees.

Table 1: Incidence of ova of zoonotic helminths in faeces of apparently healthy primates at the University of Nigeria zoological garden, Nsukka, Nigeria.

Primate	Number examined	Number (%) infected			Egg counts/gram of faeces		
		<i>Ascaris</i>	<i>S'loides</i>	<i>Trichuris</i>	<i>Ascaris</i>	<i>Strongyloides</i>	<i>Trichuris</i>
All primates	9	4 (44.4)	5 (55.6)	2 (22.2)	3 ± 2.2	8.4 ± 9.4	2.5 ± 0.7
Monkeys	6	2 (33.3)	2 (33.3)	2 (33.3)	1.5 ± 0.7	11.5 ± 14.8	2.5 ± 0.7
Chimpanzees	3	2 (66.7)	3 (100)	0	4.5 ± 2.1	5.3 ± 6.7	0

DISCUSSION

Helminths of non-human primates which are of zoonotic importance include *Ascaris lumbricoides*, *Strongyloides stercoralis*, *Trichuris trichiura*, *Ancylostoma duodenale* and *Trichostrongylus spp* [11]. *Enterobius vermicularis*, *E. anthropithec* and *Hymenolepis nana* have also been reported to be zoonotic [12]. Presence of some of these parasites in non-human primates in the University of Nigeria zoological garden is of serious public health significance.

All the three parasite species recovered during this study are pathogenic and have been reported to cause disease in man and in other primates. *Strongyloides spp* have two modes of infection and infect their hosts when the third stage larvae actively penetrate the intact skin or are ingested by the host [13]. *Trichuris trichiura* inhabit the cecum and large intestines of susceptible animals and humans. Under optimum conditions, the eggs when deposited become infective in 3 - 6 weeks. Following ingestion, the eggs hatch to release the larvae that mature to adults in about a month. *Ascaris lumbricoides*, apart from depriving its hosts of nutrients, can create ulcers and perforations resulting in peritonitis. They may also cause intusception or blockage of the intestinal lumen [14].

The presence of eggs of these zoonotic helminthes in faeces of primates in the zoo is a public health hazard to both people who work in and those who visit zoological gardens. Therefore, both the students, tourists, animal handlers and the veterinary practitioners who treat animals in the zoological gardens are at risk of contracting these infections.

Good hygiene practices such as, routine washing of hands after examination of the primates and avoidance of eating and drinking while in non-human primate facilities are recommended, as measures to prevent human infections [13]. Routine anthelmintic treatment of the non-human primates should also be adopted [15].

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