

**PREVALENCE OF GASTROINTESTINAL HELMINTH PARASITES (GIHP) OF DOGS PRESENTED AT THE UNIVERSITY OF NIGERIA VETERINARY TEACHING HOSPITAL (UNVTH) BETWEEN 1994-2002**

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**SUMMARY**

Records of 908 and 739 dogs investigated for Gastro-intestinal Helminth Parasite (GIHP) at the University of Nigeria Veterinary Teaching Hospital, UNVTH for the periods 1994-2002 and 1985-1993 respectively were studied to determine the type of GIHP commonly encountered, the influence of Age, Season, Sex, Breed, Environment (Residence) and Study Time Interval on their prevalence. *Ancylostoma caninum*, *Toxocara canis* and *Dipylidium caninum* accounted for 135 (14.87%), 67 (7.38%) and 17 (1.87%) respectively between 1994-2002 187 (25.30%), 104 (14.07%) and 77 (10.42%) respectively between 1985-1993. There was a strong association between the age-group, breed, study time interval and environment (residence) respectively with the Prevalence while the variation in sex and season was not significant ( $P>0.05$ ). The Public Health importance of these GIHP of dogs are discussed and recommendations to facilitate similar retrospective studies are made.

**KEY WORDS:** Gastrointestinal, Helminths, Dog, *Ancylostoma*, *Toxocara*, *Dipylidium*

**INTRODUCTION**

The population of dogs as the most common pet and sentinel animal globally had been on a steady increase (Kornbalt and Schantz, 1980). Incidentally they constitute an important factor in parasitic zoonoses as a result of this close association with man. Gastrointestinal helminth parasite of dogs had been highlighted to be of major public health importance in the tropics (Ezeokoli, 1984). Geophagy, common with children in developing countries, constitute a major factor in the transmission of these parasites (Etim and Akpan, 1999). About 35% mortality incurred by commercial kennels in North America had been attributed to

Gastro-intestinal helminth parasites (Hendrix & Blagburn, 1983). In Nigeria, various studies had reported high prevalence of GIHP in dogs (Dada and Belino, 1979 and Umoh and Asake, 1982 in Zaria; Bobade and Olufemi, 1979 in Ibadan). High number of dogs roaming the street of a town with the consequent faecal contamination of the environment had been reported (Omodu *et al.*, 2003). The poor social status of most Nigerian dog-owners which predisposes the animals to straying and food-scavenging had been identified as a major contributing factor (Oduye, 1984).

The University of Nigeria Veterinary Teaching Hospital handles cases brought by the resident staff dog-owners as well as

others from members of the public in Nsukka and environs. It is also an established referral centre for veterinary cases in the Southeast zone of the country. The objective of this retrospective study therefore is to determine the influence of Age, Sex, Breed; Season & Environment (Residence) on the GIHP of dogs presented at the hospital and also to compare the findings with the result of a similar work done for the period 1985-1993.

**MATERIALS AND METHODS**

Faecal samples of dogs presented at the UNVTH are investigated for parasitic infections at the Department of Parasitology & Entomology Laboratory. Freshly voided faeces or samples collected per rectum in sterilized universal bottles are examined immediately for parasite, ova, cysts or segments by salt floatation and/or centrifugation techniques as described by (Soulsby, 1982). The result of the investigation for each dog is forwarded to the UNVTH on a prescribed Laboratory

Request Form. The comprehensive case record kept in the Hospital's Record Office contains among others the Dog-Owners Name, Age, Sex, Breed & Residence of the dog. These were pooled for 1994-2002 for the present study data.

The GIHP prevalence in dogs presented at the hospital in 1985-1993 was extracted from the body of a DVM Project (Ugwu, 1993). This was compared with the recent findings to determine the trend of the reported cases. Results were subjected to statistical analysis using Chi-Square test.

**RESULTS**

A total of 908 dogs investigated for gastrointestinal parasites in 1994-2002 yielded 219 (24.12%) positive cases for gastrointestinal helminth parasites of dogs. *Ancylostoma caninum* accounted for 135 (14.87%); *Toxocara canis* 67 (7.38%) and *Dipylidium caninum* 17 (1.87%) (Table I.) Dogs with more than one species of the helminth are taken as one positive case.

**TABLE I: Prevalence of gastrointestinal helminth parasite infections of dogs presented at UNVTH in 1994-2002 by age, sex and breed**

| GIHP                       | *Age (months)  |               |               |                | Sex            |                |                | *Breed         |               |               |                |
|----------------------------|----------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|---------------|---------------|----------------|
|                            | 0-6            | 7-12          | >12           | Total          | Male           | Female         | Total          | Local          | Exotic        | Cross         | Total          |
| <i>Ancylostoma caninum</i> | 36<br>(9.00**) | 39<br>(21.42) | 60<br>(18.4)  | 135<br>(14.87) | 69<br>(14.59)  | 66<br>(15.17)  | 135<br>(14.87) | 77<br>(12.05)  | 26<br>(19.70) | 32<br>(23.36) | 135<br>(14.87) |
| <i>Toxocara canis</i>      | 46<br>(11.50)  | 7<br>(3.85)   | 4<br>(1.22)   | 57<br>(1.87)   | 35<br>(1.06)   | 32<br>(2.76)   | 67<br>(1.87)   | 49<br>(1.72)   | 7<br>(0.76)   | 4<br>(3.65)   | 60<br>(1.87)   |
| <i>Dipylidium caninum</i>  | 5<br>(1.25)    | 4<br>(2.19)   | 8<br>(1.22)   | 17<br>(1.87)   | 5<br>(1.06)    | 12<br>(2.76)   | 17<br>(1.87)   | 11<br>(1.72)   | 1<br>(0.76)   | 5<br>(3.65)   | 17<br>(1.87)   |
| Total                      | 87<br>(21.75)  | 50<br>(24.47) | 72<br>(22.08) | 209<br>(23.02) | 109<br>(25.52) | 111<br>(24.12) | 219<br>(21.44) | 137<br>(25.76) | 34<br>(29.93) | 41<br>(29.93) | 212<br>(23.35) |

\*Ten (10) and seven (7) positive cases had no age and Breed records respectively

\*\*Calculated relative percentages of the positive cases are in parenthesis

Similarly *Ancylostoma caninum*, *Toxocara canis* and *Dipylidium caninum* accounted for 187 (25.30%), 104 (14.07%) and 77 (10.42%) respectively of the infections in the 739 cases investigated between 1985-

1993 (Table II). The infection among the dog Age-groups of 0-6, 7-12 and above 12 months showed a strong association (P<0.01) for *Ancylostoma caninum* and *Toxocara canis* while the sex of the dog

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had no significant association ( $P>0.05$ ) with any of the three helminth infections in 1994-2002. However, the Breed of dog had a strong association only with *Ancylostoma caninum* infection where the local breed was the least infected. (Table I). There was no significant difference ( $P>0.05$ ,) between the positive cases recorded for the UNN campus and off-campus resident dogs (Table II). Significantly higher prevalence,

( $P<0.01$ ), were observed in 1985-1993 than in 1994-2002 for all the three helminth species, (Table II). The monthly prevalence of the three helminth infections between 1994-2002 is represented in Figure 1. No statistical difference between the Rainy and Dry Season months were observed. Ten and seven cases had no record of Age and Breed respectively.

**TABLE II:** Prevalence of gastrointestinal helminth parasite infections of dogs presented at the UNVTH in 1994-2002 by Environment (Residence) and the study period

| GIHP                       | Residence   |             |             | Study period |             |             |
|----------------------------|-------------|-------------|-------------|--------------|-------------|-------------|
|                            | On Campus   | Off Campus  | Total       | 1985-1993    | 1994-2004   | Total       |
| <i>Ancylostoma caninum</i> | 49 (18.02*) | 86 (13.52)  | 135 (18.40) | 187 (25.30)  | 135 (14.87) | 322 (19.55) |
| <i>Toxocara canis</i>      | 25 (9.19)   | 42 (6.60)   | 67 (7.35)   | 104 (14.07)  | 67 (7.38)   | 171 (10.38) |
| <i>Dipylidium caninum</i>  | 3 (1.10)    | 14 (2.20)   | 17 (1.87)   | 77 (10.42)   | 17 (1.87)   | 97 (5.71)   |
| Total                      | 77 (28.31)  | 142 (22.32) | 219 (24.12) | 368 (49.80)  | 219 (24.12) | 587 (35.64) |

\*Calculated relative percentages of the positive cases are in parenthesis

### DISCUSSION

The overall prevalence of gastrointestinal helminth parasite of dogs observed in 1994-2002 was significantly less at 24.12% than the value of 49.80% observed between 1985-1993 (Ugwu, 1993). This may be attributed to the increasing number of primary and secondary levels of animal care services evidenced in the higher number of private veterinary outfits established in Nsukka town and environs, from about three (3) in 1985 to over twenty (20) in 2002. Also the advent of the 'wonder drug' IVOMEC, about the late 80's had been receiving greater acceptability among clinicians and pet-owners for its highly effective antihelminthic activity with minimal side effects over the years to the present. The higher prevalence of *Ancylostoma* species in older dogs may be due to its mode of transmission where the per cutaneous route is more common with adult dogs that roam

or scavenge around. This finding agrees with Bobade and Olufemi (1979), Umoh and Asake (1982) and Dada *et al.* (1979). However, *Toxocara* species was more prevalent in younger puppies. And this is of utmost public health importance because of its zoonotic implication in the pathogenesis of Visceral Larva Migrants (VLM) in man especially among children who are traditional playmates with puppies (Sprent, 1958; Dada and Belino, 1979; Ezeokoli, 1984; Schantz and Glickman, 1979; Cypress, 1985 and Omudu *et al.*, 2003).

*Dipylidium* species consistently exhibited the least prevalence in all cases. This may be due to an increased awareness of environmental hygiene in most households coupled with modern housing structures that makes the thriving of the flea (*Ctenocephalides*) intermediate host difficult. The closed endemic focus of infection is thus broken in the transmission cycle.

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There were no significant differences in the prevalence of GIHP with respect to the sex and the seasons perhaps due to the status of UNVTH as a Referral Centre where only intractable veterinary cases should routinely be taken to. Hence some of the reported GIHP cases must have resulted from Ancillary Diagnosis. However, the significantly higher prevalence among the Cross than the Exotic and Local Breeds most probably may be due to the development of environment-based immunity acquired from trickle infections by the Local Breed most of which are scavengers. The Exotic which may be less immuned are usually more treasured and restricted by their owners and so less prone to infection. This agrees with Omamegbe (1980) who posits that the degree of care shown to pets is closely related to the economic status of their owners as well as the cognizance of the owners for such care and on the breed of pet. Sequel to this, though the overall prevalence of GIHP between the on-Campus and off-Campus resident dogs do not differ statistically, the higher rate of *Dipylidium* species infection observed may yet be a reflection of the social and enlightenment status of their owners. The on-Campus residents should obviously occupy a higher stratum than the general population residing off-Campus on this score. This accords with the findings of Fabiyi (1983).

In view of the zoonotic implications of the three GIHP of dogs reported in this study and the importance of stray dog population in the epidemiology of canine diseases in Nigeria, (Anene and Omamegbe, 1987), the Veterinary profession, especially the Public Health arm, should intensify efforts to educate members of the general public and pet-owners on the health hazards that may arise out of improper pet-care procedures. It

may also be stated here that all the established veterinary Teaching Hospitals in the Country should adopt the Computer-based Information Technology (CIT) system in their Record Units for facilitated data Storage and Retrieval, which is not yet the case at UNVTH, for Retrospective Investigations.

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### REFERENCES

- ANENE, B.M. and OMAMEGBE, J.O. (1987): Common diseases of Dog in Nigeria. *Zaria Veterinarian*, **2**: 2
- BOBADE, P.A. and OLUFEMI, B.E. (1979): Prevalence of Gastrointestinal Helminth Parasites of Dogs in Ibadan, Nigeria. *Nig. Vet. J.*, **8**: 68-70.
- CYPRESS, I.H (1985): Visceral Larva Migrans. *Cornell Vet. Journal* **68**: 283-296.
- DADA, B.J., ADEGBOYE, D.S. and MOHAMMED, A.N. (1979): A survey of Gastrointestinal Helminth Parasites of stray Dogs in Zaria, *Nig. Vet. Rec.*, **104**: 145.
- DADA, B.J.O. and BELINO, E.D. (1979): Prevalence and Public Health Significance of helminth ova in dog faeces deposited on streets of Zaria, Nigeria. *Ann. Trop. Med. Parasit.* **73**: 495.

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- ETIM, S.E. and AKPAN, P.A. (1999): Studies on Geophagy as a risk factor for Geohelminthiasis in Calabar, Cross River State, Nigeria. *Nig. J. Parasi.* **20**: 91-98.
- EZEOKOLI, C.D. (1984): Studies on prevalence of Gastrointestinal Parasites in Pet Dogs in Zaria, Nigeria. *Nig. Vet. J.*, **13**: 55-57.
- FABIYI, J. P. (1983): Gastrointestinal Helminths of Dogs on the Jos Plateau, Nigeria. *Trop. Anim. Hlth. Prod.*, **15**: 137-138.
- HENDRIX, C.M. and BLAGBURN, B.L. (1983): Common Gastrointestinal Parasites. *Vet. Clinics N. Amer Small Anim Pract.*, **13**: 627-646.
- KORNBALT, A.N. and Schantz. P.M. (1980): Veterinary and Public Health Consideration in Canine Roundworm control: A survey of Practising Veterinarians. *J. Amer. Vet. Med. Assoc.*, **137**: 1212-1215.
- ODUYE, O.O. (1984): Studies of Canine Hookworm Infection in Ibadan, Nigeria with reference to Age, Sex, Breed & Season. *Nig. Vet. J.*, **13**: 96-101.
- OMAMEGBE, J.O. (1980): A survey of dogs and their owners seen at Two Veterinary Clinics in Enugu & Nsukka Areas of Anambra State, Nigeria. *Nig. Vet. J.* **9**: 10-16.
- OMUDU, E.A.; AMUTA, E.U.; UNOQUR, L.B. and OKOYE, L.A. (2003): Prevalence of *Toxocara canis* ova in dog faeces and soil samples collected from public parks in Makurdi. *Nig. J. Parasit.*, **24**:137-142.
- SCHANTZ, P.M. and GLICKMAN, L.T. (1979): Canine and Human Toxocariasis-The Public Health Problem and Veterinarians Role in Prevention. *J. Amer. Vet. Med. Assoc.*, **175**: 1270-1273.
- SOULSBY, E.J.L. (1982): Helminths, Arthropods and Protozoa of Domestic Animals (7<sup>th</sup> Ed.). Bailliere Tindall, London.
- SPRENT, J.F.A. (1958): Observations on the development of *Toxocara canis*. *J. Vet. Parasit.*, **48**: 184-209.
- UGWU, C.E. (1993): Prevalence of Gastrointestinal Parasites of Dogs visiting University of Nigeria Veterinary Teaching Hospital (UNVTH) from 1985 to 1993. A DVM Project (Unpublished).
- UMOH, J.U. and ASAKE, T.T. (1982): Prevalence of Gastro intestinal helminth parasites of Dogs in Ibadan, Nigeria. *Nig. Vet. J.*, **11**: 2