Prevalence of intestinal parasites among patients of a tertiary hospital in Benin city, Nigeria

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Citation: Akinbo FO, Omorogie RO, Eromwon R, Igbenimah IO, Airueghiomon U-E. Prevalence of intestinal parasites among patients of a tertiary hospital in Benin city, Nigeria. North Am J Med Sci 2011; 3: 462-464. doi: 10.4297/najms.2011.3.462.

Abstract
Background: Intestinal parasitic infections have been described as constituting the greatest single worldwide cause of illness and disease [1]. These infections are associated with poor sanitary habits, lack of access to safe water and improper hygiene, thereby occurring wherever there is poverty [2]. The degree of each factor and the prevalence of infections vary from one region to another [3].

In spite of the prevalence of many risk factors in both rural and urban life predisposing people to parasitic agents, unfortunately, there is limited updated data about current situation of human parasitic infections in Benin City and environs.

Against this background, the present study was undertaken to investigate the prevalence of intestinal parasitic infections, its relationship with sex and age as well as seasons of the year in Benin City.

Materials and Methods
Study Area
The study was carried out in the University of Benin Teaching Hospital, Benin City, Nigeria. The hospital is a tertiary hospital and has a referral status. It is located in the South-South geographical zone of Nigeria. It serves about 6-10 states in Nigeria.

Study Population
The study was carried out within the period of March, 2009 to February, 2010 at the University of Benin Teaching Hospital. A total of 925 patients attending clinics and on admission were recruited for this study. They consisted of 430 (46.49%) males and 495 (53.51%) of females with age ranging from 0–85 years. Patients on
antiparasitic agents as well as those that were HIV seropositive were excluded from this study.

Collection and Processing of Specimens

Stool samples were collected from each patient with signs and symptoms of diarrhea into a clean wide-mouthed container. The samples were examined microscopically for ova and cysts of parasites using saline and iodine mounts on grease-free slides.

Data Analysis

The frequency data were compared using the Chi square (Χ²) test. Odd ratios were calculated for gender and patient's status. The software INSTAT® (GraphPad, USA) was used in all statistical analyses.

Results

Of the 925 patients examined, 3.9% were infected with intestinal parasites. The prevalence of infection was similar between male and female patients (P = 0.548) and between out-patients and in-patients (P = 0.569) (Table 1). The prevalence of infection was higher in age groups ≤ 10 years (7.29%) and ≥ 51 years (7.06%). However, the prevalence of intestinal parasitic infection was age dependent (P < 0.033) (Table 1).

Table 1 Prevalence of intestinal parasites in relation to gender, patients and age

| Characteristics | No. tested | No. Infected(%) | OR | 95% CI | P |
|-----------------|-----------|----------------|----|--------|---|
| Male            | 430       | 19(4.42)       | 1.30 | 0.667, 2.534 | 0.569 |
| Female          | 495       | 17(3.43)       | 0.769 | 0.395, 1.500 | 0.548 |
| Out-patients    | 741       | 27(3.64)       | 0.735 | 0.340, 1.592 | 1.000 |
| In-patients     | 184       | 9(4.89)        | 1.360 | 0.628, 2.945 | 0.569 |
| Age (years)     |           |                |    |        |    |
| ≤ 1 – 10        | 192       | 14(7.29)       |     |        |    |
| 11 – 20         | 100       | 3 (3.00)       |    |        |    |
| 21 – 30         | 289       | 7 (2.42)       |    |        |    |
| 31 – 40         | 188       | 4 (2.13)       |    |        |    |
| 41 – 50         | 71        | 2 (2.82)       |    |        |    |
| ≥ 51            | 85        | 6 (7.06)       |    |        |    |

*α = P<0.05

Table 2 Prevalence of parasitic infections in relation to sex

| Parasite               | Male (%) | Female (%) | Total (%) |
|------------------------|----------|------------|-----------|
| Ascaris lumbricoides   | 11 (52.4)| 8 (50.0)   | 19 (51.4) |
| Hookworm               | 6 (28.6) | 6 (37.5)   | 12 (32.4) |
| Trichuris trichiura    | 3 (14.3) | 1 (4.8)    | 4 (10.8)  |
| Entamoeba histolytica  | 1 (4.7)  | 1 (4.7)    | 2 (5.4)   |
| Total                  | 21 (56.8)| 16 (43.2)  | 37        |

Gender was not a risk factor for acquiring intestinal parasitic infection (P = 0.548). This finding is consistent with previous reports [1, 4, 7]. There was no significant difference in the prevalence of intestinal parasitic infections among out-patients and in-patients (P = 0.569). The reason for this is unclear, as all intestinal protozoa and some helminthes can be acquired nosocomially [10].

The finding that age significantly affected the prevalence of intestinal parasitic infection has been previously reported [1,6]. However, the observation in this study differs from other study. While the prevalence in this study drops from < 10 years to 41 to 50 years age group, before increasing in ≥ 51 years, other studies report increase in prevalence with increasing age and peaks between the age group of 16 to 30 years before dropping [6, 9].

More infections were observed in December than other
months. However, the prevalence of intestinal parasitic infections was not significantly affected by both months of the year and season.

The most prevalent intestinal parasite in this study was *Ascaris lumbricoides* (51.4%), followed by hookworm (32.4%), *Trichuris trichiura* (10.8%) while the least was *Entamoeba histolytica* (5.4%). This finding is consistent with previous reports [6,11-15]. *Ascaris lumbricoides* was the most prevalent parasite among the male (52.4%) and female (50%) patients while hookworm infection was observed more in female (37.5%). More males (14.3%) were infected with *Trichuris trichiura* while similar prevalence of *Entamoeba histolytica* (4.7%) was observed in both sexes. Effective treatment of infected patients and improved sanitary habits is advocated.

## Conclusion

This study concluded that 36 patients were infected with various intestinal parasites and that age significantly affected the prevalence of parasitic infections. Effective treatment of infected patients and improved sanitary habits is advocated.

## Acknowledgement

We acknowledge with thanks the Management of University of Benin Teaching Hospital for permission to carry out this study.

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