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Intestinal Parasitism and Related Risk Factors in the Vicinity of Khurja, Bulandshahr (U.P.)

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ABSTRACT

Intestinal parasitic infections are among the major public health problems in developing countries. Their distribution is mainly associated with poor personal hygiene, environmental sanitation and limited access to clean water. Indeed epidemiological information on the prevalence of various intestinal parasitic infestations in the population of Khurja, Bulandshahr is a prerequisite to develop appropriate control measures. The present study was carried out for the period of 2011 to 2012. A survey was performed on the 377, randomly selected persons from rural and urban populations of Khurja, Bulandshahr and stool samples also collected from these populations. The collected stool specimens were examined microscopically for the presence of eggs, cysts and trophozoits of intestinal parasites, using direct saline smear method for the confirmation of parasitic positive patients. Epidemiological data were analyzed using Chi –Squared test. The prevalence of intestinal parasites was significantly higher (χ^2 = 23.59, df = 3, P = 7.82 at 0.05 level) in low age group, (χ^2 = 12.87, df = 2, P = 5.59 at 0.05 level) in low income group and (χ^2 = 10.58, df = 3, P = 7.82 at 0.05 level) due to illiteracy. In the present study measures including education on personal hygiene, environmental sanitation, water supply and treatment should be taken into account to reduce the prevalence of intestinal parasites. Therefore, the aim of this study was to assess the prevalence of intestinal parasitic infestation and related risk factors among the population of Khurja, Bulandshahr.

Key Words: - Intestinal Parasites, Prevalence, Poverty, Epidemiology.

Introduction

Parasites can be responsible for wide spectrum of ailments, from very serious infections and diseases at one end, to mild feelings of unwellness and lack of energy. Parasites likely infect everyone at some time. It's estimated that as many as 85 percent of the world's population is affected. It's believed some scientist that parasitic infection is more responsible for diseases like cancer, diabetes, liver dysfunction, even HIV infection, and other, than traditionally accepted. The worldwide prevalence of intestinal parasites is estimated in more than 3.5 billion with around 4.5 million clinical cases. [Okey, et al 2004]. Intestinal parasitic infections are governed by behavioral, biological, environmental, socioeconomic and health systems factors. Local conditions such as quality of domestic and village infrastructure; economic factors such as monthly income, employment and occupation and social factors such as education influence the risk of infection, disease transmission and associated morbidity and mortality [Yakuba, 2003 and Wang, 2009]. Human intestinal parasites can be present in any disease, in any person, at any age. People with intestinal parasitic infections are usually under nourished and weak, infected with viral, fungal, or bacteria, and have various types of chemical and metal poisoning. Human intestinal parasites occur throughout the world but it is in the west tropics and sub-tropics where they are found in their greatest numbers. Intestinal parasitic infections such as amoebiasis, ascariasis, hookworm infection and trichiuriasis are among the ten most common infections in the world [WHO, 1987]. A basic requirement for the continued survival of these organisms is an inadequate and unhygienic method of disposal of faecal material.

These infections are the most prevalent in tropical and sub – tropical regions of the developing world where adequate water, sanitation facilities and poor economic conditions are lacking. [Savioli 2004, Cappello, M 2004, Sah and Bhattarai S 2013 and Nxasana et al, 2013]. The conditions required for transmission and aqusion of intestinal parasitism are favored in institutions where large number grouped together for a long period of time and poor sanitary conditions prevail. This is evidenced by studies on the prevalence of intestinal parasites in school, day care centers and institutions. [Souza et al 2010, Okey, et al 2004, Heidari et al 2003, Lee et al 2000, Gatti et al 2000, Rivero- Rodinguer et al 2000]. Local conditions such as quality of domestic and village infrastructure, economic, occupation and social factors such as education influence the risk of infections, diseases transmission and associated morbidity and mortality. [Wang et al 2009, Yakuba et al 2003]. It is observed that about 60 – 80 percent population of certain areas of West Bengal, Uttar Pradesh, Bihar, Orissa, Punjab, East Coast of Tamil Nadu and Andhra Pradesh is infected with parasites [Dutta, 1962]. The global prevalence of parasitic diseases is estimated to be 478 million children for *A. lumbricoides*; 280 million for *hookworms* and 347 million children for *T. trichiura* [Musgroov 1993 and Bethony et al. 2006] Intestinal parasitoses are common both in general population and in people residing in institutions in tropical and sub – tropical regions. [Grandle et al, 2011 and Melo et al, 2010]. World Health Organization (WHO) estimated that approximately 50 million people worldwide suffer from invasive amoebic infection each year, resulting in 40 – 100 thousand deaths annually (WHO, 1997 and Petri, et al. 2000). The purpose of the persent study was to perform an epidemiological survey to determine the prevalence of intestinal parasitic infections in the populations of Khurja, Bulandshahr.

Material and Methods

This research work was conducted on human intestinal parasitic patients and few healthy subjects as control. A survey was carried out from rural and urban populations of Khurja, Bulandshahr, for human parasitic diseases during the period of 2011 to 2012. An interview technique was performed to collect the information of subjects regarding their age, sex and family background. A total of 377, samples of stool from both rural and urban populations were collected for the microscopic investigations in laboratory. The Simple Smear in Saline method [Who 1991] was performed to determine the stool samples. The persons having any cyst/ova/trophozoit/whole parasite were treated as parasitic positive patients. During the Demographic study of persons, the age group, sex, socio-economic and literacy status were included in this study. The Chi –Square tests were performed to significant the test for an association between all possible pairs of parasitic infections and between the genders of each age group.

Results and Discussion

In the present study overall 377 persons from urban and rural population of Khurja, Bulandshahr were surveyed and stool samples also collected of these populations. The collected stool samples were examined microscopically in the laboratory by Simple Smear in Saline concentration method. In the present study the age combination shows that 131 (34.8%) persons were in 0 -15 age group and 103 (27.3%) in 16 - 25 age group, 93 (24.7%) in 26 – 35 age group, while, 50 (13.3%) were above the age of 35 years. The sex based distribution shows that out of 377 samples, the 168 (44.6%) were collected from males and 209 (55.4%) from female. According to socio - economic status, 198 (52.50%) to low (5001 to 15000), 105 (27.9%) to medium (15001 to 25000) and 74 (19.6%) persons to high (<25000) income group. The literacy status shows that 161 (42.7%) were belongs to illiterate, 110 (29.2%) to high school, 71 (18.8%) to intermediate and 35 (9.3%) to graduate and above. In these 377 samples, 123 were diagnosed parasitic positive patients, in which 47.4% positive parasitic patients were from 0 -15, 30.9% from 16 – 25, 13.8% from 26 - 35 and 7.3% from the age above 35 years. Further, sex wise distribution shows that 44.7% positive parasitic patients were male and 55.3% females. Their economic status shows that 61.8%, 28.5%, and 9.7% positive parasitic patients were in low, medium and high

income group respectively, while the literacy status shown that 45.5% positive parasitic patients were illiterate, 34.9% at high school level and 16.3% at intermediate, while the 3.3% positive parasitic patients were at graduate or above level. The results of present study shows that the gastrointestinal parasitic infection was found statistically more significant higher (χ^2 = 23.59, df = 3, P = 7.82 at 0.05 level) in low age group, (χ^2 = 12.87, df = 2, P = 5.59 at 0.05 level) in low income group and (χ^2 = 10.58, df = 3, P = 7.82 at 0.05 level) due to illiteracy. In the unilabiate analysis, no statistically significant association were observed between educational levels. Our findings are the consonance with socio-economic indicators [Iichukwu, et. al. 2010 and Lee, et. al. 2000]. The unsanitary conditions and low age group increased the risk factors for developing intestinal parasitic infections. [Adamu, et al. 2006, Gatt, et. al. 2000 and Heidan, et. al. 2003] In other study revealed that the prevalence of intestinal parasites was high in low age group as compared to other age group. [Aschalaw, et. al. 2013, Kumar et. al. 2013, Kumar et. al. 2015, Kumar 2018, Kumar, 2018 and Kumar 2018]. In the continuation of this study, another study also revealed that the high prevalence of intestinal helminthes shown in the low socio – economic group. [Bhandari, et. al. 1985].

Conclusion

In conclusion, the prevalence of gastrointestinal parasitic diseases appears to be high due to poverty, low literacy status, unhygienic conditions, and lack of proper sanitation, standard of livings, social norms and customs. The present study indicates that a nationwide parasite control project and awareness programs should be arranged time to time at national and international level to reduce the possibility of morbidity and mortality due to parasitic infectious diseases in the world.

Table: 1 – Prevalence analysis for positive patients according to residence gender.

Characteristic Gender	Total Number	Positive (+)	Negative (-)	Prevalence (%)
Urban	153	51	102	41.5
Rural	224	72	152	58.5

χ^2 = 0.022, df = 1, P = 3.84 at 0.05 level

Table: 2 – Prevalence analysis for positive patients according to age group.

Characteristic Age Group	Total Number	Positive (+)	Negative (-)	Prevalence (%)
0 – 15	131	59	72	47.4
16 – 25	103	38	65	30.9
26 - 35	93	17	76	13.8
Above 35 Years	50	9	41	7.3

*χ^2 = 23.59, df = 3, P = 7.82 at 0.05 level

Table: 3 – Prevalence analysis for positive patients according to gender.

Characteristic Gender	Total Number	Positive (+)	Negative (-)	Prevalence (%)
Male	168	55	113	44.7
Female	209	68	141	55.3

χ^2 = 0.006, df = 1, P = 3.84 at 0.05 level

Table: 4 – Prevalence analysis for positive patients according to age economic status.

Characteristic Economic Status	Total Number	Positive (+)	Negative (-)	Prevalence (%)
Low Income (5001 to 15000) group	198	76	122	61.8
Medium Income (15001 to 25000) group	105	35	70	28.5
High Income (<25000) group	74	12	62	9.7

*χ^2 = 12.87, df = 2, P = 5.59 at 0.05 level

Table: 5 – Prevalence analysis for positive patients according to education status.

Characteristic Education Level	Total Number	Positive (+)	Negative (-)	Prevalence (%)
Illiterate	161	56	105	45.5
High School level	110	43	67	34.9
Intermediate	71	20	51	16.3
Graduate & Above	35	04	31	3.3

*χ^2 = 10.58, df = 3, P = 7.82 at 0.05 level

Fig:- 1- Prevalence of gastrointestinal parasitic infection according to residence.

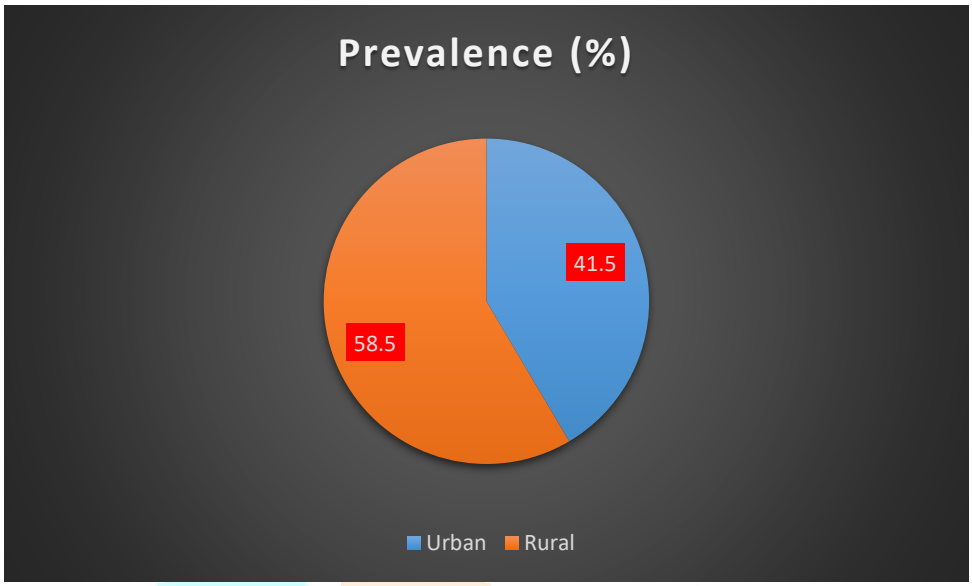


Fig:- 2- Prevalence of gastrointestinal parasitic infection according to age group.

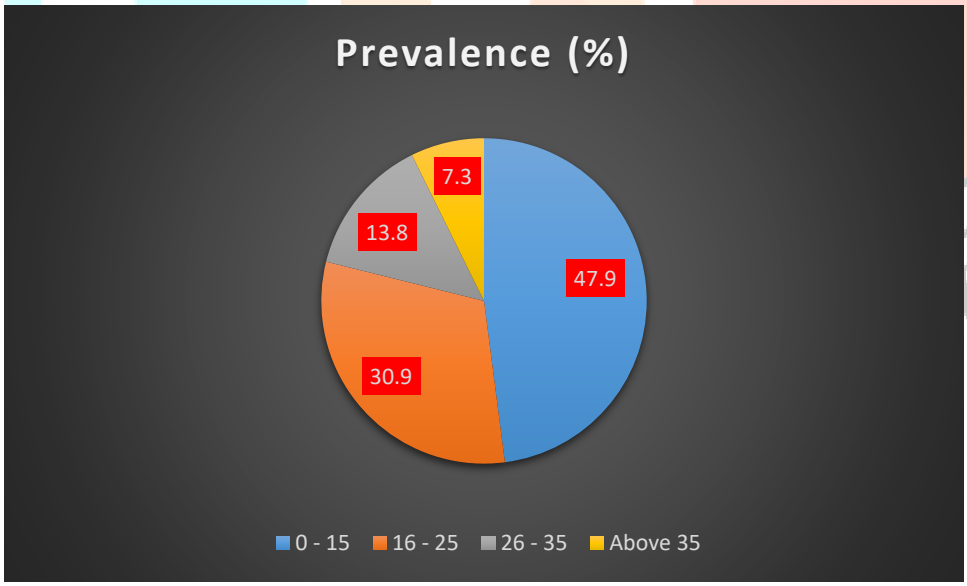


Fig:- 3- Prevalence of gastrointestinal parasitic infection according to gender.

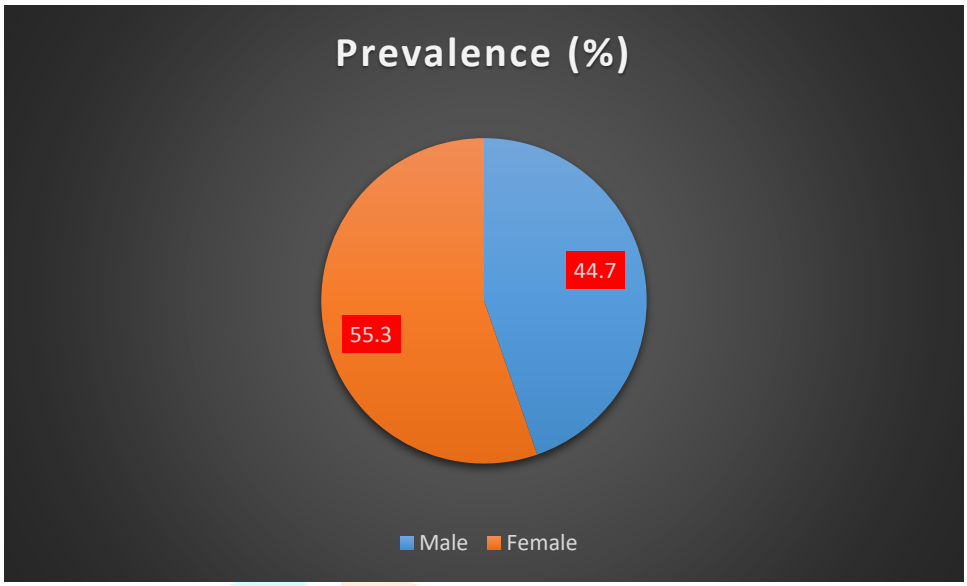


Fig:- 4 - Prevalence of gastrointestinal parasitic infection according to economic status.

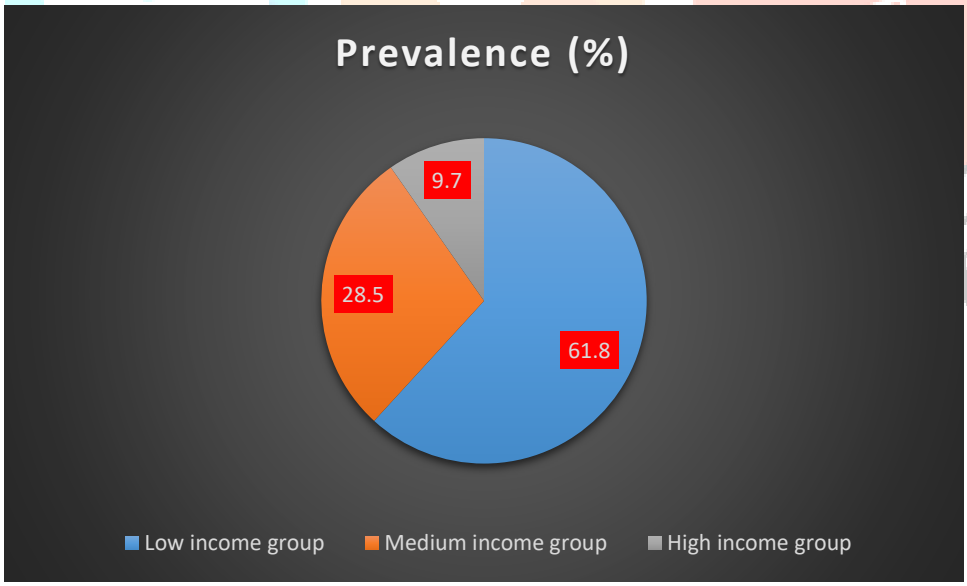
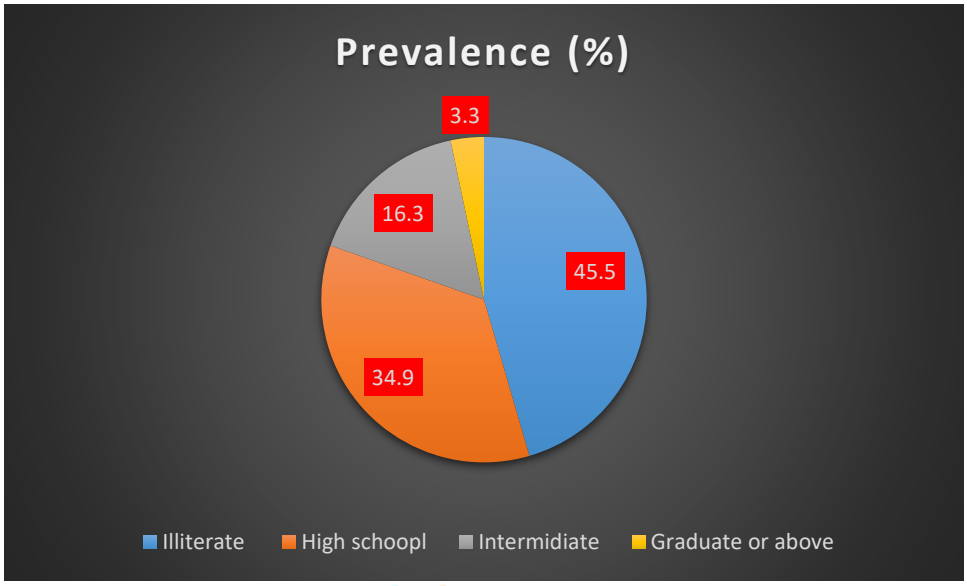


Fig:- 5 - Prevalence of gastrointestinal parasitic infection according to education status



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