International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2016): 79.57 | Impact Factor (2017): 7.296

Spectrum of Intestinal Parasitic Infection in HIV Infected Pregnant Women

Dr. Geetumoni Sonowal, Dr. Naba Kumar Hazarika

Abstract: ***Introduction: Parasites play an important role as opportunistic infections and are one of the most common causes of morbidity and mortality in HIV/AIDS patients. HIV infected pregnant women are more prone to develop parasitic infection because of their hormonal changes during pregnancy along with reduced immunity in HIV. Almost every parasite either directly or indirectly causes anemia and malnutrition, both are associated with an increased incidence of adverse pregnancy outcome. We therefore, planned to study the spectrum of intestinal parasitic infections in HIV positive pregnant women as the knowledge about the pattern of pathogen can often guide appropriate therapy. Methods and Materials: In this hospital based study of one year duration from July 2014 to June 2015, 51 Pregnant women attending Antenatal Clinic in Gauhati Medical College & Hospital, Guwahati and its Annexe Mahendra Mohan Choudhury Hospital testing HIV positive in the PPTCT, were taken up for the study. An equal number of 51 HIV negative pregnant women were taken up as controls. Stool samples were collected from both study and control group for microscopic and macroscopic examination. Results: The prevalence of intestinal parasites in study group is 19.6% and control group is 15.6% . Hookworm found to be the most common parasite in both groups (30% in study group and 37.5% in control group) followed by Ascaris lumbricoides (20% in study group and 25% in control group). Cryptosporidium parvum was found exclusively among the HIV positive group (20% in study group and 0.0% in control group). Conclusion: Prompt diagnosis of parasitic infection especially intestinal parasitic infection, among HIV infected persons is advocated in oder to improve the management and quality of life of HIV infected individual. Routine examination of stool samples for parasites could significantly benifit HIV infected and uninfected by contributing to reduce morbidity and adverse pregnancy outcome in antenatal women.***

1. Introduction

Human immunodeficiency virus (HIV) infections have continued to pose a serious challenge to the global health community over the past three decades.[1] In 1981 the first patient diagnosed with acquired immunodeficiency syndrome (AIDS) in the USA was reported. The growing number of people living with HIV has constantly been detected the world over and in particular from three continents, Asia, South America and Sub-Saharan Africa.[2]

The initial stage of HIV infection involves specific interaction of the virus with CD4 molecule on the T lymphocyte surface. When the CD4 cell counts falls below 200 cells/µl, there is irreversible breakdown of immune defence mechanism, and the patient becomes prey to a variety of human opportunistic pathogens like bacterial, viral, fungal, and parasitic.[1]

Of these, parasites play an important role as opportunistic infections and are one of the most common causes of morbidity and mortality in HIV/AIDS patients.

The high prevalence of certain opportunistic parasites among HIV positives is well known. Such co-infections present with more severe clinical symptoms compared to parasite infections of otherwise healthy people, and are more difficult to treat.[3]

Although pregnant women are not immunosuppressed in the classic sense, immunologic changes of pregnancy may induce a state of increased susceptibility to certain intracellular pathogens, including viruses, intracellular bacteria, and parasite.[4]

HIV infected women tend to experience faster CD4 decline during and after pregnancy and could therefore be even more susceptible to helminth infection and malaria. Intestinal parasitic infections, especially due to helminths, increase anemia in pregnant women. The results of this are low pregnancy weight gain and intra uterine growth retardation (IUGR), followed by low birth weight (LBW), with its associated greater risks of infection and higher perinatal mortality rates.

2. Materials And Methods

This is a hospital based study of one year duration from July 2014 to June 2015, 51 Pregnant women attending Antenatal Clinic in Gauhati Medical College & Hospital ,Guwahati,Assam and its annexe Mahendra Mohan Choudhury Hospital testing HIV positive in the PPTCT, were taken up for the study. An equal number of 51 HIV negative pregnant women were taken up as controls. Subjects were taken up maintaining strict confidentiality and obtaining informed consent and applying for permission from the appropriate programme authority.

Sample Collection: A sterile wide bore container and plastic spoon was given to the participants for collection of fresh stool samples. It was strictly instructed to avoid mixing the specimen with dirt, water or urine. The container with the specimen was labelled with the participants' name, serial number and the time of passing of stool. Whenever possible the specimen were brought to the laboratory and examined within half an hour after passage (as trophozoites begin to disintegrate or change within a short time and become unrecognizable). 10% formaldehyde was used as preservative in a few doubtful cases that would require examination at a subsequent date.

Each stool specimen was examined for parasites by the following techniques:

1) Macroscopic Examination: The consistency of the stool was checked and noted whether it was soft, liquid, semi-formed or formed. Stool was also examined for presence of mucous and blood. The colour, odour and pH were also

noted. Naked eye examination of stool for parasitic elements i.e. whole parasite (e.g. adult worms of A. lumbricoides, E. vermicularis) or part of it (segments of tapeworm) was carried out in all stool samples.

2) Microscopic Examination: DIRECT WET MOUNT: Wet mount preparations were made with normal saline and iodine to differentiate between the iodine staining and non iodine stainned ova and cysts. DIRECT SMEAR: Direct smear of stool samples were made to stain by the Kinyoun's method. The intestinal coccidian protozoa release oocysts in the stool which are acid fast. So when stool is stained by modified acid fast stain (kinyoun's stain) they are stained pink to deep red in a blue background

3. Results and Observations

In this present study 51 HIV positive pregnant women attending Antenatal clinic in GMCH and its annexe MMCH were taken up for the study. Equal number (51) HIV negative pregnant women were taken up as controls.

Table -1 shows the total number of positive stool samples for intestinal parasites (19.6% in study group and 15.6% in control group) .This finding was not found statistically significant (p-value 0.7957)

Table 1: Prevalence of intestinal parasitosis

	No. of positive stool sample
Study group (n-51)	10 (19.6%)
Control group (n-51)	8 (15.6%)
P - value	0.7957

Profile of Intestinal Parasites Isolated:
Table -2 shows the profile of parasites isolated from the study and control group. The parasites detected in our study included *Hookworm* (30% in study group and 37.5% in control group*), Ascaris lumbricoides* (20% in study group and 25% in control group*), Entamoeba histolytica* (10% in study group and 25% in control group), *Trichuris trichura* (10% in study group and 12.5% in the control group*), Cryptosporidium parvum* (20% in study group and 0.0% in control group), *Giardia lamblia* (10% in study group and 0.0% in control group) .The two *hookworms* were not differentiated Hookworm found to be the most common parasite in both groups . Cryptosporidium parvum was found exclusively among the HIV positive group.

Table 2: Profile of intestinal parasites among study group and control group

Parasites isolated	*Study group*	*Control group*	*P-value*
Ascaris lumbricoides	2 (20%)	2 (25%)	1.000
Hookworm	3 (30%)	3 (37.5%)	1.000
Trichuris Trichura	1 (10%)	1 (12.5%)	1.000
Entamoeba Histolytica	1 (10%)	2 (25%)	1.000
Giardia Lamblia	1 (10%)	0 (0.0%)	1.000
Cryptosporidim parvum	2 (20%)	0 (0.0%)	0.4950
Total	10 (100%)	8 (100%)	0.7957

4. Discussion

Parasitic infection remains an important cause of morbidity and mortality in developing countries especially among HIV infected individuals. HIV infection is a significant risk factor for acquiring an intestinal parasitic infection.

This study determined the prevalence and pattern of intestinal parasites among HIV positive and negative antenatal women to asses if the occurrence was evident.

The overall prevalence of intestinal parasitosis was found to be 19.6% (10/51) among the HIV positive study group compared to 15.6% (8/51) of HIV negative control group. But this difference in prevalence of intestinal parasite among HIV positive and negative individual is not found to be statistically significant. This observation may agree with several reports stating that intestinal parasitic infections in AIDS patients depend largely on the prevalence of intestinal parasitosis in the local community. Studies reported with no significant difference in the rate of infection between HIV positive and negative groups are Zali et al (2004)[5] Daryani et al(2009)[6] Moges et al (2006)[7]

Studies with a higher prevalence of parasitic infection than the present are as follows--. Assefa et al (2009 in Ethiopia)[8] Singh et al (2013,south India)[9] Zope et al (2014,India) [10], Chavan et al (2014,from India)[11] 58.5%, Malaji et al (2012,India)[12]with 44%, Mehta et al (2013,India)[13] with 28%

Few other studies found a lower rate of prevalence than the present study, viz. Faye et al (2010,Senegal)[14] with 10.6%, Nkenkou et al (2013, Cameroon)[15] with 14.64%, Akinbo et al (2010, Nigeria) [16]with 15.3% and 6.2% in HIV positive and negative patients respectively,Tian et al (2012,China)[17] with 4.3% and 5.6% among HIV positive and negative respectively, Meamer et(2007)[18] with 11.4% and 11.6% among HIV positive and negative patients respectively.

In this study Hookworm was found to be the most common intestinal parasite (30 % in study group and 37.5% in control group), followed by *Ascaris lumbricoides*(20% in study group and 25% in control group) and *Entamoeba histolytica* (10% in study group and 25% in control group). *Trichuris trichura(* 10% in study group and 12.5% in control group*) Cryptosporidium parvum (* 20% in study group and 0.0% in control group*), Giardia lamblia* (10% in study group and 0.0% in control group) . No statistically significant difference in prevalence of individual parasite species was detected between the study group and controls excepting that *Cryptosporidium parvum* which is known as opportunistic agent in AIDS patient was found exclusively among HIV positives with a higher prevalence rate (20%) as found by many other studies. This can be explain by understanding the nature of the immunological disturbances in AIDS patients in whom immune damage is mostly related to T cell subpopulations and lymphokines, in close relation to the cellular immunoresponse of T-helper (Th-1) CD4 lymphocyte against intracellular parasites.

The distribution of parasite may depend on geographical/ ecological variation and behavioural activities. Thus this

difference can be seen between country to country and even different regions of the same country.

5. Conclusion

The current study investigated the frequency and distribution of intestinal parasitic infection in HIV positive and HIV negative antenatal women in an effort to ascertain whether trends were evident and to provide information on potential contribution of opportunistic and non-opportunistic parasite to morbidity in HIV infected patients.

Parasitic infection remains an important cause of morbidity in developing countries especialy among the HIV infected persons. Prompt diagnosis of parasitic infection especially intestinal parasitic infection, among HIV infected persons is advocated in order to improve the management and quality of life of HIV infected individual. Routine examination of stool samples for parasites could significantly benifit HIV infected and uninfected by contributing to reduce morbidity and adverse pregnancy outcome in antenatal women. Further studies with higher number of study population will give more valuable information on the subject.

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