Scholars Journal of Applied Medical Sciences (SJAMS)
Abbreviated Key Title: Sch. J. App. Med. Sci.
ISSN 2320-6691 (Online)
ISSN 2347-954X (Print)

A Unit of Scholars Academic and Scientific Society, India
www.saspublisher.com

Microbiology

A Study of *Cryptosporidium parvum* Infection in HIV/AIDS Patients Presenting With Diarrhea at Different CD4 T-Cell Count

Deepa Upadhyay[1], Mahesh Kumar[2*]
[1]M.Sc (medicine) Microbiology, Senior Demonstrator, Department of Microbiology, R.N.T. Medical College, Udaipur, Rajasthan, India
[2]M.Sc (medicine) Microbiology, Senior Demonstrator, Department of Microbiology, R.N.T. Medical College, Udaipur, Rajasthan, India

Original Research Article

***Corresponding author**
Mahesh Kumar

Article History
Received: 15.05.2018
Accepted: 24.05.2018
Published: 30.05.2018

DOI:
10.21276/sjams.2018.6.5.58

Abstract: Gastrointestinal infections are very common in patients with HIV infection or AIDS. Diarrhea is a common clinical presentation of these infections. The etiologic spectrum of enteric pathogens causing diarrhea includes bacteria, parasites, fungi and viruses. The presence of opportunistic parasites Cryptosporidium parvum, Cyclospora cayetanensis, Isospora belli and Microsporidia are documented in patients with AIDS. Cryptosporidiosis in immunocompetent hosts is usually mild, self-limiting and recovers within a few weeks. In contrast, the infection may have a sever, chronic and even fatal clinical course in immunocompromised individuals. 1) Observation of Cryptosporidium parvum infection in HIV/AIDS patients presenting with Diarrhea. 2) Its correlation with CD4 T-Cell Count. This study was carried out in the Department of Microbiology, R.N.T. Medical College and Hospital, Udaipur, Rajasthan. Total 50 stool and blood samples from HIV positive patients were processed. Stool samples were processed for detection of Cryptosporidium parvum by modified acid fast stain technique and blood samples for CD4 T-Cell counts. Out of 50 stool samples of HIV positive patients 30 (60%) were positive for Cryptosporidium parvum. Blood samples from these patients tested for CD4 T-Cells, showing that Cryptosporidium parvum infection occurred in patients with CD4 T-Cells counts range 14- 484/µl and median CD4 T-Cell counts was 269/µl. Out of 30 positive samples 18 (60%) were males and 12(40%) were females. The present study highlights the importance of testing for intestinal parasites in patients who are HIV positive and emphasizes the necessity of increasing awareness among clinicians regarding the occurrence of theses parasites in this population.
Keywords: Cryptosporidiosis, HIV, AIDS, CD4 T-Cells.

INTRODUCTION

People with human immunodeficiency virus (HIV) are vulnerable to infection called "opportunistic infection, because they take opportunity by a weakened immune system. Since the beginning of HIV epidemics these infections have been recognized as common complications of HIV infection [1-3]. A decrease in CD4+ T Cells count is at least partially responsible for the profound immunodeficiency that leads to various opportunistic infections in HIV infected persons [4]. The relative frequencies of specific opportunistic diseases may vary in different countries and even in different areas within the same country [5]. T–Cells are involved in cell mediated immunity. Functionally they are divided by the expression of CD4 + and CD8+ markers. HIV damages immune system, it targets CD4 cells. The virus grabs onto the surface of a cell, gets inside and become a part of it. As infected CD4 cells multiply, it also makes more copies of HIV virus. Cryptosporidium has assumed great importance as a frequent cause of intractable diarrhea in HIV/AIDS patients and immunocompromised subjects. Cryptosporidium is a coccidian unicellular protozoan parasite. It completes its life cycle in a single host man [6].

MATERIALS AND METHODS

This study was carried out in the Department of Microbiology, R.N.T. Medical College and Hospital, Udaipur, Rajasthan. Total 50 stool and blood samples from HIV positive patients were processed. Stool samples were processed for detection of Cryptosporidium parvum by modified acid fast stain technique and blood samples for CD4 T-Cell counts.

Microscopy

Stool samples were requested from patients who presented with diarrhea. Samples were collected in a wide mouthed container. The presence of Cryptosporidium parvum oocysts was confirmed by examining the stool samples by modified Ziel – Neelsen's stain. The smears were flooded with carbol

fuchsin for 15 minutes. Decolorizing was done by 2% H_2SO_4 for 5 minutes. Counter stain was done with Loeffler`s methylene blue for 15-20 sec. By this staining oocysts appear as red acid fast spheres with 4-6 µm size, against a blue background.

CD4+ T Cell Count

Blood samples were received for CD4 T Cell Count. Count was done by Partec Flow Cytometric analysis.

RESULTS

Out of 50 stool samples of HIV positive patients 30 (60%) were positive for Cryptosporidium parvum. Out of 30 positive samples 18 (60%) were males and 12(40%) were females. Blood samples from these patients tested for CD4 T-Cells, showing that Cryptosporidium parvum infection occurred in patients with CD4 T-Cells counts range 14- 484/µl and median CD4 T-Cell counts was 269/µl. C. parvum was most commonly observed in patients with CD4 counts <300/µl.

DISCUSSION

Parasitic infection remains an important cause of morbidity and mortality in developing countries especially among HIV infected persons [7]. In present study, prevalence of infection with Cryptosporidium parvum was 60%, which is similar with the study carried out by S.M. Darji *et al.* (2009-2010) in which positivity was 74% at Ahemdabad, Gujrat[8]. The prevalence of Cryptosporidium parvum was 12% in study by SV Kulkarni, R.Kairon, SS Sane at NARI (ICMR) PUNE [9] and in another study by Basak, Boses, S Mallick SK Ghosh AK its prevalence was 28% [10]. This difference was due to different level of endemicity of parasites and sample size. Detection of C.parvum significantly below the CD4 T-Cell count of <300/µl indicates the typical opportunistic nature of these parasite.

CONCLUSION

Intestinal parasitic infection and diarrhea were common in HIV infected patients with low CD4 Counts. The present study highlights the importance of testing for intestinal parasites in patients who are HIV positive and emphasizes the necessity of increasing awareness among clinicians regarding the occurrence of theses parasites in this population.

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