Acute Dysentery Due to Free-Living Amoebae of the Genus Acanthamoeba

Sami Y. Guirges

ABSTRACT:

BACKGROUND:

It is well known that diarrhoea is caused by intestinal infection with parasites, bacteria, fungi or viruses.

OBJECTIVE:

This study was carried out to detect free living parasitic amoebae as a cause of diarrhoea .

MATERIALS AND METHODS:

Stool specimens from 120 patients suffering from severe diarrhoea with abdominal cramps were examined directly and cultured on special media for the isolation of free-living amoebae.

RESULTS:

In 120 patients with diarrhoea, 14(11.6%) showed presence of motile cells suspected to be free-living amoebae of the genus *Acanthamoeba*. These amoebae were isolated in culture in 4(28.6%) of the cases.

CONCLUSION:

Fourteen cases of non-fatal acute dysentery due to free-living amoebae without symptoms of meningoencephalitis is reported. Isolation of *Acanthamoeba* sp. from diarrhoeic stool was successful in (4) cases.

***KEY WORDS*:** acanthamoeba. acute dysentery.

INTRODUCTION:

Free-living amoebae as a cause of primary amoebic meningoencephalitis with fatalities and keratitis is well established. These amoebae as a cause of dysentery is not investigated previously except a case reported by Jadin *et al.* [(1)] and another case reported by us in Bombay [(2)]. In our routine stool examination from cases of diarrhoea we observed among the pus cells motile cells triangular in shape with hyaline cytoplasm from which fine filamentous pseudopodia are projected we suspected that these motile cells could be free-living amoebae. Depending on our previous and present observations that the free-living amoebae of the genus *Acanthamoeba* may cause acute dysentery, we tried to search for and isolate this microorganism from such cases of diarrhoea of unknown aetiology where no other aetiological agents could be detected whether parasitic, bacterial, fungal or viral.

MATERIALS AND METHODS:

The clinical material on which this study is based consisted of (120) patients suffering from severe diarrhoea with abdominal cramps attending the Out-Patient general laboratory of the Medical City Teaching Hospital in Baghdad. The patients attending this hospital comes from most areas of Baghdad province and other surrounding provinces. Also this laboratory receives stool samples from in-patients of this hospital. Seventy five patients (63%) were males and 45 (37%)) were females; their ages ranged from (15-70) years. Concerning collection of faeces as fresh specimens, it was made certain that the patient was not taking any preparation containing barium, bismuth or any medicine which may has some effect on the results of the examination. All the patients under study suffering from diarrhoea for one to two weeks associated with slight fever and the presence of mucus and blood in their stools. It is worthwhile to mention that in these patients no aetiological agents could be detected as a cause of diarrhoea whether parasitic, fungal, bacterial or viral, microscopic examination was made by two direct wet film preparations in warm saline. Serological diagnosis by indirect haemagglutination test of sera from the patients using *Entamoeba histolytica* axenic antigen showed negative results. For the trial of isolation

Department of Microbiology,College of Medicine,University of Baghdad.

of free-living amoebae, the stool specimens were cultured on non-nutrient agar with *Escherichia coli* according to the method of Singh [3]. This medium is prepared by washing the agar for two to three days in distilled water and changing the water a few times daily, sterilized and plating in petri-dishes.

RESULTS:

Of the (120) patients in the study, 72(60%) had episodes of diarrhoea ranging from four to six times a day, and the other 48(40%) patients had more than six up to ten episodes a day. This multiple episodes of diarrhoea accompanied by abdominal pain and the presence of mucus and blood in the fluid stools. Meticulous examination of the diarrhoeic stool from these patients in a warm wet film preparation, in 14(11.6%) showed motile cells approximately (25u) in diameter with filamentous pseudopodia uninucleated with a contractile vacuole suggesting a free-living amoebae. The successful isolation in culture of these amoebae confirmed our observation and was identified as *Acanthamoeba* sp. and this isolation was successful in [4] cases (28.6%) only. It is worthwhile to mention that culture of all stools on *E. histolytica* medium for the isolation of other parasitic amoebae yielded negative results.

DISCUSSION:

The present study suggests a pathological effect of *Acanthamoeba* on the human intestine as indicated by diarrhoea, abdominal pain and the presence of pus cells and red blood cells in the examination of diarrhoeic stool from the patients which is in correspondence with the observations reported by others [1,2]. For the best of our knowledge only each of these authors reported a case of dysentery caused by *Acanthamoeba* in patients with severe diarrhoea. *Acanthamoeba* sp. is widely distributed in nature causing primary amoebic meningoencephalitis, eye infection and keratitis [3,4,5,6]. In the present study, it is worthwhile to-mention that [12] out of the [14] patients in which the free-living amoebae recovered in their stools were farmers consuming either unchlorinated river or stagnant water in their field where samples of such water was found heavily infested with free-living amoebae (unpublished observations). The isolation of *Acanthamoeba* in culture was successful in only [4] cases, and failure of this isolation in the other cases may be explained by mild infections in which small numbers of amoebae were cultured or due to another species of *Acanthamoeba* cannot be cultivated easily or may be due to other unknown factors. The mechanism by which the free-living amoebae invade the intestinal mucosa is not yet properly understood, although some investigators suggested that these amoebae attack the cells directly [7,8], or the amoebae produce a filterable cytopathogenic enzyme which enable them to invade the cells of the mucous membrane of the large intestine [9]. On the other hand, metronidazole was found effective in dysentery due to *Acanthamoeba* [2] and this drug and other currently available antiamoebic therapy are used in most cases of diarrhoea without laboratory investigations, therefore such treatment may hide many cases of free-living amoebae dysentery and these amoebae should not be neglected in such cases.

CONCLUSION:

Fourteen cases of non-fatal acute dysentery due to free-living amoebae without symptoms of meningoencephalitis is reported. Isolation of *Acanthamoeba* sp. from diarrhoeic stool was successful in [4] cases.

REFERENCES:

1. Jadin, J.B., Willaert, E. and Hermanne, J. : The presence of limax amoebae in the intestine of man and animals. Bull. Senc. Acad. R.Sci. Outre, Mer., 1973;3: 520.
2. Mehta, A.P. and Guirges, S.Y. : Acute amoebic dysentery due to free-living amoebae treated with metronidazole. J. Trop. Med. Hyg., 1979;82:134-36.
3. Singh, B.N. : Pathogenic and non-pathogenic amoebae.; MacMillan, London and Basingstoke. 1975.
4. Radford, C.F., Minassian, D.C. and Dart, J.K.G. : *Acanthamoeba* Keratitis in England and Wales: incidence, outcome, and risk factors. Br. J. Ophthalamol., 2002;86:536-42.
5. Speer, C.E., Hofmeister, E.M. and Cohen, E.J. : An atypical presentation of *Acanthamoeba* keratitis in a non contact lens wearer. Eye and Contact Lens, 2003;29:21-22.
6. Guirges, S.Y., Mousa, A.A.A. and Al-Hadithi, F.: Ocular acanthamoebiasis in Iraq, case report. J. Fac. Med. Baghdad. 2008;50: 271-72.
7. Culbertson, C.G. : Pathogenic *Naegleria* and *Hartmannella (Acanthamoeba)*. Ann. N.Y. Acad. Sci., 1970;174:1018-22.

8. Martinez, J.A., Duma, R.J. and Nelson, C.E., and Moretta, F.L.: Experimental *Naegleria* meningoencephalitis in mice, penetration of the olfactory mucosal epithelium by *Naegleria* and pathologic changes produced by light and election microscope study. Lab. Investig., 1973;29:121-33.

9. Chang, S.L.: Small free-living amoebas: Cultivation, quantitation, identification, classification, pathogenesis and resistance. Current Topics in Comp. Path., , Academic Press Inc. New York and London. 1971;1:201-54.