Entamoeba histolytica in male homosexuals

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SUMMARY The mobility patterns of four enzymes using cultured trophozoites of *Entamoeba histolytica* were examined by electrophoresis. By this means the stocks of amoebae isolated from male homosexuals were characterised into zymodemes. No amoebic stock isolated corresponded to a pathogenic zymodeme.

Introduction

Characteristic isoenzyme patterns have been identified for all the intestinal amoebae of man.¹ Among these, stocks of *Entamoeba histolytica* are distributed into 18 pathogenic and non-pathogenic zymodemes.² All the amoebic stocks characterised were collected not only from hospital patients within the UK but also from such endemic areas in the world as India, Central America, and South Africa. The amoebae were isolated as trophozoites by inoculation of material into culture media containing bacteria.³ The series of isolations reported here were compared with those already characterised.

Materials and methods

Samples of faeces collected from male homosexual volunteers attending two London hospitals and one Edinburgh hospital were inoculated into culture as described.^{1,2} The trophozoites harvested from culture were lysed in water by freezing and thawing, and the released enzymes protected by the use of dithiothreitol, ϵ -amino-caproic acid, and ethylene diamine-tetracetic acid. Finally, the material was stored in liquid nitrogen. The lysates were applied to thin layer starch gel electrophoresis and subsequently the isoenzyme patterns located visually by the use of a formazan development. The zymodemes were identified using EC 5319 glucose-phosphate isomerase (GPI); EC 11140 L-malate : NADP⁺ oxidoreductase (oxaloacetate decarboxylating) (ME); EC 2751 phosphoglucumutase (PGM); and EC 2711 hexokinase (HK).⁴

The cellulose acetate membrane precipitin test for amoebiasis⁵ was used to test the serum of all the London subjects (the majority of cases) in the survey and all proved to be negative.

Results

The isoenzyme patterns for the 18 zymodemes of *E. histolytica* so far characterised are shown in the figure. Among these patterns those showing the presence of a β band and the absence of an α band in PGM are known to be expressed by pathogenic strains.² The remaining zymodemes were characteristic of non-pathogenic strains isolated from asymptomatic "cyst-passers." With only one exception, advanced bands in hexokinase confirmed the PGM interpretation.

Table I shows the distribution of faecal protozoa from 470 male homosexuals, and there were some mixtures of species of amoebae. Of the 52 samples containing *E. histolytica*, however, all were non-pathogenic, and their distribution into four zymodemes is shown in table II. Zymodemes I and III were the most commonly encountered, as occurs generally throughout all the areas of the world so far surveyed.

Discussion

Over the past few years the presence of *E. histolytica* in male homosexuals has been reported on several occasions. Because of their social habits this section of the population are likely to disseminate *E. histolytica* more readily than heterosexuals.

In 1967 Most⁶ addressing the American Society of Tropical Medicine and Hygiene suggested an association between amoebiasis and homosexuality. In the 1970s numerous workers⁷⁻¹⁴ suggested an

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FIGURE Zymodemes of *Entamoeba histolytica* identified using EC 5319 glucose phosphate isomerase (GPI); EC 11140 L-malate:NADP⁺ oxidoreductase (oxaloacetate decarboxylating) (ME); EC 2751 phosphoglucomutase (PGM); and EC 2711 hexokinase (HK).

TABLE I Distribution of faecal protozoa from 470 male homosexuals

Protozoa	No of subjects
<i>Entamoeba histolytica</i>	52
<i>Entamoeba coli</i>	84
<i>Entamoeba hartmanni</i>	43
<i>Endolimax nana</i>	78
<i>Iodamoeba buetschlii</i>	21
<i>Giardia lamblia</i>	17

TABLE II Distribution of *Entamoeba histolytica* zymodemes from 470 male homosexuals

Zymodeme:	I	III	V	XVII
Total No	28	22	1	1

association between homosexuality and gastrointestinal infections. Their research was carried out in highly selected populations. William *et al*⁷ studied 89 self selected homosexual men attending a specific health project in New York; 26% had infection with *E histolytica*, *Giardia lamblia*, or both. Kean⁸ found in his survey that 40% of 126 patients had *E histolytica* or *G lamblia* or both in their faeces.

Keystone *et al*⁹ in their study in 1980 in Toronto found 36.5% of 200 homosexuals were similarly infected with either or both parasites. In contrast, they found only a 4% infection rate with these parasites in 100 heterosexuals used as controls.

To show that the vast majority of homosexuals are passing only non-pathogenic *E histolytica*, we have examined faecal samples from 470 such people. When cultured 52 of these samples grew *E histolytica* (11.1% infection rate), while there were also pure growths and mixtures of the other intestinal amoebae. Helminths were never identified by concentration methods of all samples.

Only some of the subjects were specifically treated for amoebiasis, and the decision for this was on clinical grounds alone. Thus some men passing *E histolytica* cysts in their faeces were not treated, and these have subsequently not presented with amoebic symptoms. An 11% infection rate for *E histolytica* is high when compared with the approximate rate of 0.5% in the general population in the two cities used for this survey. Furthermore, the rate of 11% is also about 10 times that of pathogenic *E histolytica* found in a survey² of a known endemic area of Africa for this amoebae.

E histolytica is circulating at a high level in a community which in these days of increased continental travel is divided between such cities as London and New York. The danger of introducing a pathogenic zymodeme into this pool where dissemination could theoretically be very rapid is quite alarming. Since faeco-oral contamination probably plays a notable role in the homosexual community there is a need to consider very carefully the treatment for any male homosexual passing *E histolytica* cysts.

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