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INDEX:

SURVEILLANCE OF INTESTINAL AMOEBIASIS AND ITS TREATMENT OVER A PERIOD OF THREE YEARS WITH METRONIDAZOLE IN AN INSTITUTION

by

T. N. Mathur[1] and Jogesh Kaur[2]

1. INTRODUCTION

To the best of our knowledge, there has been no previous study on the surveillance of intestinal amoebiasis in a closed community in India. A survey of the prevalence of intestinal amoebiasis in a population of 255 Bengali women and children living in a Mahila Ashram (Widows' Home) in Haryana, India, was undertaken and follow-up was continued for three years. The present paper reports the results of this study.

2. MATERIAL AND METHODS

The study was conducted according to the criteria laid down by a WHO Expert Committee on Amoebiasis (WHO, 1969). In April 1970, three consecutive stool specimens of all the inmates were examined according to methods described by Kaur & Mathur (1972). Those persons who were found infected with Entamoeba histolytica were first treated for any helminthic infection present. They were then given 400 mg of metronidazole three times a day for five days (total dose 6.0 g) as treatment against intestinal amoebiasis. Children were given proportionately smaller doses.

The population was again surveyed a second time in December 1971, a third time in September 1972, and a fourth time in January 1973. Follow-up was completed in April 1973. In all these resurveys, the stools of every treated case were examined six times after the first, second and third month of each treatment and the stools of the rest of the inmates three times. In a previous study Mathur & Kaur (1973) found that three consecutive stool examinations would reveal a prevalence of 58% amboebic infection and six consecutive examinations, a prevalence of 84%. The results reported below were based on parasitological findings, although improvement was also assessed clinically. A control group of 16 patients was left untreated, but given placebos and similarly followed up. Metronidazole was also tried as a prophylactic in eight cases.

3. RESULTS

Table 1 shows the prevalence of the various protozoal and helminthic infections among the inmates, based on the results of examination of three stool samples.

3.1 Initial survey

In the first survey, out of 47 (18%) inmates found positive (Table 1), 46 had non-dysenteric amoebic colitis. Out of these, 29 were symptomatic and were treated. As shown in Table 2, 21 (72%) were cured but two of these patients became reinfected after three months. Eight

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[1] Present address: Chief Medical Officer, Radha Soami Satsang Beas, Punjab, India.

[2] Medical Officer, Haryana Government Public Health Laboratory, Karnal, Haryana, India.

patients who showed treatment failure after three months were given a second course of metronidazole and then received the drug as a prophylactic in a dose of 400 mg administered twice a day, once a week for three months. Of these eight patients, six were cured and as a result the cure rate was improved from 72% after the first drug course to 93%.

A control group of 16 patients with non-dysenteric amoebic colitis was left untreated. Of these, three (19%) were cured without any medication, and three became such infrequent cyst passers that they were difficult to detect even after three consecutive stool examinations carried out many times over a long period.

3.2 Second survey

After 21 months the 250 inmates still remaining in the Home were re-examined. As shown in Table 1, 35 (14%) were positive for cysts of E. histolytica and included 25 new cases, one treatment failure, one reinfection after treatment and eight old untreated cases of the control group. Out of the 29 treated, 23 (79.4%) were cured (Table 2).

3.3 Third survey

The stools of 240 inmates were tested. As shown in Table 1, 28 (11.7%) were positive for cysts of E. histolytica and included 18 (7.5%) new cases, six reinfections after treatment and four treatment failures. Out of the 27 who were treated, 20 (74%) were cured (Table 2).

3.4 Fourth survey

The stools of 227 inmates were tested and, of the eight (3.5%) found positive (Table 1), one was a case of reinfection after treatment and seven (3.1%) were new cases.

4. DISCUSSION

Reference to Table 1 shows that not only did the overall prevalence of E. histolytica drop from 47 (18.4%) to eight (3.5%) in the whole community, but the occurrence of new cases also fell from 25 (10%) to seven (3.1%). This reduction in the percentages is statistically significant (P 0.01).

A statistically significant (P 0.01) reduction in the prevalence of E. coli, Iodamoeba buetschlii and Endolimax nana was also observed and is shown in Table 1. As for Giardia lamblia, reduction in the prevalence of this infection was very small, i.e. from 24.7% to 19.8%, because of the 207 cases only the 15 persons who had a simultaneous E. histolytica infection were treated. Of these 15 treated patients infected with G. lamblia, six (40%) relapsed within three months.

In the closed community studied, 117 out of 118 cases of intestinal amoebiasis found during the four surveys suffered from non-dysenteric colitis, the type of amoebiasis which prevails in Haryana. Reference to Table 2 shows that the cure rate after each course of metronidazole fell gradually from 75% after the first course to 70% after the second and to 60% after the third. Two patients continued to pass cysts of E. histolytica even after three courses of treatment.

From the above results, it is evident that there are some very resistant cases which may become so difficult to treat that it may be hard to eliminate entirely the source of infection from a community. Moreover, there were 10 cases of reinfection during the course of three years, and it was found that the chance of reinfection among the treated cases was of the same order as the chance of acquiring fresh infection among the rest of the inmates. On another hand, the number of infected families fell from 56.4% to 10%; this is a statistically significant (P 0.01) decrease which suggests that as the cure rate increases, the likelihood of acquiring infection from infected persons decreases even in a closed community where such a risk is great.[1]

[1] Relaxation of surveillance in the community after April 1973 resulted in a rise in the prevalence rate of E. histolytica infection from 3.5% to 7.4% 15-17 months later when a resurvey was made between July and September 1974.

5. SUMMARY

Surveillance of intestinal amoebiasis and the effects of treatment with metronidazole in a closed community of 255 Bengali women and children was undertaken over a period of three years in Haryana, India. During this period four surveys were made in which stool specimens from the entire population were examined. Persons found positive for Entamoeba histolytica were first treated for any helminthic infection present and then received 400 mg of metronidazole three times a day for five consecutive days as treatment against intestinal amoebiasis. (Children received proportionately smaller doses.) Out of the 118 cases of intestinal amoebiasis found during the four surveys, 117 had non-dysenteric amoebic colitis for which the above treatment was given. Results showed a statistically significant reduction in the incidence of E. histolytica infection from 18.4% to 3.5%, whereas the cure rate after each treatment only fell from 75% to 60%. Some resistant cases proved difficult to cure even after three courses of metronidazole and it may therefore be hard to eliminate entirely the source of infection from a community. The chance of reinfection among the treated cases was found to be of the same order as the chance of acquiring fresh infection among the rest of the community. There was, however, a significant reduction in the number of infected families from 56.4% to 10% and this suggests that with the decrease in the incidence of E. histolytica, the likelihood of acquiring infection from infected persons also decreases, even in a closed community where such a risk is great.

A significant simultaneous reduction of other protozoal infections among the population was also observed, in particular for E. coli, Iodamoeba buetschlii and Endolimax nana, but not for Giardia lamblia.

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RESUME

A Haryana (Inde), les auteurs ont fait pendant trois ans une étude de surveillance de l'amibiase intestinale et des effets du traitement par le métronidazole dans une collectivité fermée de 255 femmes et enfants Bengali. Pendant cette période, ils ont examiné à quatre reprises des spécimens de selles provenant de la totalité de la population en analysant chaque fois trois échantillons pour chaque personne. Après chacune des quatre investigations, les sujets trouvés porteurs d'Entamoeba histolytica ont d'abord reçu, le cas échéant, un traitement anthelmintique, puis 400 mg de métronidazole, trois fois par jour, pendant cinq jours consécutifs, contre l'amibiase intestinale (les doses étant proportionnellement réduites pour les enfants). Dans les cas d'échec thérapeutique ou de réinfection, le traitement a été répété. Six échantillons de selles provenant de chaque cas traité ont été examinés chaque mois pendant les trois mois suivant le traitement. Sur les 118 cas d'amibiase intestinale décelés lors des quatre investigations, 117 présentaient une colite amibienne non dysentérique qui a été traitée comme indiqué ci-dessus. Les auteurs ont constaté une réduction statistiquement significative de l'incidence de l'infection à E. histolytica, qui a été progressivement ramenée de 18,4 % (investigation initiale) à 14 % (deuxième investigation) puis à 11,7 % (troisième investigation) et enfin à 3,5 % (quatrième investigation). Entre le premier et le troisième traitement, le taux de guérison, par contre, a seulement régressé de 75 % à 70 % et à 60 %. Certains cas résistants ont cédé difficilement,

même après trois traitements par le métronidazole; il semble donc qu'on puisse avoir du mal à éliminer entièrement la source d'infection dans une collectivité. Il y a eu en outre dix cas de réinfection au cours des trois années et il est apparu que la probabilité de réinfection des cas traités était du même ordre que la probabilité d'infection nouvelle dans le reste de la collectivité. En revanche, la proportion de familles infectées est tombée de 56,4 % à 10 %, ce qui donne à penser qu'une diminution de l'incidence d' E. histolytica s'accompagne vraisemblablement d'une diminution de la contamination par contact avec des personnes infectées, même dans une collectivité fermée où le risque est considérable.

Il a été observé simultanément, dans la population, une réduction importante d'autres infections à protozoaires, en particulier E. coli, Iodamoeba buetschlii, et Endolimax nana; mais pour Giardia lamblia l'incidence est restée presque inchangée.

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TABLE 1. PREVALENCE OF PROTOZOAL AND HELMINTHIC INFECTIONS AMONG THE INMATES OF AN INSTITUTION, BASED ON THE RESULTS OF EXAMINATION OF THREE STOOL SAMPLES[a]

Survey (and date)	Total No. of inmates examined	Total Eh cases	New Eh cases	Ec	En	Ib	Gl	Cm	Hw	Hn	Ov	Tt	Al
Initial (April 1970)	255	47 18.4%	47 18.4%	151 59.2%	229 90.0%	156 61.2%	63 24.7%	2 0.8%	209 82.0%	88 34.5%	36 14.1%	78 30.6%	3 1.2%
Second (December 1971)	250	35 14.0%	25 10.0%	121 48.4%	201 80.4%	119 47.6%	53 21.2%	3 1.2%	97 38.8%	65 26.0%	29 11.6%	23 9.2%	5 2.0%
Third (September 1972)	240	28 11.7%	18 7.5%	74 30.8%	127 52.9%	75 31.3%	46 19.2%	3 1.3%	35 14.6%	37 15.4%	6 2.5%	8 3.3%	Nil -
Fourth (January 1973)	227	8 3.5%	7 3.1%	52 22.9%	96 42.3%	51 22.5%	45 19.8%	2 0.9%	31 13.7%	26 11.5%	6 2.6%	1 0.4%	- -
Cumulative incidence	972	118 12.7%	97 10.0%	398 40.9%	653 67.2%	401 41.3%	207 21.3%	10 1.0%	372 38.3%	216 22.2%	77 7.9%	110 11.3%	8 0.8%

[a] Key to abbreviations used in table:

Eh = Entamoeba histolytica; Ec = E. coli; En = Endolimax nana; Ib = Iodamoeba buetschlii; Gl = Giardia lamblia; Cm = Chilomastix mesnili; Hw = Hookworm; Hn = Hymenolepis nana; Ov = Oxyuris vermicularis; Tt = Trichuris trichiura; Al = Ascaris lumbricoides.

TABLE 2. THE RESULT OF TREATMENT WITH THREE COURSES OF METRONIDAZOLE IN PATIENTS WITH NON-DYSENTERIC AMOEBIC COLITIS

Survey (and date)	First course			Second course			Third course		
	Number treated	Number cured	Percentage cured	Number treated	Number cured	Percentage cured	Number treated	Number cured	Percentage cured
Initial (April 1970)	29	21	72.4	8	6	75	-	-	-
Second (December 1971)	29	23	79.4	5	2	40	-	-	-
Third (September 1972)	27	20	74.1	7	6	85.7	5	3	60
Fourth (January 1973)	7	5	71.4	-	-	-	-	-	-
Total	92	69	75.0	20	14	70	5	3	60