GIARDIASIS IN NEPAL: ITS TREATMENT WITH FURAZOLIDINE

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Introduction

Diarrhoea is a cardinal feature of most of the enteric infections to which the intestinal flagellate, *Giardia lamblia* also belongs. Its role as one of the causes of chronic infective diarrhoea in all groups, particularly children, is being realised more and more in the tropical countries. But proper attention has never been focused on its problems, probably because the life history of the organism has not been studied so far with certainty, and also due to the fact that morbidity and mortality attributable to other enteric infections e.g. *Salmonella*, *Shigella*, Enteropathogenic *E. coli* and *Vibrio cholera*, outweighs the gravity of the disease caused by *Giardia*.

Several drugs have been claimed to be effective in giardiasis. But recently Furazolidine which is a synthetic nitrofurant derivative with its broad antibacterial activity against a wide variety of micro-organisms including *Vibrio cholera* in vitro and vivo, has attracted the attention of many people about its utility in the diarrhoeal diseases (Chaudhari 1965; Croft 1964; Rao et al 1965). The drug is rapidly metabolized in the gut and also well tolerated except for occasional side-effects eg. nausea, anorexia and vomiting. With these things in view, a therapeutic trial of the drug in giardiasis was conducted at the Infectious Diseases Unit (IDU), Bir hospital, Kathmandu, between July 1964 and Sept. 1966.

Materials & Methods

The drug was given to the patients in a cyclic fashion from 5 to 15 mg/kg body wt. in divided doses. It was administered for 5 or 7 days. Cases that were not controlled by this time were treated upto 12 days. Due to the ineffectiveness of the 5 mg dose series these schedules were withdrawn after a short trial, leaving 8 & 10 mg series alone.

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Dosage schedule table

	No of Cases	5 days	12 days	More than 12 days
5mg/kg	4	-	2	2
8mg/kg	16	4 (AGE)	10	2
10mg/kg	16	3 (AGE)	12	1 (19 days)
12mg/kg	3	2 (AGE)	1	-
15mg/kg	2	2 (AGE)	-	-

(AGE)=Acute gastro enteritis

The cases were followed up for evidence of complete cure which was arbitrarily taken to be the disappearance of the parasite in the stool samples examined on 3 consecutive days after completion of treatment, two at least of the examinations being by Znso₄ floatation technique with sp.gr:1.180 and or 1.060 and the other being Ridleys malachite green and normal saline smears with or without iodine. Schaudin's and Goldman's fixative were used when needed. Furazolidine was the only drug used except in three cases where simultaneous anti-tubercular therapy was employed. Concomitant helminthic infestations like ascariasis and ankylostomiasis were treated prior to the institution of the therapy.

Routine blood and urine examinations before and after therapy did not reveal any significant changes. Clinical aspects were also studied simultaneously.

CLINICAL ASPECTS No. of Cases in bracket

1. Age:

Years 1-5 (2) 5-10 (3) 10-20 (6) 20-30 (15) 30-40 (7) above 40 (9)

2. Season Baisakh (4) Jeth (2) Asar (1) Sawun (5) Bhadau (10) Asoj (4)
Kurtik (2) Mansir (3) Poosh (1) Magh (2) Falgun (5) Chait (3)

3. Stool

i) Onset of diarrhoea

Acute

(in hrs.)

(12)

Subacute

(in days up-to 4 wks.)

(7)

1-5 days

2

5-10 days

2

10-29 days

3

Chronic

(in mths.)

(23)

Months

1-2

2-3

3-4

4-5

5-6

More than 6

3

1

6

0

2

11

Symptomless

(-)

(None)

ii) Frequency of Stools

Frequency/day Pre-therapy: 1-2 (6) 3-6 (22) 7-12 (7) 12-23 (3) over 20 (4)

iii) Consistency Pre-therapy: Loose Watery: (12) Unformed (21) Semi-solid (9) Well-formed (-)

iv) Colour :

Yellowish (18) dark (-) greenish (1) blackish (2) rice waterlike (7) variable (14)

It was very foul smelling in 4 cases.

v) Mucus Slight (15) Moderate (8)

vi) Reaction of stool : Acid (35) Alkaline (8)

vii) Blood

9 cases showing blood in the stool comprised of 1 case of bleeding piles, 5 of associated bacillary dysentery, 1 of T.B. and 2 of amoebic dysentery.

4. Abdominal Pain

	Umbilical region	Epigastrium	Lt. flank	Rt. flank	Diffuse
Continuous	14	3	-	-	2
Intermittent	6	-	-	-	-
Total	20	3	-	-	2

5. Miscellaneous Eructation (7) Flatulence (32) Increased borborygmi (4)

6. Other associated parasite infections found from stool examination

Ascariasis	Hookworm	Whipworm	Ent. histolytica	a+h	a+h+w	a+w+e
(a)	(h)	(w)	(e)			
4	5	3	5	5	1	1

RESULTS :

1) Initial improvement

i) Frequency of stool after therapy

	1-2	3-6	7-12
Within 48 hrs.	34	2	-
Within 96 hrs.	2	3	1

ii) Consistency after therapy. Semisolid

After 48 hrs.	41
After 72 hrs.	1

2) Rapidity in the disappearance of Giardia lamblia from the stool

Dose per kg	No. of Cases	24 hrs.	24-48 hrs.	48-72 hrs.	72-96 hrs.	More than 96 hrs.	Not disappeared
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body wt.

5mg	4	-	-	-	-	-	4
8mg	16	1	7	2	3	3	-
10 mg	17	1	2	4	8	2	-
12 mg	3	-	2	1	-	-	-
15 mg	2	-	-	-	-	-	-

3) Evidence of Complete Cure seen :

Dose per kg body wt.	No. of cases	5 days	7 days	12 days	More than 12 days
5mg	-	-	-	-	-
8mg	11	2	7	2	-
10mg	14	3	0	1	1
12mg	3	2	1	-	-
15mg	2	2	-	-	-

Total: 30

This figure includes only those cases which were well followed up.

4) Side effects (Seen in 16 cases only)

	1-2 days	2-4 days	4-7 days	all days
a/ Burning sensation in abd	4	-	-	1
b/ Nausea	8	1	-	-
c/ Vomiting	2	-	-	-
d/ Anorexia	8	-	-	-
e/ Giddiness	1	-	-	-
f/ Headache (diffuse)	11	-	-	-
g/ Mental changes (incoherent talk)	-	-	-	-
h/ Cutaneous sensitisation	-	-	-	-
i/ Blurring of vision	-	-	-	1

DISCUSSION

The present study reveals that giardiasis can occur with different features in any age group in any season though mainly seen in the rainy season. Depending simply upon the duration of diarrhoea, the cases have been divided arbitrarily into acute (29.7%) subacute (16.70%) and chronic (54.70%) types.

The main feature of the disease was found to be altered bowel habits (76.2%). Its duration was more than 6 months in 26.19% of cases, between 1-6 months in 28.5% 1-29 days in 16.7% and of few hours in 28.6%. 21.4% of cases had semisolid stool and 78.6% had loose motions which were watery in 28.5% (presented with the features of acute gastroenteritis) and unformed in 50%. None had well formed stools. The frequency of motions was found to be more than 7 day in all acute cases and in a few chronic cases. But majority of cases had 3-6 motions a day though less than this number was also possible. Necessity to pass unformed stool at night off and on has been found to be an important feature of the disease, as such a trouble was noted in 26.2% of cases (Croft, et al 1964). The other important feature was pain in the abdomen which was present in 66.6% (Chaudhari 1965). The site of pain was restricted mainly to the umbilical region though it might be diffuse or localised in the epigastrium, left flank or right flank. The pain was of a dull-aching type being continuous in 45% and intermittent in 21.6%. None had colicky pain.

Flatulence with or without eructations was found to occur in 92.9% (Bombay Hospital J. 1966). Both the occurrence of very foul smelling stool and the increased borborygmi were complained by 9.9% of the patients. The colour of the stool is variable, the yellowish colour being predominant. The rice water-like stool being encountered some times in acute cases may simulate cholera save its typical smell. The stools in such cases should be urgently studied in an ordinary smear with carbol fuchsin and later be excluded by culture as in our series. Blood in the stool is not a feature of the disease unless associated with other conditions. The reaction of the stool is probably dependent upon diet than the disease itself.

As already mentioned, furazolidine was given to 42 patients in a cyclic fashion from 5 to 15 mgm/kg body wt. in order to see the effectiveness of the drug. 34 cases (80.9%) were well followed up, of which 30 (71.4%) including 5 (11.9%) of 12 mgm and 15 mgm series showed the evidence of complete cure while all the four cases (9.5%) of 5 mgm dosage being ineffective were discontinued subsequently. Since the patients receiving 12 mgm/kg body wt. persistently exhibited increased intolerance to the drug, they were withdrawn after a short trial even though these schedules were quite effective in controlling the disease. Apart from these, 8 cases i.e. 19% (2 from the series of 8 mgm for 5 days, 3 of 8 mgm for 7 days and 3 of 10 mgm for 7 days) could not be well followed up according to the regime of the trial though their stools had become negative by the time they left the hospital. As the stool examinations were also done to see the rapidity of the disappearance of *Giardia lamblia*, three consecutive stool examinations at the termination of therapy, two of which at least being by Znso₄ floatation technique were considered to be sufficient to recognise the relapse. Moreover, no evidence of relapse was found in a few cases where stool examinations could be done after some months. During the period of the trial, the stool was to be free from the flagellate by 96 hrs. in 30.9% of 8 mgm group and 35.7% of 10 mgm group, two each (4.8%) of both groups took more than 120 hours of which one chronic case of 10 mgm series had to be treated for 19 days and one of 8 mgm group took more than 96 hours but less than 120 hours. All cases with features of acute gastro-enteritis had negative stool by 48 hours. The overall cure rate in this series was 71.9%. But evidence of complete cure was seen in 81.8% by 7 days 8 mgm series as against 85.7% in 10 mgm series. When the duration of the treatment was prolonged to 12 days, the cure rate rose to 100% in 8 mgm series as compared to 92.8% in 10 mgm schedule. In other words, both of these schedules were more or less equally effective except for a few side effects occasionally, like headache, nausea, anorexia, burning sensation in abdomen and vomiting etc. the drug induced marked subjective improvements. The frequency of the motion was reduced to 1-2 in 80.9% within 48 hours, of which 42.8% had only one motion per day. By 96 hours of therapy, there were 3-6 motions a day in 11.9% and more than 6 per day in 2.3%. All except one who took 72 hours started having semisolid motions in 48 hours time. Similarly, remarkable improvement in flatulence and mucus in the stool occurred except in 4.70% in whom it persisted even after 96 hours. Pain abdomen also disappeared in 38.9% and improved in 28.5% through dull aching pain persisted off and on even after 96 hours.

Spicy food was not used in any of the patients under trial

The view that giardiasis can co-exist with other parasitic infections either singly or in mixed forms, has further been consolidated by its association being found with ascariasis, ankylostomiasis, trichuriasis and amoebiasis in this series. This is probably the reason why in several of the so called relapses of amoebic colitis, cysts of giardia were found in stool (Manson Bahr 1958).

Summary and Conclusion

Giardiasis is prevalent in Kathmandu Valley. It can occur with altered bowel habits as chronic diarrhoea with dull aching abdominal pain chiefly over the umbilicus, or as acute gastro-enteritis without any selectivity of age or season. It can coexist with other parasites with the avoidance of the concomitant use of alcohol in any form and probably of spicy food also, treatment by Furazolidine with 8-10mg/kg body wt. for 7-12 days appears to be quite satisfactory for giardiasis, except in patients who are unduly sensitive to the drug itself. The side effects like nausea, anorexia and headache are minimal with the above precautions.

Acknowledgement

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Reference :

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HE-CYCLIN CAPSULES

Each Capsule contains 250 mgms of Tetracycline Hydrochloride U.S.P.

Antibiological Action:

It is a broad spectrum antibiotic having a very wide range of effectiveness. It is also effective against spirochaetes, actinomycetes, rickettsias and some large virus. Entamoeba histolytica and Trichomonas vaginalis are also susceptible to it. At higher concentrations it can inhibit Proteus, Pseudomonas, Salmonella and Shigella species.

Pharmacology:

When orally given, it is being readily absorbed by G.I. tract. Therapeutic blood concentration is attained more readily than other members of the tetracycline family. Chlorotetracycline, oxytetracycline and tetracycline. It rapidly diffuses into body fluids, plasma and peritoneum, and crosses placenta barrier and blood brain barrier so that its concentration can be traced in cerebrospinal fluid and in foetal circulation. It is found concentrated in liver, kidney, lungs, spleen and other reticulo-endothelial tissues.

Dose:

Usual dose is 250 mg - 500 mg every 6 hours. 2.5-7.5 mg. per kg. body weight every 6 hrs. can be administered to the children. Vitamin of B and C group deficiency arising due to alteration in bacterial flora of the gut after prolonged administration is easily prevented by supplementing these Vitamins. Packing: Capsules of 250 mgm. each 6 Capsules in metallic container.

Capsule of 250 mgm. 10 Capsules in Strip packing

SAJHA S/ASTHA CE-1A

(Sole Distributors for Mys. Drug Research Lab. Kottamangal)

IODORT

(For External Use only)

Formula:-

Iodine	5%
Methyl Salicylate	5%
Vegetable oil and	
Paraffin base	Q.S.

Indication:-Rheumatism and Muscular Pains, Back pain:
for Massage of healed fractures etc.
Packing, Bottles of 25 gram.

CUF - NAS.

Cough Syrup.

In each 100 ml

Ext. Tolu I.P.	50ml
Ext. Vasaka I.P.	5ml
Codeine Phosphate B.P.	15 g.
Sodium Benzoate	1.5 g.
Menthol	.002"
Sucrose Suff to	66"

It soothes and stops dry cough in acute, and chronic bronchitis, influenza, sore throat etc.

Dose:

One teaspoonful thrice daily for adults. Half teaspoonful thrice daily for children or as directed by the physician.

Packing: Bottle 120 ml.

SAJHA SWASTHA SEWA

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