

**A. INGREDIENT NAME:**

**DILOXANIDE FUROATE**

**B. Chemical Name:**

Entamide 2-Furoate, Furamide, Furamide (Amebicide), 2-Furancarboxylic Acid, 4-((Dichloroacetyl) Methylamino) Phenyl Ester, 4-(N-Methyl-2,2-Dichloroacetamido)phenyl 2-furoate

**C. Common Name:**

Dichlofurazol, Diclofurazol, Histomibal, Miforon, Furentomin, Furamide, Furamid, Entamizole

**D. Chemical grade or description of the strength, quality, and purity of the ingredient:**

Assay            99.96%

**E. Information about how the ingredient is supplied:**

White Crystalline Powder, Odorless, Tasteless

**F. Information about recognition of the substance in foreign pharmacopeias:**

BP 1993

**G. Bibliography of available safety and efficacy data including peer reviewed medical literature:**

Botero, D. Amoebiasis. *Trans. R. Soc. Trop. Med. Hyg.*, 1967;61: 769.

Shapiro, M. M. The recurrence-rate of *Giardia intestinalis*. *Am. J. trop. Med. Hyg.*, 1967;16: 704.

Nnochiri, E. *J. trop. Med. Hyg.*, 1967;70:224.

1998-345431-02-22-BDLO9

Wolfe, M. S. Patients with non-dysenterica symptomatic intestinal amoebiasis. *J. Am. med. Assoc.*, 1973;224:1601.

Knight, R. The treatment of non-dysenterica intestinal amoebiasis. *Gut*, 1973;14:145.

Powell, S. J. Patients treated and was considered to have cured liver abscesses. *Ann. Trop. Med. Parasit.*, 1973;67:367.

Salaki, J. S. The successful treatment of a patient with *Entamoeba polecki*. *Trop. Dis. Bull.* 1990;77:51.

Bhopale, K. K., Pradhan, K. S., and Masani, K. B. Additive effect of diloxanide furoate and metronidazole (Entamizole) in experimental mouse caecal amoebiasis. *Indian Journal of Experimental Biology*. 1995;33(1):73-74.

Pehrson, P. and Bengtsson, E. Treatment of non-invasive amoebiasis. A comparison between tinidazole alone and in combination with diloxanide furoate. *Transactions of the Royal Society of Tropical Medicine & Hygeine*, 1983; 77(6):845-846.

Salaki, J. S., Shirey, J. L., and Strickland, G. T. Successful treatment of symptomatic *Entamoeba polecki* infection. *American Journal of Tropical Medicine & Hygeine*, 1979;28(2):190-193.

Wolfe, M. S. Nondysenteric intestinal amebiasis. Treatment with diloxanide furoate. *JAMA*, 1973; 224(13):1601-1604.

Huggins, D. Treatment of amebiasis. *Hospital*, 1965; 67(5):1107-1110.

#### **H. Information about dosage forms used:**

Tablet

#### **I. Information about strength:**

500mg 3 times daily for 5 days or 20mg/kg/daily divided into 3 daily doses for 10 days.

#### **J. Information about route of administration:**

Orally

**K. Stability data:**

Melting point 114C to 116C

Stable (Hazardous Polymerization will not occur)

**L. Formulations:**

**M. Miscellaneous Information:**



Database: Medline &lt;1966 to present&gt;

Set	Search	Results
1	diloxanide furoate.tw.	30
2	stability.tw.	54760
3	1 and 2	0
4	from 1 keep 2,4-5,7,12,15,17,19-21,28	11

&lt;1&gt;

Unique Identifier

97321428

Authors

Qureshi H. Ali A. Baqai R. Ahmed W.

Title

Efficacy of a combined diloxanide furoate-metronidazole preparation in the treatment of amoebiasis and giardiasis.

Source

Journal of International Medical Research. 25(3):167-70, 1997 May-Jun.

Abstract

A combined formulation of diloxanide furoate and metronidazole was used to treat amoebiasis and giardiasis (cysts and vegetative forms) in 54 patients. Of these 34 patients had amoebiasis, 19 had giardiasis and one had mixed infection. Each patient took one tablet (containing 500 mg diloxanide furoate and 400 mg metronidazole), three times daily for 5 days, and the response to therapy was checked by clinical examination and by examination of fresh stools on days 3, 5 and 10. Abdominal pain was completely relieved in 91% and 84% of patients with amoebiasis and giardiasis, respectively, while parasitic clearance was 100% in both groups. Tolerance to the drug was adequate.

&lt;2&gt;

Unique Identifier

97281374

Authors

Bhopale KK. Pradhan KS. Masani KB. Kaul CL.

Title

Additive effect of diloxanide furoate and metronidazole (Entamizole) in experimental mouse caecal amoebiasis.

Source

Indian Journal of Experimental Biology. 33(1):73-4, 1995, Jan.

<3>

Unique Identifier

96319050

Authors

Sengupta M. Sengupta O.

Title

Correlation of biological activity (therapeutic and toxic) with solvochromic properties of metronidazole, emetine hydrochloride and diloxanide furoate.

Source

Indian Journal of Biochemistry & Biophysics. 32(5):302-7, 1995 Oct.

Abstract

Goat blood, when incubated for different periods with diloxanide furoate, metronidazole and emetine hydrochloride, underwent changes in fatty acid constituents and their peroxidation products measured as malonaldehyde. These findings, together with the changes noted in the drug-lipid partition coefficient, are discussed in an attempt to correlate the lipid constitution and biological activity of the drugs.

<4>

Unique Identifier

84122526

Authors

Pehrson P. Bengtsson E.

Title

Treatment of non-invasive amoebiasis. A comparison between tinidazole alone and in combination with diloxanide furoate.

Source

Transactions of the Royal Society of Tropical Medicine & Hygiene. 77(6):845-6, 1983.

Abstract

Tinidazole (40 mg/kg body-weight in one daily dose for five days) and tinidazole (same dose) plus diloxanide furoate (20 mg/kg body-weight divided into three daily doses for 10 days) were compared as treatments for amoebiasis. The parasitic cure rates were 44 and 91% respectively. We cannot, therefore, recommend tinidazole alone in this dosage as a treatment for non-invasive amoebiasis.

<5>

Unique Identifier

than in the non-aspirated group, particularly for patients whose lesion size was more than 6 cm (P less than 0.01). In conclusion, percutaneous needle aspiration is safe, enhances clinical recovery, and accelerates resolution particularly in patients with large abscess cavities.

AN: 91024358

Record 17 of 17 - MEDLINE EXPRESS (R) 1984-1990

TI: Treatment of asymptomatic amebiasis in homosexual men. Clinical trials with metronidazole, tinidazole, and diloxanide furoate.

AU: Thoren-K; Hakansson-C; Bergstrom-T; Johannisson-G; Norkrans-G

SO: Sex-Transm-Dis. 1990 Apr-Jun; 17(2): 72-4

ISSN: 0148-5717

LA: ENGLISH

AB: In a randomized trial, the authors treated 42 asymptomatic homosexual men who had *Entamoeba histolytica* in fecal specimens with either metronidazole or tinidazole (study 1). They treated both groups initially with 2,000 mg in a single dose, and in case of failure with 2,000 mg daily for 5 days. In cases of repeated failure, the authors prescribed a dosage of 500 mg of diloxanide furoate three times per day (TID) for 10 days. In a subsequent study (study 2) the authors treated 49 asymptomatic homosexual men who had *E. histolytica* in fecal specimens with 500 mg of diloxanide furoate TID for 10 days. In study 1, the parasitological cure rates (PCR) for metronidazole and tinidazole were 29%-56%. Among the men treated with diloxanide furoate, the PCR was 93%. In study 2 the PCR with diloxanide furoate was 88%, which was significantly better (P less than .05) than metronidazole/tinidazole treatment in study 1. The present studies show that diloxanide furoate is an effective treatment of amebiasis in asymptomatic patients.

AN: 90296217



## **DILOXANIDE FUROATE**

Mouse oral LD50 >710 mg/kg.

Toxicological properties have not been thoroughly investigated. It has produced vomiting, urticaria, pruritis, flatulence and G.I. distress. May have induced eosinophilia in some people.

Has been used with tinidazole as an antiprotozoal combination.



## REFERENCES

1. Qureshi H, Ali A, Baqai R, et al. Efficacy of a combined diloxanide furoate-metronidazole preparation in the treatment of amoebiasis and giardiasis. *J Intl Med Res* 1997; 25(3):167-70.
2. Bhopale KK, Pradhan KS, Masani KB, et al. Additive effect of diloxanide furoate and metronidazole (Entamizole) in experimental mouse caecal amoebiasis. *Indian J Exp Biol* 1995; 33(1):73-4.
3. Sengupta M, Sengupta O. Correlation of biological activity (therapeutic and toxic) with solvchromic properties of metronidazole, emetine hydrochloride and diloxanide furoate. *Indian J Biochem Biophys* 1995; 32(5):302-7.
4. Pehrson P, Bengtsson E. Treatment of non-invasive amoebiasis. A comparison between tinidazole alone and in combination with diloxanide furoate. *Trans R Soc Trop Med Hyg* 1983; 77(6):845-6.
5. Salaki JS, Shirey JL, Strickland GT. Successful treatment of symptomatic *Entamoeba polecki* infection. *Am J Trop Med Hyg* 1979; 28(2):190-3.
6. Wolfe MS. Nondysenteric intestinal amebiasis. Treatment with diloxanide furoate. *JAMA* 1973; 224(12):1601-4.
7. Botero D. Treatment of intestinal amoebiasis with diloxanide furoate, tetracycline and chloroquine. *Trans R Soc Trop Med Hyg* 1967; 61(6):769-73.
8. Huggins D. [Treatment of amebiasis. Results obtained with diloxanide fuorate]. [Portuguese] *Revista do Instituto de Medicina Tropical de Sao Paulo* 1965; 7(2):110-1.
9. Huggins D. [Treatment of amebiasis. (Results obtained with diloxanide furoate)]. [Portuguese] *Hospital* 1965; 67(5):1107-10.
10. Burchard GD. [Therapy for malaria and amoebiasis]. [Review] [12 refs] [German] *Immunitat und Infektion* 1994; 22(2):45-7.
11. Di Perri G, Strosselli M, Rondanelli EG. Therapy of entamebiasis. *J Chemother* 1989; 1(2):113-22.
12. Chatterjee DK, Iyer SN, Venugopalan B, et al. Antiamoebiv activity of 3,3'-fluro-4,4'-di(pyrrolidine-2-ylidene amino)-diphenyl (liroldine), against experimentally infected intestinal and hepatic amoebiasis. *Indian J Exp Biol* 1997; 35(7):765-70.
13. Bhopale KK, Pradhan KS, Masani KB, et al. A comparative study of experimental caecal amoebiasis and the evaluation of amoebicides. *Ann Trop Med Parasitol* 1995; 89(3):253-9.
14. Anderson MD, Oldfield EC 3<sup>rd</sup>. Luminal agents for invasive amebiasis: nice or necessary? *Am J Gastroenterol* 1993; 88(6):964-5.
15. Sengupta M, Dutta H, Pal DK, et al. Correlation of phospholipid loss in goat whole blood with solvchromic properties of antiamebics like emetine, metronidazole and diloxanide furoate. *Indian J Exp Biol* 1993; 31(1):21-5.
16. Samuelson JC, Burke A, Courval JM. Susceptibility of an emetine-resistant mutant of *Entamoeba histolytica* to multiple drugs and to channel blockers. *Antimicrob Agents Chemother* 1992; 36(11):2392-7.

17. Chacin-Bonilla L. *Entamoeba polecki*: human infections in Venezuela. *Trans R Soc Trop Med Hyg* 1992; 86(6):634.
18. Luaces AL, Pico T, Barrett AJ. The ENZYMEBA test: detection of intestinal *Entamoeba histolytica* infection by immuno-enzymatic detection of histolysain. *Parasitology* 1992; 105 (Pt 2):203-5.
19. Marsden PD. Treatment of cyst passers [letter; comment]. *Clin Infect Dis* 1992; 15(3):559.
20. McAuley JB, Herwaldt BL, Stokes SL, et al. Diloxanide fuorate for treating asymptomatic *Entamoeba histolytica* cyst passers: 14 years' experience in the United States [see comments]. *Clin infect Dis* 1992; 15(3):464-8.
21. McAuley JB, Juranek DD. Luminal agents in the treatment of amebiasis [letter; comment]. *Clin Infect Dis* 1992; 14(5):1161-2.
22. Wahlgren M. *Entamoeba coli* as cause of diarrhoea? [letter] [see comments] *Lancet* 1991; 337(8742):675.
23. Galal SM, Bedair MM, el-Sayed MA. Derivative spectrophotometric determination of antiprotozoal drugs in two-component tablet preparation. *J Pharm Belg* 1991; 46(5):315-9.
24. Freeman O, Akamaguna A, Jarikre LN. Amoebic liver abscess: the effect of aspiration on the resolution or healing time. *Ann Trop Med Parasitol* 1990; 84(3):281-7.
25. Thoren K, Hakansson C, Bergstrom T, et al. Treatment of asymptomatic amebiasis in homosexual men. Clinical trials with metronidazole, tinidazole, and diloxanide fuoroate. *Sex Transm Dis* 1990; 17(2):72-4.
26. Parimoo P, Rasad CV, Gautam A. Simultaneous quantitative determination of metronidazole and diloxanide fuoroate in a tablet preparation by difference spectroscopy. *Int J Pharm* 1996; 134(May 28):213-4.
27. Parimoo P, Umapathi P. Simultaneous quantitative determination of metronidazole and diloxanide fuoroate in tablet preparations by difference spectroscopy. *Drug Dev Ind Pharm* 1996; 20(13):2143-50.
28. Ray S. Estimation of tinidazole and diloxanide fuoroate in single and combined dosage forms by HPLC. *East Pharm* 1989; 32(Sep):125-7.
29. Dutta H, Mehta NK, Gupta MS, et al. Diloxanide fuoroate: studies on its interaction with blood phospholipid in relation to partition coefficients of related analogs. *Indian J Pharm Sci* 1988; 50(Nov-Dec); 328-31.
30. Talwar SK Sharma SC, Das S. Simultaneous spectrophotometric determination of diloxanide fuoroate and metronidazole in dosage forms. *J Pharm Biomed Anal* 1986; 4(4):511-5.
31. McGowan K. How to find and treat amebiasis. *Drug Therapy* 1984; 14(May):159-63, 167, 171-3, 176.
32. Rawlins DA, Kayes JB. Pharmaceutical suspension studies. Part 3. Redispersibility of suspensions. *Int J Pharm* 1983; 13(Jan):171-81.
33. Harron DWG, D' Arcy PF. Amebiasis. *Pharm Int* 1983; 4(May):114-7.

34. Rawlins DA, Kayes JB. Pharmaceutical suspension studies. Part 1. Comparison of adsorption of polyvinyl alcohol at the diloxanide furoate B.P. and polystyrene latex-water interface. *Int J Pharm* 1983; 13(Jan):145-58.
35. Al Sharifi MA, Gilbert JNT, Powell JW. Effect of antiamebic drug therapy on the metabolism of butobarbitone. *J Pharm Pharmacol* 1982; 34(Feb):126-7.
36. Rawlins DA, Kayes JB. Pharmaceutical suspension studies. Part 2. Interaction between particles of diloxanide furoate B.P. coated with an adsorbed polymeric layer. *Int J Pharm* 1983; 13(Jan):159-69.
37. Shah PP, Mehta RC. Colorimetric estimation of diloxanide furoate in pharmaceutical formulations. *Indian J Pharm Sci* 1981; 43(Jul-Aug):147-9.
38. Anon. Availability of immunobiologic agents and antiparasitic drugs form CDC. *Morb Mortal Wkly Rep* 1980; 29(Mar 21).
39. Krogstad DJ, Spencer HC, Healy GR. Ambiasis. *N Engl J Med* 1978; 298 (Feb 2):262-5.
40. Kean BH. Treatment of amebiasis: recurrent agony. *J Am Med Assoc* 1976; 235(Feb 2):501.
41. Anon. Drugs for dysentery. *Br Med J* 1970; 2(Apr 4):36-7.