WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Review article on Medicated chocolate for dual infection therapy.

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ABSTRACT:

The combination of Medicated chocolate for dual infection therapy is effective for treating various bacterial and protozoal infections. Ofloxacin works by blocking certain bacterial enzymes, while Ornidazole damages microbial DNA by producing free radicals. Together, they provide broad coverage for infection in the gastrointestinal and respiratory tracts, among others. However, patients may experience side effects like stomach issues and effects on the central nervous system. Effective management of these treatments requires careful monitoring and educating patients about potential risks. This review discusses how Ofloxacin and Ornidazole work, their uses in clinical settings, their side effects, and how to manage these treatments.

Keywords: -Ornidazole, Ofloxacin, Antibacterial study, Protozoal study, liquid chromatography, comparative assay .

Introduction:-

The palatable paediatric dosage form of Medicated Chocolate for dual infection therapy is formulated the reduce bacterial and protozoal infections. Molecular formula for Ofloxacin $C_{18}H_{20}FN_3O_4$, it is a fluoroquinolone antibiotic & synthetic derivative of quinolone. Molecular formula for Ornidazole is C7H10CN3O3, it is a nitroimidazole derivative. Its main target is to act on both gram-negative and gram-positive bacteria. Ornidazole is the choice of drug for the treatment of giardiasis, trichomoniasis, which is a urogenital tract intestinal infection, and other infections like hepatic amoebiasis and bacterial vaginosis. Its main target is to act against anaerobic bacteria, protozoa, which are determined by infrared absorption spectrophotometry. Both are active ingredients themselves. Ofloxacin is effective against bacteria. Ornidazole is effective against protozoa and anaerobic bacteria. The combination gives a broad spectrum of action, but each drug has its own distinct active ingredient. Ofloxacin shows its action by inhibiting the bacterial DNA gyrase & topoisomerase IV. Inhibiting the enzyme, prevents DNA replication. It reduces bacterial infections. Ornidazole shows its action by producing free radicals inside the microbes, such as hydroxylamine free radicals. After producing free radicals, it damages DNA by breaking the DNA strands and inhibiting protein synthesis. It reduces the protozoal infection. Fluoroquinolone antibiotics diffuse through porin channels into gram-negative bacteria or directly across the membrane in gram-positive bacteria. Its targeted sites are DNA gyrase (topoisomerase II) in Gram-negative bacteria & Topoisomerase IV in Gram-positive bacteria. It is acting against DNA replication- DNA strand breaks accumulate, replication halts, and transcription stops.

Ofloxacin:

Molecular formula: $C_{18}H_{20}FN_3O_4$ **Molecular weight:** 361.37 g/mol

Ofloxacin is (RS)-9-fluoro-3-methyl-10-(4-methylpiperazin-1-yl)-7-oxo-2,3-dihydro-7H-pyrido[1,2,3-de]-1,4-benzoxazine-6-carboxylic acid

Category: - Antibacterial.

Dose: - 200 to 400 mg daily.

Organoleptic properties: -

1. **Appearance –** Crystalline powder
2. **Colour -** A pale yellow or bright yellow
3. **Taste -** Bitter

Formulations to be used :-

1. Ofloxacin Infusion

Ofloxacin Infusion is a sterile solution of Ofloxacin in 5 per cent Dextrose Injection or in Sodium Chloride Injection.

Ofloxacin Infusion contains not less than 90.0 per cent and not more than 120.0 per cent of the stated amount of ofloxacin $C_{18}H_{20}FN_3O_4$.

Frequency of dose: - 25 mg; 50 mg; 100 mg; 200 mg; 400 mg

Tests

pH : 3.8 to 7.5.

Bacterial endotoxins : Not more than 0.88 Endotoxin Units per mg of Ofloxacin.

Other tests : Comply with the tests stated under *Parenteral Preparation (Infusions)*.

Test solution. Dilute the ophthalmic solution, which contained 30 mg of drug (Ofloxacin) in a solvent mixture of 100 ml. Again, dilute 1 ml solution in a 10 ml mixture of solvent.

Reference solution. Solution of ofloxacin, which contains 0.003 % w/v in a solvent mixture.

NOTE — Protect the solutions from the light.

2. Ofloxacin Ophthalmic Solution

Ofloxacin Ophthalmic Solution is a sterile aqueous solution of Ofloxacin.

Usual strength. 0.3 per cent w/w.

Identification

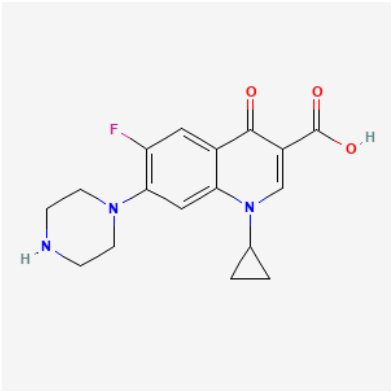
In the Assay, the principal peak in the chromatogram obtained with the test solution corresponds to the peak in the chromatogram obtained with the reference solution.

Tests

pH: 6.0 to 7.2.

Sterility: Comply with the test for sterility.

Ciprofloxacin:-



Molecular formula: $C_{17}H_{18}FN_3O_3$ **Molecular weight:** 331.34 g/mol

Ciprofloxacin is a fluorinated derivative of quinolone.

Category: - Antibacterial.

Dose: - 250 mg, 500 mg, 750 mg daily.

Organoleptic properties: -

1. **Appearance** – Crystalline powder
2. **Colour –** White to pale yellow
3. **Taste** – Bitter

Formulations to be used :-

1) Ciprofloxacin tablet:-

Frequency of dose :-250 mg, 500 mg, 750 mg

Tests

pH: 3.0 to 5.0

Microbial Limit Test: Ensures product is microbiologically safe.

2) Ciprofloxacin Infusion / Injection: -

Frequency of dose: 200 mg/100 mL and 400 mg/200 mL (Infusion), 2 mg/ml(Injection)

Tests

pH: 3.0 to 4.5

Clarity of Solution: No visible turbidity or foreign particles.

Sterility Test: No growth observed.

3) Ophthalmic Formulations (Eye/Ear Use): -

- **Eye Drops:**

Concentration: 0.3% w/v

Tests

pH: 3.5 to 5.5

- **Eye Ointment:**

Concentration: 0.3% w/w

Tests

pH: 4 to 5.5

- **Ear Drops:**

Concentration: 0.2% or 0.3% solution

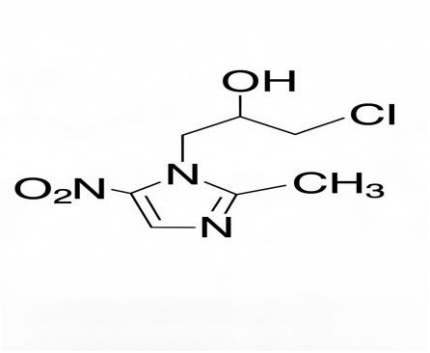
Tests

pH: 3.5 to 5.5

Summary of Chromatographic Conditions

Infusion	ODS, 15 cm × 4.6 mm	NaH_2PO_4 + sodium hexane sulphonates + TEA, pH 3.0 (H_3PO_4) + Acetonitrile	1 ml/min	294	20 µl
Ophthalmic Sol.	ODS, 15 cm × 4.6 mm	20 vol. Acetonitrile + 80 vol. Phosphate buffer (pH 7.25, with TBAHS + Na_2HPO_4)	–	–	–
Oral Suspension	ODS, 10 cm × 4.6 mm	90 vol. KH_2PO_4 buffer (pH 2.4, H_3PO_4) + 10 vol. Acetonitrile	2 ml/min	294	20 µl
Tablets	ODS (similar)	Methanol-based preparation for test and reference solutions	–	294	–

Ornidazole:-



Molecular formula: $C_7H_{10}ClN_3O_3$ **Molecular Weight :**219.6 g/ml

Ornidazole is *(RS)*-1-chloro-3-(2-methyl-5-nitroimidazol-1-yl)propan-2-ol.

Category: Anti-amoebic.

Dose: 500 mg twice a day orally for five days.

Description: A white to yellowish white crystalline powder.

Identification

1. Determine by infrared absorption spectrophotometry.

1. Ornidazole sample: Obtain a pure sample of Ornidazole.

2. KBr pellet preparation: Mix potassium bromide powder with a small amount of Ornidazole. Grind and press: Grind the mixture and press it into a pellet.

1. Compare the spectrum with that obtained with ornidazole RS or with the reference spectrum of ornidazole.

Formulations to be used :-

1. Ornidazole Injection: -

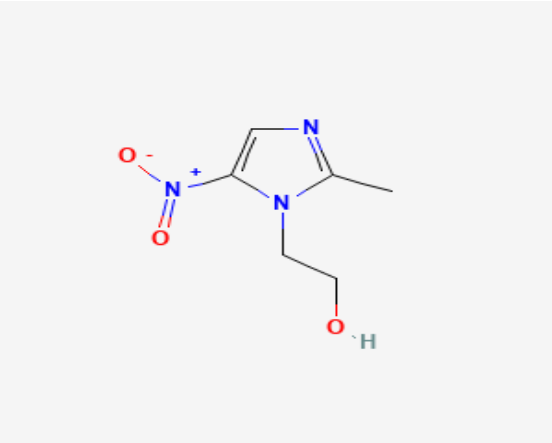
Ornidazole Injection is a sterile solution of Ornidazole in propylene glycol or other suitable glycol, in a suitable mixture of these. It contains suitable alcohols.

Usual Strength: 500 mg per 3 ml
Description: A clear, light yellow coloured solution.

2. **Ornidazole Tablets: -**

Tablets contain not less than 95.0% and not more than 105.0% of the stated amount of Ornidazole (C7H10ClN3O3).
Usual Strength: 500 mg

Metronidazole:-



Molecular Formula: $C_6H_9N_3O_3$ **Molecular Weight:** 171.15 g/mol
Metronidazole is a 5-nitroimidazole; it shows activity against anaerobic microorganisms.
Category: Antiprotozoal
Dose: 250 mg, 400 mg, 500 mg, 750 mg
Organoleptic properties: -

1. **Appearance –** Crystalline powder
2. **Colour –** White to pale yellow
3. **Taste –** Bitter

Formulations to be used :-

1) **Metronidazole tablet: -**

Frequency of dose: 250 mg, 400 mg, 500 mg, 750 mg
Tests
pH: 4.0 to 6.0
Microbial Limit Test: Ensures product is microbiologically safe.

2) **Metronidazole IV Injection: -**

Frequency of dose: 500 mg/100 mL, 1 g/100 mL
Tests
pH: 4.0 to 6.0
Clarity of Solution: No visible turbidity or foreign particles.
Sterility Test: No growth observed.

3) **Metronidazole Suspension:**

Concentration: 50 mg/mL, 100 mg/5 mL
Tests
pH: 4.0 – 5.5

Conclusion:

The combination of medicated chocolate containing Ofloxacin and Ornidazole offers a promising and palatable approach for dual infection therapy, particularly in paediatric patients. Ofloxacin provides broad-spectrum antibacterial activity by inhibiting bacterial DNA gyrase and topoisomerase IV, while Ornidazole effectively targets protozoal and anaerobic infections through free-radical–mediated DNA damage. Together, these agents deliver a synergistic therapeutic effect against a wide range of gastrointestinal, urogenital, and respiratory infections.
The review highlights the physicochemical properties, dosage forms, analytical parameters, and pharmacological profiles of both drugs, confirming their stability, efficacy, and compatibility for combined formulations. While the combination enhances patient compliance and therapeutic coverage, it also requires careful monitoring due to possible gastrointestinal and CNS-related side effects. Overall, medicated chocolate emerges as an innovative dosage form that improves acceptability without compromising therapeutic effectiveness, making it a valuable option for dual infection management.

Result:

This review article discusses the combination of Ofloxacin and Ornidazole in a palatable dosage form (Medicated Chocolate) for treating bacterial and protozoal infections.
The combination of Ofloxacin and Ornidazole is effective for treating various bacterial and protozoal infections. The medicated chocolate is formulated as a palatable paediatric dosage form to reduce bacterial and protozoal infections.

Acknowledgement:

Authors (Radhika S. Borate, Prajakta Borkar, Nikita M. Gade) are grateful to Riya A. Bharate, Assistant Professor, Department of Pharmaceutics, Dr. Babasaheb Ambedkar Technological University Lonere, Vidya Niketan College of Pharmacy, Lakhewadi.

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