



REVIEW ARTICLE

AMOXICILLIN TRIHYDRATE CAPSULE- A CHOICE OF DRUG FOR USEFUL FOR THE TREATMENT OF BACTERIAL INFECTIONSMrinal Kumar Singh ^{1*}, Girendra Gautam ², Amit Kumar Mishra ³, Ashish Kumar Mishra ^{4*}¹M.Pharm. Research Scholar, Bhagwant Institute of Pharmacy, M. Nagar, (U.P) India² Professor, Bhagwant Institute of Pharmacy, M. Nagar, (U.P) India³Associate Professor, Bhagwant Institute of Pharmacy, M. Nagar, (U.P) India⁴M.Pharm Research Scholar, Bhagwant Institute of Pharmacy M. Nagar, (U.P) India**Received 21 June 2014; Accepted 3 July 2014****ABSTRACT**

The Aim of present investigation was to formulate moderate spectrum bacteriolytic activity. Each hard gelatin capsule of Amoxicillin Trihydrate was prepared with the addition of different excipients like microcrystalline cellulose phosphate (102), Magnesium stearate, Sodium Lauryl Sulphate, Aerosil. The excipients were used for this study was based on the compatibility studies. The optimized batch was passes all the evaluation parameters and stability studies

Key words: Amoxicillin Trihydrate, Hard Gelatin Capsule, method, mode of action, uses, adverse drug reaction.

INTRODUCTION:

Amoxicillin was one of several semisynthetic derivatives of 6-aminopenicillanic acid (6-APA) developed at Beecham in the 1960s. It became available in 1972, and was the second aminopenicillin to reach the market (after ampicillin in 1961). Co-amoxiclav became available in 1981. The amoxicillin molecular formula is $C_{16}H_{19}N_3O_5S \cdot 3H_2O$, and the molecular weight is 419.45. Amoxicillin or amoxicillin and abbreviated amox, is an antibiotic useful for the treatment of a number of bacterial infections. It is a moderate-spectrum, bacteriolytic, β -lactam antibiotic in the aminopenicillin family used to treat susceptible Gram-positive and Gram-negative bacteria. It is usually the drug of choice within the class because it is better-absorbed, following oral administration, than other β -lactam antibiotics. Amoxicillin is susceptible to degradation by β -lactamase-producing bacteria, which are resistant to a narrow spectrum of β -lactam antibiotics, such as penicillin.

Material & method:

Capsules: Each hard gelatin capsule contains amoxicillin trihydrate equivalent to amoxicillin anhydrous 250 mg or 500 mg. **Inactive ingredients:** microcrystalline cellulose phosphate, black iron oxide, colloidal silicon dioxide, croscarmellose sodium, D&C Yellow No. 10, FD&C Yellow

No. 6, gelatin, magnesium stearate, Talcum, Aerosil, shellac, sodium lauryl sulfate and titanium dioxide. Before filling mixing & testing required.

Filling in hard gelatin capsule like size 2,1,0 capsule as per claim by different machine manual, SA9, 150 machine

Evaluation standard:

Amoxicillin Capsules contain not less than 90.0 per cent and not more than 110.0 per cent of the stated amount of amoxicillin, $C_{16}H_{19}N_3O_5S$. Identification shake a quantity of the contents of the capsules containing 0.5 g of amoxicillin with 5 ml of water for 5 minutes, filter, wash the residue first with ethanol and then with ether and

dry at a pressure not exceeding 0.7 kPa for 1 hour.

Clinical Pharmacology:

Amoxicillin diffuses readily into most body tissues and fluids, with the exception of brain and spinal fluid, except when meninges are inflamed. The half-life of amoxicillin is 61.3 minutes. Most of the amoxicillin is excreted unchanged in the urine; its excretion can be delayed by concurrent administration of probenecid. In blood serum, amoxicillin is approximately 20% protein-bound.

Orally administered doses of 250 mg and 500 mg amoxicillin capsules result in average peak blood levels 1 to 2 hours after administration in the range of 3.5

mcg/mL to 5 mcg/mL and 5.5 mcg/mL to 7.5 mcg/mL, respectively.

Mechanism of action (Beta-lactam antibiotic amoxicillin):

This drug acts by inhibiting the synthesis of bacterial cell walls. It inhibits cross-linkage between the linear peptidoglycan polymer chains that make up a major component of the cell walls of both Gram-positive and Gram-negative bacteria. It has two ionizable groups in the physiological range (the amino group in alpha-position to the amide carbonyl group and the carboxyl group).

Uses in condition of following micro-organism:

- Aerobic Gram-Positive Microorganisms: Enterococcus faecalis
- Staphylococcus spp.† (β-lactamase-negative strains only)
- Streptococcus pneumoniae
- Streptococcus spp. (α- and β-hemolytic strains only)
- Aerobic Gram-Negative Microorganisms:
- Escherichia coli (β-lactamase-negative strains only)
- Haemophilus influenzae (β-lactamase-negative strains only)
- Neisseria gonorrhoeae (β-lactamase-negative strains only)
- Proteus mirabilis (β-lactamase-negative strains only)
- Helicobacter: Helicobacter pylori

Indication & usage:

Amoxicillin is indicated in the treatment of infections due to susceptible (β-lactamase-negative) strains of the designated microorganisms in the conditions listed below: Infections of the ear, nose, and throat - due to Streptococcus spp. (α- and β-hemolytic strains only), S. pneumoniae, Staphylococcus spp., or H. influenzae. Infections of the genitourinary tract - due to E. coli, P. mirabilis, or E. faecalis. Infections of the skin and skin structure - due to Streptococcus spp. (α- and β-hemolytic strains only), Staphylococcus spp., or E. coli. Infections of the lower respiratory tract - due to Streptococcus spp. (α- and β-hemolytic strains only), S. pneumoniae, Staphylococcus spp., or H. influenzae. Gonorrhea, acute uncomplicated (ano-genital and urethral infections) - due to N. gonorrhoeae (males and females).

Amoxicillin is used in the treatment of a number of infections, including acute otitis media, streptococcal pharyngitis, pneumonia, skin infections, urinary tract infections, Salmonella infections, Lyme disease, and chlamydia infections. It is also used to prevent bacterial endocarditis in high-risk people having dental work done, to prevent Streptococcus pneumoniae and other encapsulated bacterial infections in those without spleens, such as people with sickle-cell disease, and for both the prevention and the treatment of anthrax.

Side effects:

- Common: More than 1 in 100 people who take Amoxicillin trihydrate
 - Diarrhoea
 - Nausea
 - Skin rash or rashes - erythematous rashes have been reported in people with glandular fever
 - Uncommon: More than 1 in 1000 people who take Amoxicillin trihydrate
 - itching
 - urticaria
 - vomiting
 - Very rare: Fewer than 1 in 10,000 people who take Amoxicillin trihydrate
 - abnormal laboratory test results
 - allergic or hypersensitivity reactions such as angioedema, vasculitis or anaphylactic reactions - some of these reactions may be fatal. You should seek medical advice if you get hypersensitivity reactions
 - black hairy tongue
 - blood and bone marrow problems
 - changes in blood clotting time
 - changes to teeth colour - this may happen in children and can usually be removed by brushing the teeth
 - colitis
 - convulsions
 - feeling dizzy
 - hyperactivity
 - jaundice
 - kidney problems
 - liver problems
 - pseudomembranous colitis
1. skin and mucous membrane infection
 2. skin problems including erythema multiforme, certain types of dermatitis

Discussion:

- Amoxicillin trihydrate is used to treat or prevent certain types of bacterial infections. It works by killing certain types of bacteria.
- Do not share your medicine with other people. It may not be suitable for them and may harm them.
- The pharmacy label on your medicine tells you how much medicine you should take. It also tells you how often you should take your medicine. This is the dose that you and your prescriber have agreed you should take. You should not change the dose of your medicine unless you are told to do so by your prescriber.

- If you feel that the medicine is making you unwell or you do not think it is working, then talk to your prescriber. Amoxicillin trihydrate is not suitable for everyone and some people should never use it. Other people should only use it with special care. It is important that the person prescribing this medicine knows your full medical history.
- As part of the process of assessing suitability to take this medicine a prescriber may also arrange tests: to determine whether or not the medicine is suitable and whether it must be prescribed with extra care to check that this medicine is not having any undesired effects Over time it is possible that Amoxicillin trihydrate can become unsuitable for some people, or they may become unsuitable for it. If at any time it appears that Amoxicillin trihydrate has become unsuitable, it is important that the prescriber is contacted immediately.

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