SULFONAMIDES, ERYTHROMYCIN AND TETRACYCLINE

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SULFONAMIDES

I. CLASSIFICATION - ORAL/PARENTERAL
   A. Sulfisoxazole (Gantrisin®, Sk-Soxazole®)
   B. Sulfamethoxazole (Gantanol®)
   C. Sulfacytine (Renoquid®)
   D. Sulfamethizole (Thiosulfil®)
   E. Phthalylsulfathiazole (Sulfathalidine®)
   F. Sulfasalazine (Azulfidine®)
   G. Sulfadiazine

II. CLASSIFICATION - TOPICAL
   A. Sulfacetamide (Bleph®, Isopto®, Cetamide®)
   B. Silver Sulfadiazine Cream (Silvadene®)
   C. Mafenide Acetate Cream (Sulfamylon®)

III. MAIN INDICATIONS - TOPICAL AGENTS
   A. Used topically to reduce microfine colonization and infection of *burn* wounds. Silver Sulfadiazine is agent of choice here.
   B. Topical application for prophylaxis following nail avulsion or chemical matricectomies as well as for topical therapy.

IV. MAIN PROPERTIES/ADVANTAGES
   A. Silver Sulfadiazine - Silver released slowly in concentrations toxic to the microorganisms.
   B. Mefanide - Competitive antagonist in enzymatic pathology for bacterial reproduction.
   C. Both are broad - spectrum agents. Active against *Pseudomonas aeruginosa* and fungi.
   D. Bacteriostatic

V. DISADVANTAGES
   A. Silver Sulfadiazine Cream - Burning, rash, and itching.
   B. Mefanide Cream - Intense pain on application, allergic reactions, fluid loss by evaporation.

VI. GUIDELINES FOR CLINICAL USE
   A. Topical application only.
   B. Should not be used to treat an established infection.

VII. DOSAGE
   A. Topical application to a 1-2mm thickness
   B. Apply up to once or twice daily.

TRIMETHOPRIM - SULFAMETHOXAZOLE (TMP - SMX)

I. CLASSIFICATION
   A. TMP - SMX (Septra®, Bactrim®)

II. MAIN INDICATIONS
   A. Soft tissue infections requiring broad spectrum coverage where there is an allergy to other appropriate agents *or* where sensitivity studies find the infecting organism susceptible to TMP - SMX.
   B. The two agents work synergistically to achieve bacteriocidal effect.
   C. Oral preparation usually fairly well tolerated.
   D. Mean half life 10-12 hours (normal renal function)
   E. Optimal synergistic ratio is 1:5 to 1:4 (TMP/SMX)
   F. Excreted in the urine.

IV. DISADVANTAGES
   A. Can potentiate the anticoagulant effects of coumnadin and the hypoglycemic effects of sulfonylureas.

B. Can interfere with and deteriorate renal function.

V. ADVERSE EFFECTS
   A. GI upset (nausea) in about 5% of patients
   B. Principle reactions: 75% are dermatologic, 3% experience rash; severe reactions include exfoliative dermatitis, Stevens-Johnson Syndrome, and toxic epidermal necrolysis (Lyell's Syndrome)
   C. Skin rash for TMP differs from that for SMX.
   D. Rare hematologic and CNS reactions.
   E. May trigger asthma in sulfite-sensitive individuals.

VI. GUIDELINES FOR CLINICAL USAGE/ MONITORING
   A. Preparations
      1. Tablets
         a. 80mg TMP/ 400mg SMX
         b. 160mg TMP/ 800mg SMX (DS)
      2. Oral Suspension
         a. 40mg TMP/ 200mg SMX per 5ml.
   B. Dosage must be reduced in patients with renal insufficiency.

VII. DOSAGE SCHEDULE
   A. Usual Adult Dose - Septra DS or Bactrim DS 160 TMP/ 800 SMX q 12h for 10-14 days.

TETRACYCLINE

I. CLASSIFICATION
   A. Chlortetracycline (Aureomycin®)
   B. Oxytetracycline (Terramycin®)
   C. Tetracycline (Achromycin®, Tetracyn®)
   D. Demeclocycline (Declomycin®)
   E. Methacycline (Rondomycin®)
   F. Doxycycline (Vibramycin®)
   G. Minocycline (Minocin®, Vectrin®)

II. MAIN INDICATIONS
   A. Tetracyclines are *not* first line antibiotics for podiatric bacterial infections due to rapid induction of resistance and availability of superior agents.
   B. Broad spectrum of activity including gram + and gram - organisms as well as a variety of non-bacterial microorganisms.
   C. Not first choice but usually effective against anaerobes such as anaerobic strep, Clostridia, and Bacteroides.

III. MAIN PROPERTIES/ADVANTAGES
   A. Effective orally.
   B. Variable absorption from GI tract: Chlortetracycline (30%), oxytetracycline and tetracycline (60-80%), doxycycline (95%), minocycline (100%)
   C. Few serious adverse reactions
   D. Excreted in urine and feces, especially urine.
   E. Half life for tetracycline is 6-9 hours except doxycycline or minocycline (17-20 hours)

IV. DISADVANTAGES
   A. Absorption impaired by milk products, antacids, calcium, magnesium, iron (chelation).
   B. Extensive and rapid resistance developed by many bacteria especially gram +.

V. ADVERSE EFFECTS
   A. Teeth and bone staining, especially in children under 8 years and in developing babies when the mother ingests tetracycline (chelation).
   B. Phototoxicity and onycholysis due to concentration in the skin.
   C. GI irritation: epigastric burning and distress, abdominal discomfort, nausea and vomiting (dose related).
   D. Diarrhea - Differentiate from supra-infection and pseudomembranous colitis.
   E. Hepatic Toxicity, especially in pregnant women.
   F. Skin reactions (rare): rashes, urticaria, fixed drug eruptions, and exfoliative dermatitis.
   G. Cross sensitization among the tetracyclines is universal.
   H. Minocycline can cause vestibular toxicity.

VI. GUIDELINES FOR CLINICAL USAGE
   *A. Tetracyclines are *not* first line antibiotics for podiatric bacterial infections.
   B. Not to be taken with milk products, antacids, etc.
   C. Contraindicated in children under 8 years and in pregnant women.

VII. DOSAGE SCHEDULES
   A. Tetracycline, oxytetracycline, demeclocycline 250-500mg q 6h.
   B. Doxycycline
      1. 100mg q 12h first day
      2. 100-200mg qd
   C. Minocycline - 100mg q 12h.

ERYTHROMYCIN

I. CLASSIFICATION
   A. Erythromycin base (Ilotycin®, Robimycin®, Kesso-mycin®, E-Mycin®, ERYC®)
   B. Erythromycin Stearate (Bristamycin®, Ethril®, Pfizer-E®, Erypar®)
   C. Erythromycin Ethylsuccinate (Pediamycin®, Erythrocin®)
   D. Erythromycin Estolate (Ilosone®)

II. MAIN INDICATIONS
   A. Alternative antibiotic for penicillin allergic patients. Rare and mild adverse effects.
   B. Appropriate alternate for gram + streptococcal and, Staphylococcus skin and soft tissue infections.
   C. Also effective against *Clostridium tetanii* and Bacteroides.
   D. Indicated as drug of choice for several dermatologic infections: erysipelas (Strep), erythrasma (Corynebacterium) bullous impetigo (Staph/Strep), and erysipelothrix (Erysipelothrix insidiosa)
   E. Alternate oral antibiotic to amoxicillin for endocarditis prophylaxis.
   F. Bacteriostatic

III. MAIN PROPERTIES/ADVANTAGES
   A. Narrow spectrum, gram +.
   B. Instability in gastric secretions leads to erratic absorption. Enteric coated tablets used to protect base until it reaches upper small intestine where it is absorbed.
   C. Salts and esters formulated to counter adverse effects of gastric acidity.
   D. Serum half life 1.4 hours.
   E. Concentrated in the liver and excreted in the bile and feces.

IV. DISADVANTAGES
   A. Instability in high acid gastric secretions.
   B. Rapid resistance develop by Staph organisms during treatment.
   C. Can elevate SGOT

V. ADVERSE EFFECTS
   A. GI irritation: epigastric distress, nausea, vomiting, diarrhea.
   B. Allergic reactions: Fever, eosinophilia, skin eruptions.
   C. Estolate formulation can cause cholestatic hepatitis.

VI. GUIDELINES FOR CLINICAL USAGE
   A. Should not be given simultaneously with penicillin due to antagonism.
   B. Enteric coated (E-Mycin®) and timed release (ERYC®) preparations cause least GI irritation.
   C. Avoid food for one hour before or after taking erythromycin base. Food is acceptable for salt and ester forms.

VII. DOSAGE SCHEDULES
   A. Usual dose is 250-500mg q 6h.
   B. Endocarditis prophylaxis: 1g 2 hours before procedure and 500mg 6 hours after.