

Review on the Dapsone

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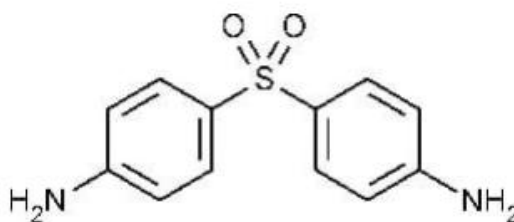
Abstract: *The only remaining sulfone used in anthropoid therapy is dapsone (4,4'-diaminodiphenylsulfone), which is commercially available in an oral formulation, an inhalation preparation, and a 5% or 7.5% cream. Dapsone is widely used to treat leprosy and other chronic inflammatory dermatological conditions. The natural history of IgA vasculitis is normally self-limiting; nevertheless, one-third of patients experience symptom recurrence and refractory conditions. Dapsone is employed in dermatology and other sectors due to its anti-inflammatory effects, which were found in inflammatory animal models. As a result, dapsone clearly performs two functions. Dapsone's therapeutic applicability is primarily dictated by its pharmacology and mechanisms of action, as well as chronic conditions other than dermatology. The trial involved 80 people (54 leprosy and 26 non-leprosy patients) who were given dapsone 100 mg orally*

Keywords: Dapsone

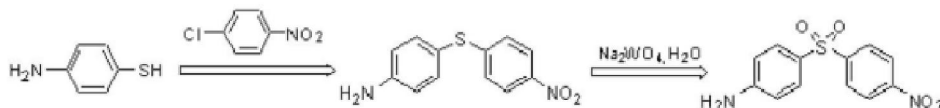
I. INTRODUCTION

Dapsone is the primary medication in a multidrug regimen recommended by the World Health Organization for the treatment of leprosy. Dapsone was first studied as an antibiotic in 1937. Its use to treat leprosy started in 1945. It is on the World Health Organization's list of essential drugs. The oral form is available as a generic drug and is reasonably priced. Historical perspective. In 1908, Fromm and Wittmann synthesized dapsone. From 1936 to 1996, dapsone was used to treat a variety of conditions, including tuberculosis, leprosy, malaria, and AIDS-related pneumonia. This article describes how dapsone progressed from a disease cure to a treatment for a novel ailment. Dapsone was developed. Dapsone was initially synthesized in 1908.

Structure of Dapsone



Synthesis of Dapsone :



In the early twentieth century, German chemist Paul Ehrlich proposed theories of selective toxicity based on the ability of specific colors to kill microorganisms. Gerhard Domagk discovered antibacterial prontosil red (sulfonamidochrysoidine) in 1932, earning him a Nobel Prize. In 1935, Daniel Bovet and his team at the Pasteur

Institute discovered the active drug, sulfanilamide of Prontosil. Later, Ernest Fourneau and Gladwin Buttle separately found dapsone in France and the United Kingdom.

Clinical Data: Trade Name: Aczone, Others. Route of Administration: Oral, topical

Legal Status: Legal status: USRx only in general (Rx prescription required). Pharmacokinetic Data: Bioavailability: 70-80%. Protein binding: 70-90%. Metabolism: Liver Elimination. Half life: 20-30 hours. Excretion: kidney identifies: The IUPAC name is 4-[(4-aminobenzene) sulfonyl] aniline. Chemical and Physical Data: Formula: C₁₂H₁₂N₂O₂S. Molar mass: 248.30 g/mol. melting point: 175 to 176 degrees Celsius (347 to 349 degrees Fahrenheit). Dapsone inhibits bacterial dihydrofolic acid formation by competing with para-aminobenzoate for the active site of dihydropteroate synthase, which prevents nucleic acid synthesis. Despite structural variations, sulfonamide-based antibacterial medications perform similarly to dapsone. Dapsone is an anti-inflammatory that inhibits the cytotoxic mechanism mediated by myeloperoxidase-H₂O₂-halide in polymorphonucleocytes. During neutrophils' respiratory burst, myeloperoxidase converts hydrogen peroxide (H₂O₂) into hypochlorous acid (HOCl), which is used to destroy bacteria. Neutrophils generate the most potent oxidant, HOCl, which can cause tissue damage during inflammation. Dapsone induces an inactive intermediate state in myeloperoxidase, reversibly inhibiting it. This reduces the development of hypochlorous acid, reducing tissue damage during inflammation. Inhibiting myeloperoxidase may help to lessen inflammation in neurodegenerative diseases while protecting neurons.

Take this medication by mouth, with or without food, usually once a day, or as directed by your doctor. Antacids, ranitidine, famotidine, and didanosine, as well as other medications for heartburn or stomach acid reduction, may impair dapsone absorption and effectiveness. Separate your dapsone dose from any of these products, which will last at least two hours. For more information, speak with your doctor or pharmacist. If you are taking dapsone to treat a skin disorder, your doctor may start with a low dose and gradually raise it to manage your condition. Taking this drug to treat Hansen's disease or prevent HIV infection is usually a long-term treatment.

Proposed use in antimalarial medications: The spread of drug-resistant malaria in Africa has encouraged the development of new, low-cost antimalarial drugs. Plasmodium falciparum, a malaria parasite, has developed resistance to chloroquine and pyrimethamine, two of the most often used malaria treatments.

Dapsone gel: Although dapsone has been proved to treat acne, the risk of haemolytic anaemia prohibits widespread use. For many years, scientists worked to create a topical formulation of dapsone that was as effective against acne as oral dapsone but without the haemolytic side effect. This was difficult to do since dapsone is particularly insoluble in aqueous solutions. In the early 2000s, QLT USA created Aczone, a 5% dapsone gel that efficiently treats acne while without drastically reducing haemoglobin levels, even in people with G6PD impairment. In February 2016, the FDA approved a 7.5% dapsone gel. This increased strength has the advantage of just needing to be applied once a day, rather than twice. Hypersensitivity reactions occur in 1.4% of people treated with dapsone, and can be fatal.

Homolysis is the most common side effect, occurring in around 20% of people treated with dapsone, albeit it is dose-dependent. It may cause haemolytic anaemia and methemoglobinemia. The side effect is more common and severe in patients with glucose-6-phosphate dehydrogenase insufficiency; hence the dapsone-containing antimalarial combination Lapdap was discontinued from clinical usage. Dapsone in breast milk caused hemolysis in a neonate, according to reports. Agranulocytosis is uncommon when dapsone is administered alone, but more common in combination regimens for malaria prophylaxis. Although abnormalities in white blood cell production, such as aplastic anaemia, are uncommon, they account for the vast majority of deaths associated with dapsone therapy. Methemoglobinemia affects approximately 15% of people treated with long-term dapsone at conventional doses (100 mg/day). Only specialized multi-wavelength oximeters (CO-oximeters) can detect methemoglobinemia directly. When there is a "saturation gap" between a low conventional pulse oximeter value and a high arterial blood gas analyser result, methemoglobinemia may be considered. Liver:- The manufacturer reported toxic hepatitis and cholestatic jaundice. These hazardous reactions may also occur as part of the dapsone hypersensitivity syndrome (a type of SCARs, as discussed above) or dapsone syndrome (described below). Dapsone is metabolized by the Cytochrome P450 system, which includes isozymes CYP2D6, CYP2B6, CYP3A4, and CYP2C19. Dapsone metabolites produced by the cytochrome P450 2C19 isozyme have been linked to methemoglobinemia, a medication adverse effect. Skin: - When

applied topically, dapsone can cause mild skin irritation, redness, dryness, burning, and itching. When used with benzoyl peroxide products, transient yellow or orange skin discoloration may develop.

Other side effects include usual symptoms such as nausea, headache, and rash, as well as insomnia, psychosis, and peripheral neuropathy. Lung effects are infrequent and can be substantial, but they are usually reversible. Dapsone Hypersensitivity Syndrome: Certain patients experience hypersensitivity reactions. This reaction may be more common in people undergoing multiple-drug therapy. The reaction is always characterized by a rash, although it may also include fever, jaundice, and eosinophilia. It is most likely one manifestation of the SCARs reaction, known as the DRESS syndrome (see above). In general, these symptoms will appear within the first six weeks of medication or not at all and may be alleviated by corticosteroid therapy. Before Using Dapsone (Tablet): The hazards of taking a drug must be evaluated against the benefits it will provide. This is a decision that you and your doctor will make. The following should be taken into account while considering this medication: •Allergies:- Inform your doctor if you have ever experienced an unusual or adverse reaction to this or any other medication. Also, notify your doctor if you have any other allergies, such as to foods, colors, preservatives, or animals. For non-prescription products, carefully study the ingredients on the label or packaging.

•Pediatric:-While there is no particular information comparing the use of dapsone in children to other age groups, this medication is not predicted to cause different side effects or issues in children than it does in adults.

• Geriatric Drug Interactions: Although certain medicines should never be combined, two separate medicines may be used together even if an interaction occurs. In certain circumstances, your doctor may wish to adjust the dosage or take further measures. Combining this medication with any of the following medications is generally not recommended, but it may be necessary in some instances. If both medications are prescribed simultaneously, your doctor may adjust the dose or frequency with which you take one or both of them.

• Warfarin, Zidovudine taking this medicine with any of the following medications may raise your risk of some adverse effects, but combining both treatments may be the best option for you. If both medications are provided concurrently, your doctor may adjust the dosage or frequency with which you take one or both of them.

- Amprenavir
- Atazanavir
- Fosamprenavir
- Rifabutin
- Rifapentine

Other Interactions: specific medicines should not be used at or near the time of consuming meals, or with specific types of food, because interactions may occur. Combining alcohol or tobacco with certain medications may also result in interactions. Consult your healthcare provider about taking your drug with food, drink, or tobacco. Other Medical Problems: Other medical conditions may have an impact on how this medication is used. Inform your doctor if you have any other medical conditions, particularly: Severe anaemia, glucose-6-phosphate dehydrogenase (G6PD) deficiency, Methemoglobinreductase deficiency increases the risk of serious blood diseases and reduces the lifespan of red blood cells. Liver disease—Dapsone may occasionally induce liver damage. Storage: Keep the medication in a closed container at room temperature, away from heat, moisture, and direct light. Keep from freezing. Keep out of reach of youngsters. Do not keep expired or no longer needed medicines.

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