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Medicine

GREEN COW DUNG POWDER- (Malachite greenpoisoning) - STUDY OF CLINICAL PROFILE, AND STATREGIES OF MANAGEMENT

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ABSTRACT

Introduction; Malachite green is an organic compound that is used as a dyestuff and controversially as an antimicrobial in aquaculture. Malachite green is traditionally used as a dye for materials such as silk, leather, and paper. Although called malachite green, this dye is not prepared from the mineral malachite - the name just comes from the similarity of colour Malachite green is a tasteless , odour less water soluble ,easily available household highly lethal poison which ia a suicidal agent causing morbidity and mortality of HUNDREDS OF people in Coimbatore Tirupur and Erode districts of western part of Tamilnadu every year Aim of the study this is a prospective study to analyze the clinical presentations , biochemical changes in patients with green cow dung powder poisoning, Materials and methods all the patients admitted in tertiary care govt medical college hospitals with history of alleged cowdung powder poisoning are taken for study Results . As there are no specific antidotes for chemicals such as the synthetic cow dung powder, we would like to mention the usefulness of alkalinization of urine in synthetic cow dung powder poisoning. The dye in cow dung powder has weak acidity and if ingested orally, major component of it gets eliminated through renal excretion.[2] Alkalinisation promotes the solubility of dye, especially malachite green which otherwise gets precipitated in the kidney and results in renal failure. Hence, it is worth to administer soda bicarbonate which enhances excretion of the component through urinary alkalinisation.[2] Moreover, early administration of soda bicarbonate minimizes the distribution of toxins into other tissues and enhances elimination of the toxins that exist in equilibrium between an ionized and unionized state.[3] As the unionized toxins cross cellular barriers and lead to increased toxicity, it is good to keep the toxins in an ionized state which is theoretically desirable. Hence, serum alkalinisation reduces the distribution of the toxin/dye into the central nervous system and curtails the occurrence of seizures.[4] As the ionized form has low lipid and high water solubility, it remains "trapped" in the renal tubules and thereby prevents resorption of the toxins by the kidneys and enhances elimination in urine. This concept is often referred to "ion trapping." Hence, we suggest the use of continuous infusions of soda bicarbonate to prevent the undue events in cow dung powder poisoning.[4] Moreover, the practitioners have to be informed to motivate their cases for follow-up, in view of its cytotoxicity and teratogenicity. As these types of poisoning contribute to morbidity and mortality, translational research activities have to be undertaken on these toxins, and therapeutic guidelines have to be provided. Many a time, locally available materials may be helpful as observed in cow dung powder poisoning.[4] The old adage "when there is a will, there is a way" holds good for synthetic cow dung poisoning.

KEYWORDS :

Uses

Malachite green is traditionally used as a dye. Millions of kilograms of MG and related triarylmethane dyes are produced annually for this purpose.[3]

MG is active against the oomycete Saprolegnia, which infects fish eggs in commercial aquaculture, MG has been used to treat Saprolegnia and is used as an antibacterial.[4] It is a very popular treatment against Ichthyophthirius multifiliis in freshwater aquaria. The principal metabolite, LMG, is found in fish treated with malachite green, and this finding is the basis of controversy and government regulation. See also Antimicrobials in aquaculture.

MG has frequently been used to catch thieves and pilferers. The bait, usually money, is sprinkled with the anhydrous powder. Anyone handling the contaminated money will find that on upon washing the hands, a green stain on the skin that lasts for several days will result.

Numerous niche applications exploit the intense color of MG. It is used as a biological stain for microscopic analysis of cell biology and tissue samples. In the Gimenez staining method, basic fuchsin stains bacteria red or magenta, and malachite green is used as a blue-green counterstain. Malachite green is also used in endospore staining, since it can directly stain endospores within bacterial cells; here a safranin counterstain is often used. Malachite green can also be used as a saturable absorber in dye lasers, or as a pH indicator between pH 0.2–1.8. However, this use is relatively rare. Leuco-malachite green (LMG) is used as a detection method for latent blood in forensic science. Hemoglobin catalyzes the reaction between LMG and hydrogen peroxide, converting the colorless LMG into malachite green. Therefore, the appearance of a green color indicates the presence of blood.[5]

In 1992, Canadian authorities determined that eating fish contaminated with malachite green posed a significant health risk.[6] Malachite green was classified a Class II Health Hazard. Due to its low manufacturing cost, malachite green is still used in certain countries with less restrictive laws for nonaquaculture purposes. In 2005, analysts in Hong Kong found traces of malachite green in eels and fish imported from China and Taiwan. In 2006, the United States Food and Drug Administration (FDA) detected malachite green in seafood imported from China, among others, where the substance is also banned for use in aquaculture. In June 2007, the FDA blocked the importation of several varieties of seafood due to continued malachite green contamination.[7] The substance has been banned in the United States since 1983 in food-related applications. It is banned in the UK, also.[8] Animals metabolize malachite green to its leuco form. Being lipophillic (the leuco form has a log P of 5.70) The metabolite is retained in catfish muscle longer (HL = 10 days) than is the parent molecule (HL = 2.8 days

TOXICITY

The LD50 (oral, mouse) is 80 mg/kg.[citation needed] Rats fed malachite green experience "a dose-related increase in liver DNA adducts" along with lung adenomas. Leucomalachite green causes an "increase in the number and severity of changes". As leucomalachite green is the primary metabolite of malachite green and is retained in fish muscle much longer, most intake of malachite green would be in the leuco form. During the experiment, rats were fed up to 543 ppm of leucomalachite green, an extreme amount compared to the average 5 ppb discovered in fish. After a period of two years, an increase in lung adenomas in male rats was discovered but no incidences of liver tumors. Therefore, it could be concluded that malachite green caused carcinogenic symptoms, but a direct link between malachite green and liver tumor was not established.[9]

Malachite green is a dye that is both carcinogenic and genotoxic (i.e. damaging to DNA). It has been used globally for therapeutic treatment in aquaculture, but is unauthorised for use in food-producing animals in the EU.

EFSA's Panel on Contaminants in the Food Chain assessed the risks to consumers from malachite green in food, particularly in fish, fish products and crustaceans. Specifically, the European Commission asked EFSA to evaluate whether a reference value of 2 micrograms (µg) of malachite green per kilogram of food would adequately protect public health. EFSA's experts concluded that it is unlikely that exposure to food contaminated with malachite green up to 2µg/kg would represent a health concern.

Names
IUPAC name
4-{[4-(Dimethylamino)phenyl](phenyl)methylidene}-N,N-dimethylcyclohexa-2,5-dien-1-iminium chloride
Other names
Aniline green; Basic green 4; Diamond green B; Victoria green B

Identifiers	
CAS Number	569-64-2
3D model (Jmol)	Interactive image
ChemSpider	10820
ECHA InfoCard	100.008.476
PubChem CID	11294
UNII	12058M7ORO
InChI[show]	
SMILES[show]	

Properties	
Chemical formula	$C_{23}H_{25}ClN_2$ (chloride)
Molar mass	364.911 g/mol (chloride)

Pharmacology	
ATCvet code	QP53AX16 (WHO)

Hazards	
Main hazards	Moderately toxic, Extreme irritant

EU classification (DSD) T Xi

Lethal dose or concentration (LD, LC):

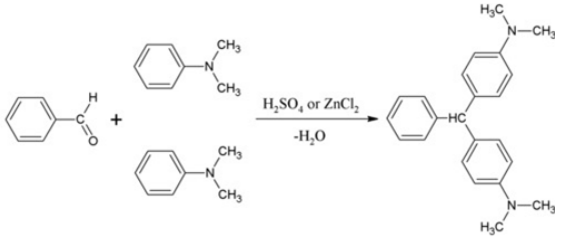
LD_{50} (median dose)
80mg/kg (oral, mouse)

Except where otherwise noted, data are given for materials in their standard state (at 25 °C [77 °F], 100 kPa).

verify (what is ?)
Infobox references

Malachite green is classified in the dyestuff industry as a triarylmethane dye and also using in pigment industry. Formally, malachite green refers to the chloride salt [C6H5C(C6H4N(CH3)2)2]Cl, although the term malachite green is used loosely and often just refers to the colored cation. The oxalate salt is also marketed. The anions have no effect on the color. The intense green color of the cation results from a strong absorption band at 621 nm (extinction coefficient of 105 M−1 cm−1).

Malachite green (second transition)
(pH indicator)
below pH 11.5 above pH 13.2
11.5 ⇌ 13.2
Malachite green (first transition)
(pH indicator)
below pH 0.2 above pH 1.8
0.2 ⇌ 1.8



Niche uses
A preparation of Bacillus subtilis showing endospores stained with malachite green (vegetative cells are stained red)
).

Toxicity

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