

insulin.

If a patient using a CGM is to be prescribed hydroxyurea, consult with the CGM prescriber about alternative glucose monitoring methods.

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Risk Summary

Hydroxyurea capsules can cause fetal harm based on findings from animal studies and the drug's mechanism of action [see *Clinical Pharmacology* (12.1)]. There are no data with hydroxyurea capsules use in pregnant women to inform a drug-associated risk. In animal reproduction studies, administration of hydroxyurea to pregnant rats and rabbits during organogenesis produced embryotoxic and teratogenic effects at doses 0.8 times and 0.3 times, respectively, the maximum recommended human daily dose on a mg/m² basis (see *Data*). Advise women of the potential risk to a fetus and to avoid becoming pregnant while being treated with hydroxyurea capsules. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2%–4% and 15%–20%, respectively.

Data

Animal Data

Hydroxyurea has been demonstrated to be a potent teratogen in a wide variety of animal models, including mice, hamsters, cats, miniature swine, dogs, and monkeys at doses within 1-fold of the human dose given on a mg/m² basis. Hydroxyurea is embryotoxic and causes fetal malformations (partially ossified cranial bones, absence of eye sockets, hydrocephaly, bipartite sternbrae, missing lumbar vertebrae) at 180 mg/kg/day (about 0.8 times the maximum recommended human daily dose on a mg/m² basis) in rats and at 30 mg/kg/day (about 0.3 times the maximum recommended human daily dose on a mg/m² basis) in rabbits. Embryotoxicity was characterized by decreased fetal viability, reduced live litter sizes, and developmental delays. Hydroxyurea crosses the placenta. Single doses of ≥375 mg/kg (about 1.7 times the maximum recommended human daily dose on a mg/m² basis) to rats caused growth retardation and impaired learning ability.

8.2 Lactation

Risk Summary

Hydroxyurea is excreted in human milk. Because of the potential for serious adverse reactions in a breastfed infant from hydroxyurea, including carcinogenicity, discontinue breastfeeding during treatment with hydroxyurea capsules.

8.3 Females and Males of Reproductive Potential

Pregnancy Testing

Verify the pregnancy status of females of reproductive potential prior to initiating hydroxyurea therapy.

Contraception

Females

Hydroxyurea capsules can cause fetal harm when administered to a pregnant woman [see *Use in Specific Populations* (8.1)]. Advise females of reproductive potential to use effective contraception during and after treatment with hydroxyurea capsules for at least 6 months after therapy. Advise females to immediately report pregnancy.

Males

Hydroxyurea may damage spermatozoa and testicular tissue, resulting in possible genetic abnormalities. Males with female sexual partners of reproductive potential should use effective contraception during and after treatment with hydroxyurea capsules for at least 1 year after therapy [see *Nonclinical Toxicology* (13.1)].

Infertility

Males

Based on findings in animals and humans, male fertility may be compromised by treatment with hydroxyurea capsules. Azospermia or oligospermia, sometimes reversible, has been observed in men. Inform male patients about the possibility of sperm conservation before the start of therapy [see *Adverse Reactions* (6) and *Nonclinical Toxicology* (13.1)].

8.4 Pediatric Use

Safety and effectiveness in pediatric patients have not been established.

8.5 Geriatric Use

Elderly patients may be more sensitive to the effects of hydroxyurea and may require a lower dose regimen. Hydroxyurea is excreted by the kidney, and the risk of adverse reactions to this drug may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should be taken in dose selection, and it may be useful to monitor renal function [see *Dosage and Administration* (2.3)].

8.6 Renal Impairment

The exposure to hydroxyurea is higher in patients with creatinine clearance of less than 60 mL/min or in patients with end-stage renal disease (ESRD). Reduce dosage and closely monitor the hematologic parameters when hydroxyurea capsule is to be administered to these patients [see *Dosage and Administration* (2.3) and *Clinical Pharmacology* (12.3)].

8.7 Hepatic Impairment

There are no data that support specific guidance for dosage adjustment in patients with hepatic impairment. Close monitoring of hematologic parameters is advised in these patients.

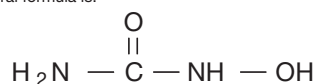
10 OVERDOSAGE

Acute mucocutaneous toxicity has been reported in patients receiving hydroxyurea at dosages several times the therapeutic dose. Soreness, violet erythema, edema on palms and soles followed by scaling of hands and feet, severe generalized hyperpigmentation of the skin, and stomatitis have also been observed.

11 DESCRIPTION

Hydroxyurea capsules, USP are an antimetabolite available for oral use as capsules containing 500 mg hydroxyurea, USP. Inactive ingredients include colloidal silicon dioxide, FD&C Blue No. 1, FD&C Red No. 3, gelatin, magnesium stearate, titanium dioxide and black ink. The black ink contains black iron oxide, dewaxed shellac and potassium hydroxide.

Hydroxyurea is a white to off-white crystalline powder. It is non-hygroscopic and freely soluble in water, but practically insoluble in alcohol. The empirical formula is CH₄N₂O₂ and it has a molecular weight of 76.05. Its structural formula is:



Meets USP dissolution test 2.

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action

The precise mechanism by which hydroxyurea produces its antineoplastic effects cannot, at present, be described. However, the reports of various studies in tissue culture in rats and humans lend support to the hypothesis that hydroxyurea causes an immediate inhibition of DNA synthesis by acting as a ribonucleotide reductase inhibitor, without interfering with the synthesis of ribonucleic acid or of protein. This hypothesis explains why, under certain conditions, hydroxyurea may induce teratogenic effects.

Three mechanisms of action have been postulated for the increased effectiveness of concomitant use of hydroxyurea therapy with irradiation on squamous cell (epidermoid) carcinomas of the head and neck. *In vitro* studies utilizing Chinese hamster cells suggest that hydroxyurea (1) is lethal to normally radioresistant S-stage cells, and (2) holds other cells of the cell cycle in the G1 or pre-DNA synthesis stage where they are most susceptible to the effects of irradiation. The third mechanism of action has been theorized on the basis of *in vitro* studies of HeLa cells. It appears that hydroxyurea, by inhibition of DNA synthesis, hinders the normal repair process of cells damaged but not killed by irradiation, thereby decreasing their survival rate; RNA and protein syntheses have shown no alteration.

12.3 Pharmacokinetics

Absorption

Following oral administration of hydroxyurea capsules, hydroxyurea reaches peak plasma concentrations in 1 to 4 hours. Mean peak plasma concentrations and AUCs increase more than proportionally with increase of dose.

There are no data on the effect of food on the absorption of hydroxyurea.

Distribution

Hydroxyurea distributes throughout the body with a volume of distribution approximating total body water.

Hydroxyurea concentrates in leukocytes and erythrocytes.

Metabolism

Up to 60% of an oral dose undergoes conversion through saturable hepatic metabolism and a minor pathway of degradation by urease found in intestinal bacteria.

Excretion

In patients with sickle cell anemia, the mean cumulative urinary recovery of hydroxyurea was about 40% of the administered dose.

Specific Populations

Renal Impairment

The effect of renal impairment on the pharmacokinetics of hydroxyurea was assessed in adult patients with sickle cell disease and renal impairment. Patients with normal renal function (creatinine clearance [CrCl] >80 mL/min), mild (CrCl 50–80 mL/min), moderate (CrCl = 30–<50 mL/min), or severe (<30 mL/min) renal impairment received a single oral dose of 15 mg/kg hydroxyurea. Patients with ESRD received two doses of 15 mg/kg separated by 7 days; the first was given following a 4-hour hemodialysis session, the second prior to hemodialysis. The exposure to hydroxyurea (mean AUC) in patients with CrCl <60 mL/min and those with ESRD was 64% higher than in patients with normal renal function (CrCl >60 mL/min). Reduce the dose of hydroxyurea capsules when it is administered to patients with creatinine clearance of <60 mL/min or with ESRD following hemodialysis [see *Dosage and Administration* (2.3) and *Use in Specific Populations* (8.6)].

13 NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

Conventional long-term studies to evaluate the carcinogenic potential of hydroxyurea have not been performed. However, intraperitoneal administration of 125 to 250 mg/kg hydroxyurea (about 0.6–1.2 times the maximum recommended human oral daily dose on a mg/m² basis) thrice weekly for 6 months to female rats increased the incidence of mammary tumors in rats surviving to 18 months compared to control. Hydroxyurea is mutagenic *in vitro* to bacteria, fungi, protozoa, and mammalian cells. Hydroxyurea is clastogenic *in vitro* (hamster cells, human lymphoblasts) and *in vivo* (SCE assay in rodents, mouse micronucleus assay). Hydroxyurea causes the transformation of rodent embryo cells to a tumorigenic phenotype. Hydroxyurea administered to male rats at 60 mg/kg/day (about 0.3 times the maximum recommended human daily dose on a mg/m² basis) produced testicular atrophy, decreased spermatogenesis, and significantly reduced their ability to impregnate females.

15 REFERENCES

OSHA. <http://www.osha.gov/SLTC/hazardousdrugs/index.html>.

16 HOW SUPPLIED/STORAGE AND HANDLING

16.1 How Supplied

Hydroxyurea capsules, USP are supplied as 500 mg capsules in HDPE bottles with a child resistant cap. Each bottle contains 100 capsules. The cap is opaque powder blue and the body is opaque pink. The capsules are imprinted with "83" on the body in black ink (NDC 70069-820-01).

16.2 Storage

Store at 20°C to 25°C (68°F to 77°F); excursions permitted to 15°C to 30°C (59°F to 86°F) [see USP Controlled Room Temperature]. Keep tightly closed.

16.3 Handling and Disposal

Hydroxyurea capsules are a cytotoxic drug. Follow applicable special handling and disposal procedures [see *References* (15)].

To decrease the risk of contact, advise caregivers to wear disposable gloves when handling hydroxyurea capsules or bottles containing hydroxyurea capsules. Wash hands with soap and water before and after contact with the bottle or capsules when handling hydroxyurea capsules. Do not open hydroxyurea capsules. Avoid exposure to crushed or opened capsules. If contact with crushed or opened capsules occurs on the skin, wash affected area immediately and thoroughly with soap and water. If contact with crushed or opened capsules occurs on the eye(s), the affected area should be flushed thoroughly with water or isotonic eyewash designated for that purpose for at least 15 minutes. If the powder from the capsule is spilled, immediately wipe it up with a damp disposable towel and discard in a closed container, such as a plastic bag; as should the empty capsules. The spill areas should then be cleaned three times using a detergent solution followed by clean water. Keep the medication away from children and pets. Contact your doctor for instructions on how to dispose of outdated capsules.

17 PATIENT COUNSELING INFORMATION

- There is a risk of myelosuppression. Monitoring blood counts weekly throughout the duration of therapy should be emphasized to patients taking hydroxyurea capsules. Advise patients to report signs and symptoms of infection or bleeding immediately [see *Warnings and Precautions* (5.1)].
- Advise patients of the risk of hemolytic anemia. Advise patients that they will have blood tests to evaluate for this if they develop persistent anemia [see *Warnings and Precautions* (5.2)].
- Advise patients that there is a risk of cutaneous vasculitic toxicities and secondary malignancies including leukemia and skin cancers [see *Warnings and Precautions* (5.3, 5.5)].
- Advise females of reproductive potential of the potential risk to a fetus and to inform their healthcare provider of a known or suspected pregnancy. Advise females and males of reproductive potential to use contraception during and after treatment with hydroxyurea capsules [see *Warnings and Precautions* (5.4) and *Use in Specific Populations* (8.1, 8.3)].
- Advise patients to inform their healthcare provider if they have received or are planning to receive vaccinations while taking hydroxyurea capsules as this may result in a severe infection [see *Warnings and Precautions* (5.6)].
- Advise females to discontinue breastfeeding during treatment with hydroxyurea capsules [see *Use in Specific Populations* (8.2)].
- Patients with HIV infection should contact their physician for signs and symptoms of pancreatitis, hepatic events, and peripheral neuropathy [see *Warnings and Precautions* (5.7)].
- Post-irradiation erythema can occur in patients who have received previous irradiation therapy [see *Warnings and Precautions* (5.8)].
- Advise patients of the symptoms of potential pulmonary toxicity and instruct them to seek prompt medical attention in the event of pyrexia, cough, dyspnea, or other respiratory symptoms [see *Warnings and Precautions* (5.10)].
- Advise patients to notify their healthcare provider if they are using a continuous glucose monitoring system while taking hydroxyurea capsules [see *Warnings and Precautions* (5.11)].

Manufactured by:

Qilu Pharmaceutical Co., Ltd.

Jinan, 250104, China

Manufactured for:

Somerset Therapeutics LLC

300 Franklin Square Drive, Somerset, NJ 08873, USA

Code number: 34040140411A