

SUMMARY OF PRODUCT CHARACTERISTICS

1. Name of the medicinal product

HERPIVAL-500 (Valacyclovir Hydrochloride Tablets USP 500 mg)

2. Qualitative and quantitative

composition Each film coated tablet
contains: Valacyclovir Hydrochloride
USP equivalent to Valacyclovir.....
500mg
Colour: Titanium Dioxide BP
For full list of excipients see section 6.1

3. Pharmaceutical form

Tablet (film coated) – Solid dosage form

4. Clinical particulars

4.1 Therapeutic indications

Varicella zoster virus (VZV) infections – herpes zoster

Valacyclovir is indicated for the treatment of herpes zoster (shingles) and ophthalmic zoster in immunocompetent adults.

Valacyclovir is indicated for the treatment of herpes zoster in adult patients with mild or moderate immunosuppression. Herpes simplex virus (HSV) infections

Valacyclovir is indicated

- for the treatment and suppression of HSV infections of the skin and mucous membranes including
 - treatment of first-episode of genital herpes in immunocompetent adults and adolescents and in immunocompromised adults
 - treatment of recurrences of genital herpes in immunocompetent adults and adolescents, and in immunocompromised adults

- suppression of recurrent genital herpes in immunocompetent adults and adolescents and in immunocompromised adults
- Treatment and suppression of recurrent ocular HSV infections in immunocompetent adults and adolescents and in immunocompromised adults

Clinical studies have not been conducted in HSV-infected patients immunocompromised for other causes than HIV-infection. Cytomegalovirus (CMV) infections:

Valacyclovir is indicated for the prophylaxis of CMV infection and disease following solid organ transplantation in adults and adolescents

4.2 Posology and method of

administration Method of administration

Oral use.

The tablet should be swallowed with a sufficient amount of fluid (e.g. one glass of water).

The tablet can be taken with or without food.

Varicella zoster virus (VZV) infections – herpes zoster and ophthalmic zoster

Patients should be advised to start treatment as soon as possible after a diagnosis of herpes zoster.

There are no data on treatment started more than 72 hours after onset of the zoster rash.

Immunocompetent Adults

The dose in immunocompetent patients is 1000 mg three times daily for seven days (3000 mg total daily dose). This dose should be reduced according to creatinine clearance (see renal impairment below). *Immunocompromised Adults*

The dose in immunocompromised patients is 1000 mg three times daily for at least seven days (3000 mg total daily dose) and for 2 days following crusting of lesions. This dose should be reduced according to creatinine clearance (see renal impairment below).

In immunocompromised patients, antiviral treatment is suggested for patients presenting within one week of vesicle formation or at any time before full crusting of lesions.

Treatment of herpes simplex virus (HSV) infections in adults and adolescents (≥ 12 years)

Immunocompetent Adults and Adolescents (≥ 12 years)

The dose is 500 mg of Valacyclovir to be taken twice daily (1000 mg total daily dose). This dose should be reduced according to creatinine clearance (see renal impairment below).

For recurrent episodes, treatment should be for three to five days. For initial episodes, which can be more severe, treatment may have to be extended to ten days. Dosing should begin as early as possible.

For recurrent episodes of herpes simplex, this should ideally be during the prodromal period or immediately upon appearance of the first signs or symptoms. Valacyclovir can prevent lesion development when taken at the first signs and symptoms of an HSV recurrence.

Herpes labialis

For herpes labialis (cold sores), Valacyclovir 2000 mg twice daily for one day is effective treatment in adults and adolescents. The second dose should be taken about 12 h (no sooner than 6 h) after the first dose. This dose should be reduced according to creatinine clearance (see Renal impairment below). When using this dosing regimen, treatment should not exceed one day, since this has been shown not to provide additional clinical benefit. Therapy should be initiated at the earliest symptom of a cold sore (e.g. tingling, itching or burning).

Immunocompromised Adults

For the treatment of HSV in immunocompromised adults, the dosage is 1000 mg twice daily for at least 5 days, following assessment of the severity of the clinical condition and immunological status of the patient. For initial episodes, which can be more severe, treatment may have to be extended to ten days. Dosing should begin as early as possible. This dose should be reduced according to creatinine clearance (see Renal impairment below). For maximum

clinical benefit, the treatment should be started within 48 hours. A strict monitoring of the evolution of lesions is advised.

Suppression of recurrences of herpes simplex virus (HSV) infections in adults and

adolescents (≥ 12 years)

Immunocompetent Adults and Adolescents (≥ 12 years)

The dose is 500 mg of Valacyclovir to be taken once daily. Some patients with very frequent recurrences (≥ 10 /year in absence of therapy) may gain additional benefit from the daily dose of 500 mg being taken as a divided dose (250 mg twice daily). This dose should be reduced according to creatinine clearance (see Renal impairment below). Treatment should be reevaluated after 6 to 12 months of therapy.

Immunocompromised Adults

The dose is 500 mg of Valacyclovir twice daily. This dose should be reduced according to creatinine clearance (see Renal impairment below). Treatment should be re-evaluated after 6 to 12 months of therapy.

Prophylaxis of cytomegalovirus (CMV) infection and disease in adults and adolescents (≥ 12 years)

The dosage of Valacyclovir is 2000 mg four times a day, to be initiated as early as possible post-transplant.

This dose should be reduced according to creatinine clearance (see Renal impairment below). The duration of treatment will usually be 90 days, but may need to be extended in high-risk patients.

Special populations Children

The efficacy of Valacyclovir in children below the age of 12 years has not been evaluated.

Elderly

The possibility of renal impairment in the elderly must be considered and the dose should be adjusted accordingly (see Renal impairment below). Adequate hydration should be maintained.

Renal impairment

Caution is advised when administering Valacyclovir to patients with impaired renal function. Adequate hydration should be maintained. The dose of Valacyclovir should be reduced in patients with impaired renal function as shown in Table 1 below.

In patients on intermittent haemodialysis, the Valacyclovir dose should be administered after the haemodialysis has been performed. The creatinine clearance should be monitored frequently, especially during periods when renal function is changing rapidly e.g. immediately after renal transplantation or engraftment. The Valacyclovir dosage should be adjusted accordingly.

Hepatic impairment

Studies with a 1000 mg dose of Valacyclovir in adult patients show that dose modification is not required in patients with mild or moderate cirrhosis (hepatic synthetic function maintained). Pharmacokinetic data in adult patients with advanced cirrhosis (impaired hepatic synthetic function and evidence of portal-systemic shunting) do not indicate the need for dose adjustment; however, clinical experience is limited. For higher doses (4000 mg or more per day).

Table 1: DOSAGE ADJUSTMENT FOR RENAL IMPAIRMENT

Therapeutic Indication	Creatinine Clearance (mL/min)	Valacyclovir Dosage ^a
Varicella-Zoster Virus (VZV) Infections		
<i>Treatment of herpes zoster (shingles)</i> in immunocompetent and immunocompromised adults	≥ 50	1000 mg three times daily
	30 to 49	1000 mg twice daily
	10 to 29	1000 mg once daily
	<10	500 mg once daily
Herpes Simplex Virus (HSV) Infections		
Treatment of HSV infections		
- immunocompetent adults and adolescents	≥ 30	500 mg twice daily
	< 30	500 mg once daily

- immunocompromised adults	≥ 30 < 30	1000 mg twice daily 1000 mg once daily
<i>Treatment of herpes labialis (cold sores) in immunocompetent adults and adolescents (alternative 1-day regimen)</i>	≥50 30 to 49 10 to 29 <10	2000mg twice in one day 1000 mg twice in one day 500 mg twice in one day 500 mg single dose
<i>Suppression of HSV infections</i>		
- immunocompetent adults and adolescents	≥ 30 < 30	500 mg once daily b 250 mg once daily
- immunocompromised adults	≥ 30 < 30	500 mg twice daily 500 mg once daily
Cytomegalovirus (CMV) Infections		
<i>CMV prophylaxis in solid organ transplant recipients in adults and adolescents</i>	≥75 50 to <75 25 to <50	2000 mg four times daily 1500 mg four times daily 1500 mg three times daily
	10 to <25 dialysis	1500 mg twice daily <10 or on 1500 mg once daily

^a For patients on intermittent haemodialysis, the dose should be given after dialysis on dialysis days.

^b For HSV suppression in immunocompetent subjects with a history of ≥10 = recurrences/year, better results may be obtained with 250 mg twice daily.

4.3 Contraindications

Hypersensitivity to Valacyclovir or acyclovir or any of the excipients.

4.4 Special warnings and precautions for use

Hydration status

Care should be taken to ensure adequate fluid intake in patients who are at risk of dehydration, particularly the elderly.

Use in patients with renal impairment and in elderly patients

Acyclovir is eliminated by renal clearance; therefore, the dose of Valacyclovir must be reduced in patients with renal impairment. Elderly patients are likely to have reduced renal function and therefore the need for dose reduction must be considered in this group of patients. Both elderly patients and patients with renal impairment are at increased risk of developing neurological side-effects and should be closely monitored for evidence of these effects. In the reported cases, these reactions were generally reversible on discontinuation of treatment.

Use of higher doses of Valacyclovir in hepatic impairment and liver transplantation

There are no data available on the use of higher doses of Valacyclovir (4000 mg or more per day) in patients with liver disease. Specific studies of Valacyclovir have not been conducted in liver transplantation, and hence caution should be exercised when administering daily doses greater than 4000 mg to these patients.

Use for zoster treatment

Clinical response should be closely monitored, particularly in immunocompromised patients. Consideration should be given to intravenous antiviral therapy when response to oral therapy is considered insufficient.

Patients with complicated herpes zoster, i.e. those with visceral involvement, disseminated zoster, motor neuropathies, encephalitis and cerebrovascular complications should be treated with intravenous antiviral therapy.

Moreover, immunocompromised patients with ophthalmic zoster or those with a high risk for disease dissemination and visceral organ involvement should be treated with intravenous antiviral therapy.

Transmission of genital herpes

Patients should be advised to avoid intercourse when symptoms are present even if treatment with an antiviral has been initiated. During suppressive

treatment with antiviral agents, the frequency of viral shedding is significantly reduced. However, the risk of transmission is still possible. Therefore, in addition to therapy with Valacyclovir, it is recommended that patients use safer sex practices. Use in ocular HSV infections

Clinical response should be closely monitored in these patients. Consideration should be given to intravenous antiviral therapy when response to oral therapy is unlikely to be sufficient.

Use in CMV infections

Data on the efficacy of Valacyclovir from transplant patients (~200) at high risk of CMV disease (e.g. donor CMV-positive/recipient CMV negative or use of anti-thymocyte globulin induction therapy) indicate that Valacyclovir should only be used in these patients when safety concerns preclude the use of valganciclovir or ganciclovir.

High dose Valacyclovir as required for CMV prophylaxis may result in more frequent adverse events, including CNS abnormalities, than observed with lower doses administered for other indications. Patients should be closely monitored for changes in renal function, and doses adjusted accordingly.

Drug reaction with eosinophilia and systemic symptoms (DRESS):

DRESS, which can be life-threatening or fatal, has been reported in association with Valacyclovir treatment. At the time of prescription patients should be advised of the signs and symptoms and monitored closely for skin reactions. If signs and symptoms suggestive of DRESS appear, Valacyclovir should be withdrawn immediately and an alternative treatment considered (as appropriate). If the patient has developed DRESS with the use of Valacyclovir, treatment with Valacyclovir must not be restarted in this patient at any time.

4.5 Interaction with other medicinal products and other forms of interaction The combination of Valacyclovir with nephrotoxic medicinal products should be made with caution, especially in subjects with impaired renal function, and warrants regular monitoring of renal function. This applies to concomitant administration with aminoglycosides, organoplatinum

compounds, iodinated contrast media, methotrexate, pentamidine, foscarnet, ciclosporin, and tacrolimus.

Acyclovir is eliminated primarily unchanged in the urine via active renal tubular secretion. Following 1000 mg Valacyclovir, cimetidine and probenecid reduce acyclovir renal clearance and increase the AUC of acyclovir by about 25% and 45%, respectively, by inhibition of the active renal secretion of acyclovir. Cimetidine and probenecid taken together with Valacyclovir increased acyclovir AUC by about 65%. Other medicinal products (including e.g. tenofovir) administered concurrently that compete with or inhibit active tubular secretion may increase acyclovir concentrations by this mechanism. Similarly, Valacyclovir administration may increase plasma concentrations of the concurrently administered substance.

In patients receiving higher acyclovir exposures from Valacyclovir (e.g., at doses for zoster treatment or CMV prophylaxis), caution is required during concurrent administration with drugs which inhibit active renal tubular secretion.

Increases in plasma AUCs of acyclovir and of the inactive metabolite of mycophenolate mofetil, an immunosuppressant agent used in transplant patients, have been shown when the drugs are co-administered. No changes in peak concentrations or AUCs are observed with coadministration of Valacyclovir and mycophenolate mofetil in healthy volunteers. There is limited clinical experience with the use of this combination.

4.6 Fertility, Pregnancy and Lactation

Pregnancy

A limited amount of data on the use of Valacyclovir and a moderate amount of data on the use of acyclovir in pregnancy is available from pregnancy registries (which have documented the pregnancy outcomes in women exposed to Valacyclovir or to oral or intravenous acyclovir (the active metabolite of Valacyclovir); 111 and 1246 outcomes (29 and 756 exposed during the first trimester of pregnancy, respectively) and post marketing

experience indicate no malformative or foeto/neonatal toxicity. Animal studies do not show reproductive toxicity for Valacyclovir. Valacyclovir should only be used in pregnancy if the potential benefits of treatment outweigh the potential risk.

Breastfeeding

Acyclovir, the principal metabolite of Valacyclovir, is excreted in breast milk. However, at therapeutic doses of Valacyclovir, no effects on the breastfed newborns/infants are anticipated since the dose ingested by the child is less than 2% of the therapeutic dose of intravenous acyclovir for treatment of neonatal herpes. Valacyclovir should be used with caution during breast feeding and only when clinically indicated.

Fertility

Valacyclovir did not affect fertility in rats dosed by the oral route. At high parenteral doses of acyclovir testicular atrophy and aspermatogenesis have been observed in rats and dogs. No human fertility studies were performed with Valacyclovir, but no changes in sperm count, motility or morphology were reported in 20 patients after 6 months of daily treatment with 400 to 1000 mg acyclovir.

4.7 Effects on ability to drive and use machines

No studies on the effects on the ability to drive and use machines have been performed. The clinical status of the patient and the adverse reaction profile of Valacyclovir should be borne in mind when considering the patient's ability to drive or operate machinery. Further, a detrimental effect on such activities cannot be predicted from the pharmacology of the active substance.

4.8 Undesirable effects

The most common adverse reactions (ARs) reported in at least one indication by patients treated with Valtrex in clinical trials were headache and nausea. More serious ARs such as thrombotic thrombocytopenic purpura/haemolytic

uraemic syndrome, acute renal failure, neurological disorders and DRESS are discussed in greater detail in other sections of the label.

Undesirable effects are listed below by body system organ class and by frequency.

The following frequency categories are used for classification of adverse effects:	
Very common	$\geq 1/10$,
Common	$\geq 1/100$ to $< 1/10$,
Uncommon	$\geq 1/1,000$ to $< 1/100$,
Rare	$\geq 1/10,000$ to $< 1/1000$,
Very rare Not known	$< 1/10,000$ (Cannot be estimated from the available data)

Clinical trial data have been used to assign frequency categories to ARs if, in the trials, there was evidence of an association with valacyclovir.

For ARs identified from post marketing experience, but not observed in clinical trials, the most conservative value of point estimate (“rule of three”) has been used to assign the AR frequency category. For ARs identified as associated with valacyclovir from post-marketing experience, and observed in clinical trials, study incidence has been used to assign the AR frequency category. The clinical trial safety database is based on 5855 subjects exposed to valacyclovir in clinical trials covering multiple indications (treatment of herpes zoster, treatment/suppression of genital herpes & treatment of cold sores).

Clinical Trial Data

<u>Nervous system disorders</u>	
Very common:	Headache
<u>Gastrointestinal disorders</u>	
Common:	Nausea

Post Marketing Data

<u>Blood and lymphatic system disorders</u>	
Uncommon:	Leucopenia, thrombocytopenia
Leucopenia is mainly reported in immunocompromised patients.	
<u>Immune system disorders</u>	
Rare:	Anaphylaxis

<u>Psychiatric and nervous system disorders</u>	
Common:	Dizziness
Uncommon:	Confusion, hallucinations, decreased consciousness, tremor, agitation
Rare:	Ataxia, dysarthria, convulsions, encephalopathy, coma, psychotic symptoms, delirium.
Neurological disorders, sometimes severe, may be linked to encephalopathy and include confusion, agitation, convulsions, hallucinations, coma. These events are generally reversible and usually seen in patients with renal impairment or with other predisposing factors. In organ transplant patients receiving high doses (8000 mg daily) of Valtrex for CMV prophylaxis, neurological reactions occurred more frequently compared with lower doses	
used for other indications.	
<u>Respiratory, thoracic and mediastinal disorders</u>	
Uncommon:	Dyspnoea
<u>Gastrointestinal disorders</u>	
Common:	Vomiting, diarrhoea
Uncommon:	Abdominal discomfort
<u>Hepato-biliary disorders</u>	
Uncommon:	Reversible increases in liver function tests (e.g. bilirubin, liver enzymes).
<u>Skin and subcutaneous tissue disorders</u>	
Common:	Rashes including photosensitivity, pruritus
Uncommon:	Urticaria
Rare:	Angioedema
Not known:	Drug reaction with eosinophilia and systemic symptoms (DRESS)
<u>Renal and urinary disorders</u>	
Uncommon:	Renal pain, haematuria (often associated with other renal events).
Rare:	Renal impairment, acute renal failure (especially in elderly patients or in patients with renal impairment receiving higher than the recommended doses).

Renal pain may be associated with renal failure.

Intratumular precipitation of acyclovir crystals in the kidney has also been reported.

Adequate fluid intake should be ensured during treatment.

Additional information on special populations

There have been reports of renal insufficiency, microangiopathic haemolytic anaemia and thrombocytopenia (sometimes in combination) in severely immunocompromised adult patients, particularly those with advanced HIV disease, receiving high doses (8000 mg daily) of valacyclovir for prolonged periods in clinical trials. These findings have also been observed in patients not treated with valacyclovir who have the same underlying or concurrent conditions.

Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions via <https://pv.pharmacyboardkenya.org>

4.9 Overdose

Symptoms and Signs

Acute renal failure and neurological symptoms, including confusion, hallucinations, agitation, decreased consciousness and coma, have been reported in patients receiving overdoses of Valacyclovir. Nausea and vomiting may also occur. Caution is required to prevent inadvertent overdosing. Many of the reported cases involved renally impaired and elderly patients receiving repeated overdoses, due to lack of appropriate dosage reduction.

Treatment

Patients should be observed closely for signs of toxicity. Haemodialysis significantly enhances the removal of acyclovir from the blood and may, therefore, be considered a management option in the event of symptomatic overdose.

5. Pharmacological properties

5.1 Pharmacodynamic properties

Antivirals for systemic use

Pharmacotherapeutic group: Nucleosides and nucleotides excluding reverse transcriptase inhibitors, ATC code: J05AB11.

Mechanism of action

Valacyclovir, an antiviral, is the L-valine ester of acyclovir. Acyclovir is a purine (guanine) nucleoside analogue.

Valacyclovir is rapidly and almost completely converted in man to acyclovir and valine, probably by the enzyme referred to as Valacyclovir hydrolase.

Acyclovir is a specific inhibitor of the herpes viruses with in vitro activity against herpes simplex viruses (HSV) type 1 and type 2, varicella zoster virus (VZV), cytomegalovirus (CMV), Epstein-Barr Virus (EBV), and human herpes virus 6 (HHV-6). Acyclovir inhibits herpes virus DNA synthesis once it has been phosphorylated to the active triphosphate form. The first stage of phosphorylation requires the activity of a virus-specific enzyme. In the case of HSV, VZV and EBV this enzyme is the viral thymidine kinase (TK), which is only present in virus-infected cells. Selectivity is maintained in CMV with phosphorylation, at least in part, being mediated through the phosphotransferase gene product of UL97. This requirement for activation of acyclovir by a virus specific enzyme largely explains its selectivity. The phosphorylation process is completed (conversion from mono- to triphosphate) by cellular kinases. Acyclovir triphosphate competitively inhibits the virus DNA polymerase and incorporation of this nucleoside analogue results in obligate chain termination, halting virus DNA synthesis and thus blocking virus replication.

Pharmacodynamic effects

Resistance to acyclovir is normally due to a thymidine kinase deficient phenotype which results in a virus which is disadvantaged in the natural host. Reduced sensitivity to acyclovir has been described as a result of subtle alterations in either the virus thymidine kinase or DNA polymerase. The virulence of these variants resembles that of the wild-type virus. Monitoring of clinical HSV and VZV isolates from patients receiving acyclovir therapy or prophylaxis has revealed that virus with reduced sensitivity to acyclovir is extremely rare in the immunocompetent host and is found infrequently in severely immunocompromised individuals e.g. organ or bone marrow

transplant recipients, patients receiving chemotherapy for malignant disease and people infected with the human immunodeficiency virus (HIV).

Clinical studies

Varicella Zoster Virus Infection

Valacyclovir accelerates the resolution of pain: it reduces the duration of and the proportion of patients with zoster-associated pain, which includes acute and, in patients older than 50 years, also post-herpetic neuralgia. Valacyclovir reduces the risk of ocular complications of ophthalmic zoster.

Intravenous therapy generally is considered standard for zoster treatment in immunocompromised patients; however, limited data indicate a clinical benefit of Valacyclovir in the treatment of VZV infection (herpes zoster) in certain immunocompromised patients, including those with solid organ cancer, HIV, autoimmune diseases, lymphoma, leukaemia and stem cell transplants.

Herpes Simplex Virus Infection

Valacyclovir for ocular HSV infections should be given according to applicable treatment guidelines.

Studies of Valacyclovir treatment and suppression for genital herpes were performed in HIV/HSV coinfecting patients with a median CD4 count of > 100 cells/mm³. Valacyclovir 500 mg twice daily was superior to 1000 mg once daily for suppression of symptomatic recurrences. Valacyclovir 1000 mg twice daily for treatment of recurrences was comparable to oral acyclovir 200 mg five times daily on herpes episode duration. Valacyclovir has not been studied in patients with severe immune deficiency.

The efficacy of Valacyclovir for the treatment of other HSV skin infections has been documented. Valacyclovir has shown efficacy in the treatment of herpes labialis (cold sores), mucositis due to chemotherapy or radiotherapy, HSV reactivation from facial resurfacing, and herpes gladiatorum. Based on historical acyclovir experience, Valacyclovir appears to be as effective as acyclovir for the treatment of erythema multiforme, eczema herpeticum and herpetic whitlow.

Valacyclovir has been proven to reduce the risk of transmission of genital herpes in immunocompetent adults when taken as suppressive therapy and combined with safer sex practices. A double blind, placebo-controlled study was conducted in 1,484 heterosexual, immunocompetent adult couples discordant for HSV-2 infection. Results showed significant reductions in risk of transmission: 75 % (symptomatic HSV-2 acquisition), 50 % (HSV-2 seroconversion), and 48 % (overall HSV-2 acquisition) for Valacyclovir compared to placebo. Among subjects participating in a viral shedding sub-study, Valacyclovir significantly reduced shedding by 73 % compared to placebo (see section 4.4 for additional information on transmission reduction).

Cytomegalovirus Infection

CMV prophylaxis with Valacyclovir in subjects receiving solid organ transplantation (kidney, heart) reduces the occurrence of acute graft rejection, opportunistic infections and other herpes virus infections (HSV, VZV). There is no direct comparative study versus valganciclovir to define the optimal therapeutic management of solid organ transplant patients.

5.2 Pharmacokinetic properties

Absorption

Valacyclovir is a prodrug of acyclovir. The bioavailability of acyclovir from Valacyclovir is about 3.3 to 5.5-fold greater than that historically observed for oral acyclovir. After oral administration Valacyclovir is well absorbed and rapidly and almost completely converted to acyclovir and valine. This conversion is probably mediated by an enzyme isolated from human liver referred to as Valacyclovir hydrolase. The bioavailability of acyclovir from 1000 mg Valacyclovir is 54%, and is not reduced by food. Valacyclovir pharmacokinetics is not dose-proportional. The rate and extent of absorption decreases with increasing dose, resulting in a less than proportional increase in C_{max} over the therapeutic dose range and a reduced bioavailability at doses above 500 mg. Acyclovir pharmacokinetic (PK) parameter estimates following single doses of 250 to 2000 mg Valacyclovir to healthy subjects with normal renal function are shown below.

Acyclovir PK Parameter	250 mg	500 mg	1000 mg	2000 mg
	(N=15)	(N=15)	(N=15)	(N=8)
C _{max} micrograms/mL	2.20 ± 0.38	3.37 ± 0.95	5.20 ± 1.92	8.30 ± 1.43

Tmax	hours (h)	0.75 (0.75–1.5)	1.0 (0.75–2.5)	2.0 (0.75–3.0)	2.0 (1.5–3.0)
AUC	h.micrograms/ mL	5.50 ± 0.82	11.1 ± 1.75	18.9 ± 4.51	29.5 ± 6.36

Cmax = peak concentration; Tmax = time to peak concentration; AUC = area under the concentration time curve. Values for Cmax and AUC denote mean ± standard deviation. Values for Tmax denote median and range.

Peak plasma concentrations of unchanged Valacyclovir are only about 4% of peak acyclovir levels, occur at a median time of 30 to 100 min post-dose, and are at or below the limit of quantification 3 h after dosing. The Valacyclovir and acyclovir pharmacokinetic profiles are similar after single and repeat dosing. Herpes zoster, herpes simplex and HIV infection do not significantly alter the pharmacokinetics of Valacyclovir and acyclovir after oral administration of Valacyclovir compared with healthy adults. In transplant recipients receiving Valacyclovir 2000 mg 4 times daily, acyclovir peak concentrations are similar to or greater than those in healthy volunteers receiving the same dose. The estimated daily AUCs are appreciably greater.

Distribution

Binding of Valacyclovir to plasma proteins is very low (15%). CSF penetration, determined by CSF/plasma AUC ratio, is independent of renal function and was about 25% for acyclovir and the metabolite 8-OH-ACV, and about 2.5% for the metabolite CMMG.

Biotransformation

After oral administration, Valacyclovir is converted to acyclovir and L-valine by first-pass intestinal and/or hepatic metabolism. Acyclovir is converted to a small extent to the metabolites 9(carboxy-methoxy)-methylguanine (CMMG) by alcohol and aldehyde dehydrogenase and to 8-hydroxy-acyclovir (8-OH-ACV) by aldehyde oxidase. Approximately 88% of the total combined plasma exposure is attributable to acyclovir, 11% to CMMG and 1% to 8-OH-ACV. Neither Valacyclovir nor acyclovir is metabolized by cytochrome P450 enzymes.

Elimination

Valacyclovir is eliminated in the urine principally as acyclovir (greater than 80% of the recovered dose) and the acyclovir metabolite CMMG (about 14% of the recovered dose). The metabolite 8-OH-ACV is detected only in small amounts in urine (< 2% of the recovered dose). Less than 1% of the administered dose of Valacyclovir is recovered in the urine as unchanged drug. In patients with normal renal function the plasma elimination half-life of acyclovir after both single and multiple dosing with Valacyclovir is approximately 3 h.

Special Populations

Renal impairment

The elimination of acyclovir is correlated to renal function, and exposure to acyclovir will increase with increased renal impairment. In patients with end-stage renal disease, the average elimination half-life of acyclovir after Valacyclovir administration is approximately 14 hours, compared with about 3 hours for normal renal function.

Exposure to acyclovir and its metabolites CMMG and 8-OH-ACV in plasma and cerebrospinal fluid (CSF) was evaluated at steady-state after multiple-dose Valacyclovir administration in 6 subjects with normal renal function (mean creatinine clearance 111 mL/min, range 91-144 mL/min) receiving 2000 mg every 6 hours and 3 subjects with severe renal impairment (mean CLcr 26 mL/min, range 17-31 mL/min) receiving 1500 mg every 12 hours. In plasma as well as CSF, concentrations of acyclovir, CMMG and 8-OH-ACV were on average 2, 4 and 5-6 times higher, respectively, at severe renal impairment compared with normal renal function.

Hepatic impairment

Pharmacokinetic data indicate that hepatic impairment decreases the rate of conversion of Valacyclovir to acyclovir but not the extent of conversion. Acyclovir half-life is not affected.

Pregnant women

A study of the pharmacokinetics of Valacyclovir and acyclovir during late pregnancy indicates that pregnancy does not affect the pharmacokinetics of Valacyclovir.

Transfer into breast milk

Following oral administration of a 500 mg dose of Valacyclovir, peak acyclovir concentrations (C_{max}) in breast milk ranged from 0.5 to 2.3 times the corresponding maternal acyclovir serum concentrations. The median acyclovir concentration in breast milk was 2.24 micrograms/ml (9.95 micromoles/L). With a maternal Valacyclovir dosage of 500 mg twice daily, this level would expose a nursing infant to a daily oral acyclovir dosage of about 0.61 mg/kg/day. The elimination half-life of acyclovir from breast milk was similar to that for serum. Unchanged Valacyclovir was not detected in maternal serum, breast milk, or infant urine.

5.3 Preclinical safety data

Non-clinical data reveal no special hazard for humans based on conventional studies of safety pharmacology, repeated dose toxicity, genotoxicity, and carcinogenic potential. Valacyclovir did not affect fertility in male or female rats dosed by the oral route.

Valacyclovir was not teratogenic in rats or rabbits. Valacyclovir is almost completely metabolised to acyclovir. Subcutaneous administration of acyclovir in internationally accepted tests did not produce teratogenic effects in rats or rabbits. In additional studies in rats, foetal abnormalities and maternal toxicity were observed at subcutaneous doses that produced plasma acyclovir levels of 100 micrograms /mL (>10-fold higher than 2000 mg single dose Valacyclovir in humans with normal renal function).

6. Pharmaceutical particulars

6.1 List of excipients

Sr. No	Ingredients Name	Specification
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1	Ethylcellulose	BP
2	Isopropyl Alcohol	BP
3	Dichloromethane	BP
4	Povidone K30	BP
5	Microcrystalline Cellulose 101	BP
6	Sodium Starch Glycolate Type A	BP
7	Croscarmellose Sodium	BP
8	Crospovidone	BP
9	Hydrophobic colloidal anhydrous silica	BP
10	Purified Talc	BP
11	Magnesium Stearate	BP
12	Hypromellose 15cps	BP
13	Polyethylene Glycol 6000	USP
14	Titanium Dioxide	BP
15	Purified Water	BP

6.2

Incompatibilities

Not applicable.

6.3 Shelf life

24 months from date of manufacturing

6.4 Special precautions for storage

Store at a temperature not exceeding 30°C. Protect from moisture.

Keep all medicines out of reach of children.

6.5 Nature and contents of container

1 Alu-PVC blister of 3 tablets packed in a printed carton along with pack insert. (1x 3 Tablet)

6.6 Special precautions for disposal and other handling

No special requirements.

7. Marketing authorisation holder KLM

Laboratories Pvt. Ltd.

1004, Hubtown Viva, Western Express Highway,
Jogeshwari (E), Mumbai – 400060, India
At: Plot No. 381, Horizon Industrial Park,
Near Bamangam, Tal. – Karjan,
Dist - Vadodara – 391 243, Gujarat state, India.

8. Marketing authorisation number(s)

H2024/CTD9475/20477

**9. Date of first authorisation/renewal of the
authorisation**

06/11/2020

10. Date of revision of the text

31/10/2023