Hydrocortisone

HYOCORT

100 mg Powder for Injection BP
(I.M./I.V.) Corticosteroid

Formulation
Each vial contains:
Hydrocortisone, BP
(As Sodium Succinate) 100 mg

Description:
While or nearly white hygroscopic powder

Pharmacological properties

Pharmacodynamic Properties
Hydrocortisone is a glucocorticoid with anti-inflammatory properties.

Pharmacokinetic properties
Hydrocortisone is readily absorbed from the gastrointestinal tract and peak blood concentrations are attained in about an hour. It is more than 90% bound to plasma proteins.
Hydrocortisone is metabolized in the liver and most body tissues to hydrogenated and degradated forms such as tetrahydrocortisone and tetrahydrocortisol.
These are then excreted in the urine, mainly conjugated as glucuronides, together with a very small proportion of unchanged hydrocortisone.

Indications: Corticosteroid
Hydrocorticosteroid Succinate for injection is indicated for any condition in which rapid and intense corticosteroid effect is required such as:
Endocrine disorders - Primary or secondary adrenocortical insuffieciency
Collagen diseases - Systemic lupus erythematosus
Dermatological diseases - Severe erythema multiforme (Stevens-Johnson syndrome)
Allergic states- -Bronchial asthma, anaphylactic reactions
Gastro-intestinal diseases - Ulcerative colitis. Crohn's disease
Respiratory diseases - Aspiration of gastric contents
Medical emergencies - Hydrocortisone Sodium Succinate for Injection is indicated in the treatment of shock secondary to adrenocortical insufficiency or shock unresponsive to conventional therapy when adrenocortical insufficiency may be present.

Dosage and administration: Hydrocortisone Sodium Succinate for Injection is indicated in the administered by intravenous injection by intravenous infusion, or by intramascular injection the prefered method for initial emergency use being intravenous injection. Following the initial emergency period, consideration should be given to employing a longer-acting injectable preparation or an oral preparation.
Dosage usually ranges from 100 mg to 500 mg depending on the severity of the condition administered by intravenous injection over a period of one to ten minutes. This dose may be repeated at intervals of 2, 4 or 6 hours as indicated by the patient's response and clinical condition.
In general high-dose corticosteroid therapy shoukd be continued only until the patient's condition has stabilised - usally not beyond 48 to 72 hours. If hydrocortisone therapy must be continued beyond 48 to 72 hours hypernatraemia may occur, therefore it may be preferable to replace Hydrocortisone Sodium Succinate for injection with a corticosteroid such as methylprednisolone sodium succinate as little or no sodium retention occurs. Altough adverse effects associated with high dose, short-term corticoid theraphy are uncommon, peptic ulceration may occur. Prophylactic antacid theraphy may be indicated.
Patients subjected to severe stress following corticoid therapy should be observed closely for signs and symptoms of adrenocortical insufficiency.
Corticosteroid theraphy is an adjunct to, and not a repalcement for conventional therapy.
In patients with liver diseases, there may be an increased effect and reduced dosing may be considered.
Elderly patients: Hydrocortisone Sodium Succinate for injection is primarily used in acute short-term conditions. There is no information to suggest that a change in dosage is warranted in the elderly. However, treatment of elderly patients should be planned bearing in mind the more serious consequences of the common side-effects of corticosteroids in old age and close clinical supervision ir required.
Paediatric population: While the dose may be reduced for infants and children, it is governed more by the severity of the condition and response of the patients than by age or body weight but should not less than 25 mg daily.
Preparation of solutions: For intravenous or intramuscular injection prepare the solution aseptically by adding not more than 2 ml of sterile water for injections to the contents of one vial of Hydrocotisone Sodium Succinate for Injection 100 mg, shake and withdraw for use.
For intravenous infusion, first prepare the solution by adding not more than 2 ml of sterile water for injections to the vial, this solution may then be added to 100 ml - 1000 ml (but not less than 100 ml) of 5% dextrose in water (or isotonic saline solution or 5% dextrose in isotonic saline solution if patients is not on sodium restriction).

Contraindications
Contraindications: Hydrocortisone Sodium Succinate for Injection is contraindicated whre there is known hypersensitivity to the active substance or any of the excipients and in systemic funga infection unless specific anti-infective therapy is employed.
Admnistration of live or live, attenuated vaccines is contraindicated in patients receiving immunosuppressive doses of corticosteroids.

Precautions:
Particular care is required when considering the use of systemic corticosteroids in patients with the following conditions and frequent patient monitoring is necessary.
Osteoporosis (post-menopausal females are particularly at risk), Hypertension or congestive heart failure, Existing or previous history of severe affective disorders (especially previous steroid psychosis), Diabetes mellitus (or a family history of diabetes), History of tuberculosis, Glaucoma (or a family history of glaucoma), Previous corticosteroid-induced myopathy, Liver failure orcirrhosis, Renal insufficiency, Epilepsy, Peptic ulceration, Fresh intestinal, nastomoses, Predisposition to thrombophlebitis, Abscess or other pyogenic infections, Ulcerative colits, Diverticullitis, Myasthenia gravis, Ocular herpes simplex, for fear of coneal perforation, Hypothyroidism, Recent myocardial infarction (myocardial rupture has been reported).
Kaposi's sarcoma has been reported to occur in patients receiving corticosteroids therapy.
Discontinuation of corticosteroids may result in clinical remission.
Pheochromocytoma crisis, which can be fatal, has been reported after administration of systemic costicosteroids.
Costicosteroids should only be administered to patients with suspected or indentified pheochromocytoma after an appropriate risk/ benefit evaluation.
Hydrocortisone can cause evaluation blood evaluation, salt and water retention and increased excreation of potassium. Dietary salt restriction and potassium supplementation may be necessary. All corticosteroids increase calcium excreation.
Patients and/or carers should be warned that potentially severe psychiatric adverse reactions may occur with systemic steroids. Symptoms typically emerge within a few days or weeks of starting treatment. Risks may be higher with high doses/systemic exposure that can increase the risk of side effects), although dose levels do not allow prediction of the onset, type, severity or duration of reactions. Most reactions recover after either dose reduction or withdrawal, although specific treatment may be necessary. Patients/carers should be encouraged to seek medical advice if worrying psychological symptoms develop, especially if depressed mood or suicidal ideation is suspected.
Patients/carers should be alert to possible psychiatric disturbances that may occur either during or immediately after dose tapering/withdrawal of systemic steroids, although such reactions have been reported infrequently.

Particular care is required when considering the use of systemic corticosteroids in patients with existing or previous history of severe affective disorders in themselves or in their first degree relatives.
These would include depressive or manic-depressive illness and previous steroid psychosis.

Paediatric population: Corticosteroids cause growth retardation in infancy, childhood and adolescence, which may be irreversible. Treatment should be limited to the minimum dosage for the shortest possible time.
The use of steroids should be restricted to the most serious indications.
Use in the elderly: The common adverse effects of systemic corticosteroids may be associated with more serious consequences in old age, especially osteoporosis, hypertension, hypokalaemia, diabetes, susceptibility to infection and thinning of the skin. Close clinical supervision is required to avoid life-threatening reactions.

Systemic corticosteroids are not indicated for, and therefore should not be used to treat traumatic brain injury or stroke because it is unlikely to be of benefit and may even be harmful. For traumatic brain injury a multicenter study revealed an increased mortality at 2 weeks and 6 months after injury in patients administered methylprednisolone sodium succinate compared to placebo. A casual association with methylprednisolone sodium succinate treatment has not been established.

Special warnings
Corticosteroids should not be used in the treatment of cerebral oedema associated with acute head injury or cerebrovascular accident, as they are unlikely to be of benefit and may even be harmful.
In patients who have received more than physiological doses of systemic corticosteroids (approximately 30mg hydrocortisone) for greater than three weeks, withdrawal should not be abrupt. Clinical assessment of disease activity may be needed during withdrawal. If the disease is unlikely to relapse on withdrawal of systemic corticosteroids but there is uncertainty about hypothalamic-pituitary-adrenal (HPA)-axis suppression, the dose of systemic corticosteroid may be reduced rapidly to physiological doses. Once a daily dose of 30mg hydrocortisone is reached, dose reduction should be slower to allow the HPA-axis to recover.
Abrupt withdrawal of systemic corticosteroid treatment, which has continued for up to three weeks is appropriate if it is considered that the disease is unlikely to relapse. Abrupt withdrawal of doses of up to 160mg hydrocortisone for three weeks is unlikely to lead to clinically relevant HPA-axis suppression, in the majority of patients. In the following patient groups, gradual liver and therefore patients should be monitored frequently. Care and monitoring are also required in patients with renal

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Most adverse reactions resolve after either dose reduction or withdrawal of the medicine, although specific treatment may be necessary. Patients/carers should be encouraged to seek medical advice if worrying psychological symptoms develop, especially if depressed mood or suicidal ideation is suspected. Patients/carers should also be alert to possible psychiatric disturbances that may occur either during or immediately after dose tapering/withdrawal of systemic steroids, although such reactions have been reported infrequently.
Particular care is required when considering the use of systemic corticosteroids in patients with existing or a previous history of severe affective disorders in themselves or in their first-degree relatives. These would include depressive or manic-depressive illness and previous steroid psychosis.

Adverse Effect:
Since Hydrocortisone Sodium Succinate for Injection is normally employed on a short -term basis it is unlikely that side effects will occur; however, the possibility of side effects attributable to corticosteroid therapy should be recognized. Such side effects include:

Adverse Reactions table	
System Organ Class	Frequency Not Known (Cannot be estimated from available data)
Infections and infestations	Infection masked; Opportunistic infection
Neoplasms benign, malignant and unspecified (including cysts and polyps)	Kaposi's sarcoma (has been reported to occur in patients receiving corticosteroid therapy)
Immune system disorders	Hypersensitivity (including anaphylaxis and anaphylactoid reactions [e.g. bronchospasm, laryngeal oedema, urticaria]); May suppress reactions to skin tests
Blood and lymphatic system disorders	Leucocytosis
Endocrine disorders	Cushingoid; Pituitary-adrenal axis suppression; WITHDRAWAL SYMPTOMS - Too rapid a reduction of corticosteroid dosage following prolonged treatment can lead to acute adrenal insufficiency, hypotension and death. However, this is more applicable to corticosteroids with an indication where continuous therapy is given. A 'withdrawal syndrome' may also occur including, fever, myalgia, arthralgia, rhinitis, conjunctivitis, painful itchy skin nodules and loss of weight
Metabolism and nutrition disorders	Sodium retention; Water retention; Alkalosis hypokalaemic; Glucose tolerance impaired; Increased appetite; Weight increased
Psychiatric disorders	Affective disorders (such as irritable, euphoric, depressed and labile mood psychological dependence and suicidal thoughts); Psychotic reactions (including mania, delusions, hallucinations and aggravation of schizophrenia); Behavioural disturbances; Irritability; Anxiety;
	Sleep disturbances; Cognitive dysfunction including confusion and amnesia
Nervous system disorders	Increased intra-cranial pressure with papilloedema in children (pseudotumour cerebri) has been reported, usually after treatment withdrawal of hydrocortisone; Benign intracranial hypertension; Convulsions; Epidural lipomatosis
Eye disorders	Cataract subcapsular; Glaucoma; Exophthalmos; Increased intra-ocular pressure, with possible damage to the optic nerve; Corneal or scleral thinning; Exacerbation of ophthalmic viral or fungal disease; Central serous chorioretinopathy
Cardiac disorders	Cardiac failure congestive (in susceptible patients); Myocardial rupture following a myocardial infarction
ascular disorders	Hypertension; Thrombosis including Thromboembolism
Respiratory, thoracic and mediastinal disorders	Hiccups; Pulmonary embolism
Gastrointestinal disorders	Peptic ulcer (with possible perforation and haemorrhage); Gastric haemorrhage; Pancreatitis; Abdominal distension; Oesophageal ulceration; Oesophageal candidiasis; Intestinal perforation; Dyspepsia; Nausea
Skin & subcutaneous tissue disorders	Petechiae; Telangiectasia; Ecchymosis; Skin atrophy; Skin striae; Skin hyperpigmentation; Skin hypopigmentation; Hirsutism; Acne; Hyperhidrosis
Musculoskeletal, connective tissue and bone disorders	Myopathy; Muscular weakness; Osteonecrosis; Osteoporosis; Pathological fracture; Growth retardation
Reproductive system and breast disorders	Menstruation irregular; Amenorrhoea
General disorders and administration site conditions	Impaired healing; Abscess sterile; Malaise
Investigations	Carbohydrate tolerance decreased; Increased insulin requirement (or oral hypoglycemic agents in diabetics); Blood potassium decreased; Nitrogen balance negative (due to protein catabolism); Urine calcium increased; Alanine aminotransferase increased; Aspartate aminotransferase increased; Blood alkaline phosphatase increased
Injury, poisoning and procedural complications	Spinal compression fracture; Tendon rupture (particularly of the Achilles tendon)

Interaction:

1. Convulsions have been reported with concurrent use of corticosteroids and ciclosporin. Since concurrent administration of these agents results in a mutual inhibition of metabolism, it is possible that convulsions and other adverse effects associated with the individual use of either drug may be more apt to occur.
2. Drugs that induce hepatic enzymes, such as rifampicin, rifabutin, carbamazepine, phenobarbitone, phenytoin, primidone and aminoglutethimide enhance the metabolism of corticosteroids and it's therapeutic effects may be reduced.
3. Drugs which inhibit the CYP3A4 enzyme, such as cimetidine, erythromycin, ketoconazole, itraconazole, diltiazem and mibefradil, may decrease the rate of metabolism of corticosteroids and hence increase the serum concentration.
4. Steroids may reduce the effects of anticholinesterase in myasthenia gravis. The desired effects of hypoglycaemic agents (including insulin), anti-hypertensives and diuretics are antagonised by conticosteroids, and the hypokalaemic effects of acetazolamide, loop diuretics, thiazide diuretics and carbenoxolone are enhanced.
5. The efficacy of coumarin anticoagulants may be enhanced by concurrent corticosteroid therapy and close monitoring of the INR or prothrombin time is required to avoid spontaneous bleeding.
6. The renal clearance of salicylated is increased by corticosteroids and steroid withdrawal may result in salicylate intoxication. Salicylates and non-steroidal anti-inflammatory agents should be used cautiously in conjunction with corticosteroids in hypothrombinaemia.
7. Steroids have been reported to interact with neuromuscular blocking agents such as pancuronium with partial reversal of the neuromuscular block.

Pregnancy:
The ability of corticosteroids to cross the placenta varies between individual drugs, however, hydrocortisone readily crosses the placenta.
Administration of corticosteroids to pregnant animals can cause abnormalities of foetal development including cleft palate, intra-uterine growth retardation and effects on brain growth and development. There is no evidence that corticosteroids result in an increased incidence of congenital abnormalities, such as cleft palate in man, however, when administered for long periods or repeatedly during pregnancy, corticosteroids may increase the risk of intra-uterine grown retardation. Hypoadrenalism may, in theory, occur in the neonate following prenatal exposure to corticosteroids but usually resolves spontaneously following birth and rarely clinically important. As with all drugs, corticosteroids should only be prescribed when the benefits to the mother and child outweigh the risks. When corticosteroids are essential, however, patents with normal pregnancies may be treated as though they were in the non-gravid state.

Lactation:
Corticosteroids are excreted in breast milk, although no data are available for hydrocostisone.
Doses up to 160 mg daily of hydrocortisone are unlikely to cause systemic systemic effects in the infant. Infants of mothers taking higher doses than this may have a degree of adrenal suppression, but the benefits of breast-feeding are likely to outweigh any theoretical risk.

Fertility:
Corticosteroids have been shown to impair fertility in animal studies. Adverse effects on fertility in rats with corticosterone were observed in males only and were reversible. The clinical relevance of this information is uncertain.

Adverse Drug Reactions
Co-treatment with CYP3A inhibitors, including cobicistat-containing products. is expected to increase the risk of systematic side-effects. The combination should be avoided unless the benefit outweighs the increased risk of systemic corticosteroid side-effects, in which case patients should be monitored for systematic corticosteroid side-effects.
Drug interactions: rifampicin, rifabutin, carbamazepine, phenobarbital, phenytoin, primidone, ephedrine and aminoglutethimide enhance the metabolism of corticosteroids and their therapeutic effects may be reduced.
The desired effects of hypoglycemic agents (including insulin), anti-hypertensives and diuretics are antagonized by corticosteroids, and the hypokalemic effects of acetazolamide, loop diuretics, thiazide diuretics and carbenoxolene are enhanced. The efficacy of coumarin anticoagulants may be enhanced by concurrent corticosteroid therapy and close monitoring of the INR of prothrombin time is required to avoid spontaneous bleeding.
The renal clearance of salicylates is increased by corticosteroids and steroid withdrawal may result in salicylate intoxication.
Steroids may reduce the effects of anticholinesterases in myasthenia gravis and cholecystographic x-ray media.

Overdosage: There is no clinical syndrome of acute overdosage with Hydrocortisone Sodium Succinate for injection, Hydrocortisone is dialysable.
The constituted solution should be used only if clear & discard after 48 hours.

Storage: Store at temperature not exceeding 30°C.

Keep all medicines out of reach of children.

Caution:
Foods, Drugs, Devices and Cosmetics Act prohibits dispensing without prescription.

Adverse Drug Reactions Reporting Statements
For suspected adverse drug reaction, seek medical attention immediately and report to the FDA at www.fda.gov.ph and Biocare Lifesciences, Inc. at (02) 4037032 or e-mail regulatory@ pvbiocarelifesciences.com

By reporting undesirable effects, you can help provide more information on the safety of this medicines.

Availability:USP Type III Clear and colorless glass vial (Box of 1's)

DRP-7618
Date of First Authorization: 09 January 2018
Date of Revision: 26 April 2024

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