USER INFORMATION

INJECSOL LIG2

LIGNOCAINE HYDROCHLORIDE INJECTION 2% w/v

Sterile and Non Pyrogenic

Composition:
Each mL solution contains 20mg Lignocaine (Lidocaine) Hydrochloride is equivalent to 21.32 mg of Lignocaine (Lidocaine) Hydrochloride (as monohydrate).
Each 5mL solution contains Lignocaine Hydrochloride 100mg.
Each 10mL solution contains Lignocaine Hydrochloride 200mg.

Characteristics:
INJECSOL LIG2 is a sterile, clear and colourless solution for injection.

Pharmacodynamics:
Lignocaine is a local anaesthetic of the amide type. It is used to provide local anaesthesia at various sites in the body and it acts by inhibiting the ionic refluxes required for the initiation and conduction of impulses, thereby stabilising the neuronal membrane. In addition to blocking conduction in nerve axons in the peripheral nervous system, Lignocaine has important effects on the central nervous system and cardiovascular system. After absorption, lignocaine may cause stimulation of the CNS followed by depression and in the cardiovascular system; it acts primarily on the myocardium where it may produce decreases in electrical excitability, conduction rate and force of contraction.

Pharmacokinetics:
Lignocaine is absorbed from injection sites including muscle and its rate of absorption is determined by factors such as the site of administration and the tissue vascularity. Except for intravascular administration, the highest blood levels occur following intercostals nerve block and the lowest after subcutaneous administration. Lignocaine is bound to plasma proteins, including alpha-1-acidglycoprotein. The drug crosses the blood-brain and placental barriers. Lignocaine is metabolised in the liver and about 90% of a given dose undergoes N-dealkylation to form monoethylglycinexylidide and glycinexylidide, both of which may contribute to the therapeutic and toxic effects of lignocaine. Further metabolism occurs and metabolites are excreted in the urine with less than 10% as unchanged lignocaine. The elimination half-life of lignocaine following an intravenous bolus injection is one to two hours, but this may be prolonged in patients with hepatic dysfunction.

Indication:
Lignocaine is a local anaesthetic of the amide group. Lignocaine Hydrochloride Injection is for use in infiltration anaesthesia, intravenous regional anaesthesia and nerve blocks. Treatment or prophylaxis of life-threatening ventricular anhythmias, including those associated with myocardial infarction, general anaesthesia in patients predisposed to ventricular arrhythmias, digitalis intoxication, or following resuscitation from cardiac arrest.

Recommended Dosage:
As a local anaesthetic for infiltration and nerve block:
The dosage varies and depends upon the area to be anaesthetized, vascularity of the tissues, number of neuronal segments to be blocked, individual tolerance and the technique of anaesthesia. The lowest dose needed to provide effective anaesthesia should be administered. For specific techniques and procedures, refer to standard textbooks.

Adult:

Infiltration:
Percutaneous: 5 to 500 mg.

Peripheral nerve block:
Bronchial: 225 to 300 mg
Intercostal: 30 mg
Paracervical: 100 mg per side as a 1% solution; may be repeated if necessary at intervals of not less than 90 minutes.
Paravertebral: 30 to 50 mg.
Retrobulbar: 120 to 200 mg.

Sympathetic nerve block:
Cervical (stellate ganglion): 50 mg
Transtracheal: 80 to 120 mg. In addition a 4% spray to the pharynx may be required to achieve complete analgesia.
Usual adult prescribing limits: Not to exceed 4.5 mg per kg of body weight.

Usual pediatric dose:

Local infiltration: Up to 4.5 mg per kg body weight as a 0.25 to 0.5% solution.
Nerve block: Up to 4.5 mg per kg of body weight as a 0.5 to 1% solution.

Note: Dosage must be individualized by physician, based on patients age and weight. For local infiltration, concentration of 0.25% to 0.5% are recommended for use in infants; concentrations of 0.5% are recommended for other pediatric patients.

For intravenous use in cardiac arrhythmias:
Patients with congestive heart failure or cardiogenic shock may require smaller bolus doses.

Adults: The usual dose is lignocaine 50 to 100 mg administered intravenously under ECG monitoring. The dose may be injected at a rate of approximately 25 to 50 mg (2.5 to 5.0 mL of the lignocaine 1% solution or 1.25 to 2.5 mL of the 2% solution) per minute. A sufficient period of time should be allowed to enable a slow circulation to carry the drug to the site of action. If the initial dose of 50 to 100 mg does not produce the desired response, a second dose may be given after five minutes. No more than 200 to 300 mg of lignocaine should be administered during a one hour period.
Following a single injection in those patients in whom arrhythmia tends to recur and who are incapable of receiving oral antiarrhythmic therapy, intravenous infusions of lignocaine may be administered at a rate of 1 to 4 mg/minute (20 to 50 mcg/kg/minute).
Intravenous infusions must be given under ECG monitoring to avoid potential overdosage and toxicity. The infusion should be terminated as soon as the patient's cardiac rhythm appears to be stable or at the earliest signs of toxicity. It should rarely be necessary to continue the infusion beyond 24 hours. As soon as possible, patients should be changed to an oral antiarrhythmic agent for maintenance therapy.

Paediatrics: For children, a reduced dose based on body weight or surface area should be used. It is recommended that the 1% solution be used to minimise the possibility of toxic effects. Experience with lignocaine is limited.
A suggested paediatric dose is a loading dose of 0.5 to 1 mg/kg repeated if necessary up to 3-5 mg/kg, followed by continuous infusions of 10 to 50 mcg/kg/minute.

Geriatrics: A reduction in dosage may be necessary for elderly patients, particularly those with compromised cardiovascular and/or hepatic function.

Impaired hepatic function: Although lignocaine is metabolised by the liver, dosage reduction for local anaesthesia is probably not warranted. However, caution should be exercised with repeated doses or prolonged infusion.

Impaired renal function: Impairment of renal function is unlikely to affect lignocaine clearance in the short term (up to 24 hours). However, toxicity due to accumulation may develop with prolonged or repeated administration.

Incompatibilities: Although no specific incompatibilities have been reported the introduction of any additive requires caution. Do not administer unless the solution is clear.

Route of Administration: Intravenous(IV)/ Intramuscular(IM)/ Subcutaneous(SC)
The method of administration of Lignocaine varies according to the procedure (infiltration anaesthesia, intravenous regional anaesthesia or nerve block).

Contraindications:
Known hypersensitivity to anaesthetics of the amide type; hypovolaemia; complete heart block.

Warnings and Precautions:
Lignocaine should only be used by people with skills in resuscitation. Facilities and equipment for resuscitation should be available when administering local anaesthetics. As with other local anaesthetics, Lignocaine should be used with caution in patients with epilepsy, myasthenia gravis, congestive cardiac failure, bradycardia or respiratory depression, including where agents are known to interact with Lignocaine either to increase its availability or additive effects e.g. phenytoin or prolong its elimination e.g. hepatic or end renal insufficiency where the metabolites of Lignocaine may accumulate. The effect of local anaesthetics may be reduced if the injection is made into an inflamed or infected area. Intramuscular Lignocaine may increase creatinine phosphokinase concentrations which can interfere with the diagnosis of acute myocardial infarction. Lignocaine has been shown to be porphyrinogenic in animals and should be avoided in persons suffering from porphyria. Hypokalaemia, hypoxia and disorder of acid-base balance should be corrected before treatment with intravenous Lignocaine begins. Certain local anaesthetic procedures may be associated with serious adverse reactions, regardless of local anaesthetic drug used. Central nerve blocks may cause cardiovascular depression, especially in the presence of hypovolaemia, and therefore epidural anaesthesia should be used with caution in patients with impaired cardiovascular function. Epidural anaesthesia may lead to hypotension and bradycardia. This risk can be reduced by preloading the circulation with crystalloidal or colloidal solutions. Hypotension should be treated promptly. Paracervical block can sometimes cause foetal bradycardia or tachycardia and careful monitoring of foetal heart rate is necessary. Injections in the head and neck region may be made inadvertently into an artery causing cerebral symptoms even at low doses. Retrobulbar injections may rarely reach the cranial subarachnoid space, causing serious/ severe reactions including cardiovascular collapse, apnoea, convulsions and temporary blindness. Retro- and peribulbar injections of local anaesthetics carry a low risk of persistent ocular motor dysfunction. The primary causes include trauma and/or local toxic effects on muscles and/or nerves. The severity of such tissue reactions is related to the degree of trauma, the concentration of the local anaesthetic and the duration of exposure of the tissue to local anaesthetic. For this reason, as with all local anaesthetic, the lowest effective concentration and dose of local anaesthetic should be used. Lignocaine Injection is not recommended for use in neonates. The optimum serum concentration of Lignocaine required to avoid toxicity, such as convulsions and cardiac arrhythmias, in this age group is not known.

Interactions with Other Medicaments:
While adrenaline when used in conjunction with Lignocaine might decrease vascular absorption, it greatly increases the danger of ventricular tachycardia and fibrillation if accidentally injected intravenously. Dopamine and 5-hydroxytryptamine reduce the convulsant threshold of Lignocaine. Narcotics are probably proconvulsants and this would support the evidence that Lignocaine reduces the seizure threshold of fentanyl in man. Opioid-antiemetic combination sometimes used for sedation in children could reduce the convulsant threshold of Lignocaine and increase the CNS depressant effect. Cimetidine and propranolol depress microsomal enzyme activity, thus enhancing Lignocaine toxicity during anti-arrhythmic infusions if concomitantly administered with these drugs, requiring a reduction in the dosage of Lignocaine. Ranitidine produces a small reduction in renal clearance. Increase in serum levels of Lignocaine may also occur with anti-viral agents (e.g. amprenavir, atazanavir, darunavir, lopinavir). Hypokalaemia caused by diuretics may antagonize the action of Lignocaine if administered concomitantly. Cardiovascular collapse has been reported following the use of bupivacaine in patients on treatment with verapamil and timolol; Lignocaine is closely related to bupivacaine. Lignocaine should be used with caution in patients receiving other local anaesthetics or agents related structurally to amide-type local anaesthetics (e.g. anti-arrhythmics, such as mexiletine), since the systemic toxic effects are additive. Specific interaction studies with Lignocaine and class III anti-arrhythmic drugs (e.g. amiodarone) have not been performed, but caution is advised. There may be an increased risk of ventricular arrhythmia in patients treated concurrently with antipsychotics which prolong or may prolong the QT interval (e.g. pimozide, sertindole, olanzapine, quetiapine, zotepine), prenylamine, adrenaline (if accidently injected intravenously)) or 5HT3 antagonists (e.g. tropisetron, dolasetron). Concomitant use of quinupristin/dalfopristin may increase Lignocaine levels with a subsequent increased risk of ventricular arrhythmias and therefore should be avoided. There may be an increased risk of enhanced and prolonged neuromuscular blockade in patients treated concurrently with muscle relaxants (e.g.suxamethonium).

Statement on Usage During Pregnancy and Lactation:
Pregnancy:
Although animal studies have revealed no evidence of harm to the foetus, Lignocaine crosses the placenta and should not be administered during early pregnancy unless the benefits are considered to outweigh the risks. Lignocaine readily crosses the placental barrier after epidural or intravenous administration to the mother. The ratio of umbilical to maternal venous concentration is 0.5 to 0.6. The foetus appears to be capable of metabolising Lignocaine at term. The elimination half life in the newborn of the drug received in utero is about three hours, compared with 100 minutes in the adult. Elevated Lignocaine levels may persist in the newborn for at least 48 hours after delivery. Foetal bradycardia or tachycardia, neonatal bradycardia, hypotonia or respiratory depression may occur.

Lactation:
Small amounts of Lignocaine are secreted into breast milk and the possibility of an allergic reaction in the infant, albeit remote, should be borne in mind when using Lignocaine in nursing mothers.

Adverse Effects / Undesirable Effects:
In common with other local anaesthetics, adverse reactions to Lignocaine are rare and are usually the result of raised plasma concentrations due to accidental intravascular injection, excessive dosage or rapid absorption from highly vascular areas, or may result from a hypersensitivity, idiosyncrasy or diminished tolerance on the part of the patient. Systemic toxicity mainly involves the central nervous system and/or the cardiovascular system.

Immune system disorders
Hypersensitivity reactions (allergic or anaphylactoid reactions, anaphylactic shock) see also skin & subcutaneous tissue disorders. Skin testing for allergy to Ligocaine is not considered to be reliable.

Nervous & Psychiatric disorders
Neurological signs of systemic toxicity include dizziness or light-headedness, nervousness, tremor, circumoral paraesthesia, tongue numbness, drowsiness, convulsions and coma. Nervous system reactions may be excitatory and/or depressant. Signs of CNS stimulation may be brief, or may not occur at all, so that the first signs of toxicity may be confusion and drowsiness, followed by coma and respiratory failure. Neurological complications of spinal anaesthesia include transient neurological symptoms such as pain of the lower back, buttock and legs. These symptoms usually develop within twenty-four hours of anaesthesia and resolve within a few days. Isolated cases of arachnoiditis or cauda equina syndrome, with persistent paraesthesia, bowel and urinary dysfunction, or lower limb paralysis have been reported following spinal anaesthesia with Lignocaine and other similar agents. The majority of cases have been associated with hyperbaric concentrations of Lignocaine or prolonged spinal infusion.

Eye disorders
Blurred vision, diplopia and transient amaurosis may be signs of Lignocaine toxicity. Bilateral amaurosis may also be a consequence of accidental injection of the optic nerve sheath during ocular procedures. Orbital inflammation and diplopia have been reported following retro or peribulbar anaesthesia.

Ear and labyrinth disorders
Tinnitus, hyperacusis.

Cardiac and vascular disorders
Cardiovascular reactions are depressant and may manifest as hypotension, bradycardia, myocardial depression, cardiac arrhythmias and possibly cardiac arrest or circulatory collapse. Hypotension may accompany spinal and epidural anaesthesia. Isolated cases of bradycardia and cardiac arrest have also been reported.

Respiratory, thoracic or mediastinal disorders
Dyspnoea, bronchospasm, respiratory depression, respiratory arrest.

Gastrointestinal
Nausea, vomiting

Skin & subcutaneous tissue disorders
Rash, urticaria, angioedema, face oedema.

Overdose and Treatment:
Symptoms of acute systemic toxicity:
Central nervous system toxicity presents with symptoms of increasing severity. Patients may present initially with circumoral paraesthesia, numbness of the tongue, light-headedness, hyperacusis and tinnitus. Visual disturbances and muscular tremors or muscle twitching are more serious and precede the onset of generalised convulsions. These signs must not be mistaken for neurotic behaviour. Unconsciousness and grand mal convulsions may usually follow, which may last from a few second to several minutes. Hypoxia and hypercapnia occur rapidly following convulsions due to increase muscular activity, together with the interference with normal respiration and loss of the airway. In severe cases, apnoea may occur. Acidosis increases the toxic effects of local anaesthetics.
Effects on the cardiovascular system may be seen in severe cases. Hypotension, bradycardia, arrhythmia and cardiac arrest may occur as a result of high systemic concentrations, with potentially fatal outcome.
Recovery occurs as a consequence of redistribution of the local anaesthetic drug from the central nervous system, and metabolism and may be rapid unless large amounts of the drug have been injected.

Treatment of acute toxicity:
If signs of acute systemic toxicity appear, injection of the anaesthetic should be stopped immediately. Treatment will be required if convulsions and CNS depression occurs. The objectives of treatment are to maintain oxygenation, stop the convulsions and support the circulation. A patent airway should be established and oxygen should be administered, together with assisted ventilation (mask and bag) if necessary.
The circulation should be maintained with infusions of plasma or intravenous fluids. Where further supportive treatment of circulatory depression is required, use of a vasopressor agent may be considered although this involves a risk of CNS excitation. If convulsions do not stop spontaneously in 15-20 seconds, they may be controlled by the intravenous administration of Diazepam or Thiopentone Sodium, bearing in mind that anti-convulsant drugs may also depress respiration and the circulation. Prolonged convulsions may jeopardize the patient's ventilation and oxygenation and early endotracheal intubation should be considered. If cardiac arrest should occur, standard cardiopulmonary resuscitation procedures should be instituted. Continual optimal oxygenation and ventilation and circulatory support as well as treatment of acidosis are of vital importance.
Dialysis is of negligible value in the treatment of acute overdosage with Lignocaine.

Incompatibilities:
Lignocaine caused precipitation of amphotericin, methohexital sodium and sulfadiazine sodium in glucose injection. It is recommended that admixtures of lignocaine and glyceryltrinitrate should be avoided.

Storage Condition:
Do not store above 30°C.

Shelf life:
2 years from manufacturing date in proposed storage condition in LDPE ampoule. Do not use after expiry.

Dosage form and packaging available:
5mL X 20 LDPE plastic ampoules per box
10mL X 20 LDPE plastic ampoules per box

Manufacturer/ Product Registration Holder:

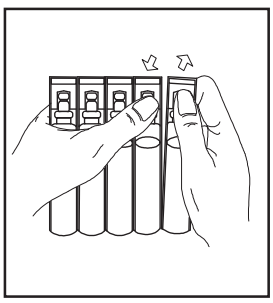
AIN MEDICARE SDN. BHD.
Lot 4933, 4934 & PT2464, Jalan 6/44, Kaw. Perindustrian Pengkalan Chepa 2, 16100 Kota Bharu, Kelantan, MALAYSIA

Date of Revision : 26.08.19

HANDLING INSTRUCTION

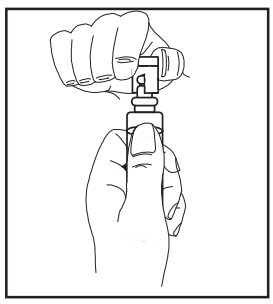
AIN MEDICARE INJECTION FLUID IN POLYETHYLENE (PE) AMPOULE

1)



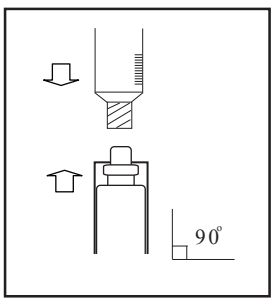
Detach ampoule along parting line

2)



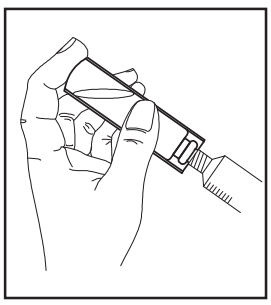
Twist off tab

3)



Attach luer lock syringe, luer slip syringe or hypodermic needle vertically to the ampoule.

4)



Draw out injection fluid using luer lock syringe, luer slip syringe or hypodermic needle. Ensure the connection is tightly secured for effective aspiration of the liquid.