AUSTRALIAN PRODUCT INFORMATION – DBL™ POTASSIUM ACETATE CONCENTRATED INJECTION (POTASSIUM ACETATE)

1. NAME OF THE MEDICINE

Potassium acetate

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

DBL Potassium Acetate Concentrated Injection contains 490.0 mg of potassium acetate in each mL of water for injections. The strength supplied is 2.45 g/5 mL in a glass ampoule. Each mL of injection contains 200 mg of potassium. Each mL of DBL Potassium Acetate Concentrated Injection contains 5 mEq (5 mmol) of potassium ions and 5 mEq (5 mmol) of acetate ions.

For the full list of excipients, see **Section 6.1 List of excipients**.

3. PHARMACEUTICAL FORM

DBL Potassium Acetate Concentrated Injection is a clear, colourless solution. The pH of the solution ranges between 7.5 and 8.5.

4. CLINICAL PARTICULARS

4.1 Therapeutic Indications

DBL Potassium Acetate Concentrated Injection is indicated for the prophylaxis and treatment of hypokalaemia in patients with or without metabolic acidosis; in chronic digitalis intoxication; and in patients with hypokalaemic familial periodic paralysis. DBL Potassium Acetate Concentrated Injection is only indicated when oral therapy is contraindicated or not tolerated.

DBL Potassium Acetate Concentrated Injection is also indicated for use in total parenteral nutrition (TPN) solutions as an electrolyte supply.

4.2 Dose and Method of Administration

DBL POTASSIUM ACETATE CONCENTRATED INJECTION MUST BE DILUTED WITH A SUITABLE INFUSION SOLUTION PRIOR TO ADMINISTRATION (see **Section 4.2 Dose and method of administration - Compatibilities**).

Do not administer unless solution is clear and seal is intact. Discard unused portion.

Each mL of DBL Potassium Acetate Concentrated Injection contains 5 mEq (5 mmol) of potassium ions and 5 mEq (5 mmol) of acetate ions.

Potassium is administered by intravenous infusion; the dose and rate of infusion are dependent on individual patient requirements. In patients whose serum potassium concentration is above

2.5 mEq/L (2.5 mmol/L), the rate of infusion should not exceed 10 mEq/hour (10 mmol/hour). The concentration of potassium within the prepared infusion should be less than 40 mEq/L. The total daily dose should normally not exceed 150 mEq/24 hours (150 mmol/24 hours) in adults, and children should not receive in excess of 3 mmol/kg per day.

Care must be taken to avoid extravasation. Dehydrated patients should initially receive one litre of potassium free fluid and urine flow must be adequate before potassium solutions are administered.

For urgent treatment [plasma potassium concentration < 2 mEq/L (2 mmol/L) with electrocardiogram (ECG) changes or paralysis], infuse potassium at a rate of 40 mEq/hour (40 mmol/hour), up to a maximum of 400 mEq/24 hour period (400 mmol/24 hour). If doses greater than 20 mEq/hour are used, an infusion pump, ECG and frequent serum potassium monitoring are essential. In critical states, potassium may be infused in saline (unless saline is contraindicated) rather than in glucose solutions, as the latter may decrease plasma potassium concentrations.

Potassium acetate has also been incorporated into the formulation of total parenteral nutrition (TPN) solutions.

Compatibilities

Potassium acetate is reported to be compatible with the following infusion fluids: 5% glucose intravenous infusion, 10% glucose intravenous infusion, 0.9% sodium chloride intravenous infusion, Lactated Ringer's Injection, Hartmann's Solution for Injection, and 5% glucose in Lactated Ringers Injection.

4.3 Contraindications

Potassium acetate concentrated injection is contraindicated for use in patients with the following disorders:

- metabolic or respiratory alkalosis (use oral potassium chloride if possible) as acetate is a precursor of bicarbonate and may exacerbate the condition
- severe renal impairment with associated oliguria, anuria or azotaemia
- hyperkalaemia including the hyperkalaemic form of familial periodic paralysis
- untreated chronic adrenocortical insufficiency (Addison's disease)
- acute dehydration
- ventricular fibrillation
- atrioventricular or intraventricular heart block
- extensive tissue breakdown (e.g. severe burns)
- heat cramps
- diarrhoea, severe or prolonged, as renal function may be impaired with the combination of fluid loss and potassium administration
- uncontrolled diabetes mellitus
- hyperadrenalism associated with adrenogenital syndrome

- hypersensitivity to potassium

4.4 Special Warnings and Precautions for Use

POTASSIUM ACETATE CONCENTRATED INJECTION MUST BE DILUTED WITH A COMPATIBLE INFUSION FLUID PRIOR TO ADMINISTRATION (see **Section 4.2 Dosage and method of administration**).

Diluted solutions of potassium acetate must be administered slowly to the patient. Hyperkalaemia may result from rapid intravenous injection of potassium. Elevated plasma potassium concentration (8 to 11 mEq/L) may cause death from cardiac depression, arrhythmias, or arrest.

In patients with impaired mechanisms for excreting potassium (e.g. chronic renal disease, adrenal insufficiency), administration of potassium salts can produce hyperkalaemia and cardiac arrest, especially if administered intravenously. Potentially fatal hyperkalaemia can develop rapidly and asymptomatically. Therefore, careful monitoring of serum potassium concentration and appropriate dosage adjustment is recommended.

Potassium acetate concentrated injection should not be used concomitantly with potassium sparing diuretics such as amiloride, triamterene and spironolactone or other drugs causing hyperkalaemia such as angiotensin converting enzyme (ACE) inhibitors (e.g. captopril, lisinopril, enalapril, quinapril, perindopril, fosinopril and ramipril) in patients with hypokalaemia. Simultaneous administration of these agents can result in severe hyperkalaemia.

Hyperkalaemia has occurred following addition of concentrated potassium chloride solutions to infusions from a hanging flexible plastic container, apparently as a result of pooling of the concentrated potassium solution at the base of the container and infusion of undiluted solution. Squeezing the container did not facilitate mixing but tended to pump the concentrated solution into the infusion chamber. Mixing of the solutions can be achieved if the plastic container is inverted during the addition of potassium solutions and subsequently agitated and/or kneaded.

The treatment of potassium depletion, particularly in the presence of cardiac disease, renal disease or acidosis requires careful attention to acid-base balance and appropriate monitoring of serum electrolytes, electrocardiogram and the patient's clinical status.

Use potassium with caution in diseases associated with heart block since increased serum potassium may increase the degree of block.

Acetate should be administered with great care in those conditions in which there is an increased level or an impaired utilisation of this ion, such as severe hepatic insufficiency.

Solutions containing acetate ion should be used with caution as excess administration may result in metabolic alkalosis.

Use in the elderly

An evaluation of current literature revealed no clinical experience identifying differences in response between elderly and younger patients. In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosing range, reflecting the greater

frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy in this age group.

Potassium ions are known to be substantially excreted by the kidney, and the risk of toxic reactions 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.

Paediatric use

No data available.

Effects on laboratory tests

No data available.

4.5 Interactions with Other Medicines and Other Forms of Interactions

Potassium interacts with the following drugs:

Potassium sparing diuretics: Drugs of this class, e.g. triamterene, spironolactone and amiloride, when given together with potassium, may cause hyperkalaemia.

Angiotensin Converting Enzyme (ACE) inhibitors: Enalapril and captopril, lisinopril, quinapril, perindopril, fosinopril and ramipril, when given together with potassium, may induce hyperkalaemia.

Digoxin: Potassium protects the cardiac muscle from the effects of digoxin toxicity.

Bicarbonate: Hypokalaemia may not be reversed when potassium supplements are given at the same time as bicarbonate.

4.6 Fertility, Pregnancy and Lactation

Effects on fertility

No data available.

Use in pregnancy

Potassium is a natural constituent of human tissues and fluids. Exogenous potassium may be indicated as replacement therapy for pregnant women with low potassium levels: treatment with oral therapy is always preferred. Since high levels of potassium are detrimental to maternal and foetal cardiac function, serum levels should be closely monitored in pregnant women receiving potassium therapy.

Use in lactation

Potassium is excreted into breast milk; the normal potassium content of breast milk is 13 mEq/L.

4.7 Effects on Ability to Drive and Use Machines

The effects of this medicine on a person's ability to drive and use machines were not assessed as part of its registration.

4.8 Adverse Effects (Undesirable Effects)

Pain at the injection site and phlebitis may occur during intravenous administration of solutions containing 30 mEq or more potassium per litre.

Hyperkalaemia is the most common and serious hazard of therapy with potassium. Clinical signs and symptoms of hyperkalaemia include paraesthesiae of the extremities, listlessness, mental confusion, weakness or heaviness of the legs, flaccid paralysis, cold skin, grey pallor, peripheral vascular collapse with fall in blood pressure, cardiac arrhythmias, and heart block. Electrocardiogram (ECG) changes that are characteristic of hyperkalaemia include tall peaked T waves, depression of the ST segment, disappearance of the P wave, prolongation of the QT interval, and widening and slurring of the QRS complex with development of a biphasic curve and cardiac arrest.

Reporting suspected adverse effects

Reporting suspected adverse reactions after registration 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 at www.tga.gov.au/reporting-problems.

4.9 Overdose

Symptoms

Excessive administration or impaired excretion of potassium leads to the development of potentially fatal hyperkalaemia (see **Section 4.8 Adverse effects (Undesirable effects)**). Hyperkalaemia is usually asymptomatic and may be manifested only by an increased serum potassium concentration and characteristic electrocardiogram (ECG) changes. Death may result from cardiac depression, arrhythmias or arrest.

Treatment

If hyperkalaemia occurs, the following measures should be considered:

1. Discontinue administration of potassium acetate, potassium sparing diuretics and foods and other medication containing potassium.

2. Intravenous administration of 300 to 500 mL/hour of 10% glucose solution containing 10 to 20 units of crystalline insulin/1000 mL.

3. Correction of acidosis. Intravenous infusion of sodium bicarbonate 45 to 150 mEq over 5 minutes (repeated after 15 to 20 minutes if necessary) has been recommended to correct acidosis.

4. In the presence of life threatening cardiac arrhythmias, intravenous administration of 10 to 50 mL calcium gluconate 10% over 1 to 5 minutes may antagonise the cardiac toxicity. Continuous ECG monitoring is mandatory.

5. With cases of severe hyperkalaemia, treatment with exchange resins, haemodialysis or peritoneal dialysis may become necessary.

In the treatment of hyperkalaemia in digitalised patients, too rapid a lowering of potassium concentration can produce digitalis toxicity.

For information on the management of overdose, contact the Poisons Information Centre on 13 11 26 (Australia). In New Zealand call 0800 764 766.

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Mechanism of action

Potassium is the principal cation (approximately 150 to 160 mEq/L) of intracellular fluid. It is essential for maintenance of acid-base balance, isotonicity and the electrodynamic characteristics of the cell. Disorders of potassium homeostasis are particularly evident because of the vital role that the ion also plays in the maintenance of electrical excitability of nerve impulses; the contraction of cardiac, smooth and skeletal muscles; gastric secretions; normal renal function; tissue synthesis; and carbohydrate metabolism.

In extracellular fluid, sodium ions predominate and the potassium concentration is low (3.5 to 5 mEq/L). A membrane bound enzyme, sodium-potassium activated adenosine triphosphatase (Na^+K^+ATPase), actively transports or pumps sodium out of and potassium into cells to maintain this concentration gradient.

Clinical trials

No data available.

5.2 Pharmacokinetic Properties

Distribution

After intravenous injection, potassium first enters the extracellular fluid and is then actively transported into the cells by the mechanism described above. Glucose, insulin and oxygen facilitate movement of potassium into cells. In healthy adults, plasma potassium concentrations generally are 3.5 to 5 mEq/L, however plasma concentrations up to 7.7 mEq/L may be normal in neonates. Plasma potassium concentrations, however, are not necessarily accurate indicators of cellular potassium concentrations; cellular deficits can occur without decreases in plasma potassium concentrations and hypokalaemia may occur without substantial depletion of cellular potassium.

Potassium concentrations in gastric and intestinal secretions are higher than plasma concentrations, and diarrhoeal fluid may contain up to 60 mEq/L potassium.

Excretion

Potassium is excreted mainly via the kidneys. Potassium is filtered by the glomeruli, reabsorbed in the proximal tubule, and secreted in the distal tubule, the site of sodium-potassium exchange. The capacity of the kidneys to conserve potassium is poor and urinary excretion of potassium continues even when there is severe depletion. Tubular secretion of potassium is influenced by several factors, including chloride ion concentration, hydrogen ion exchange, acid-base equilibrium, and adrenal hormones. Some potassium is excreted in the faeces and small amounts may also be excreted in saliva, sweat, bile and pancreatic juice.

Healthy patients on potassium free diets usually excrete 40 to 50 mEq of potassium daily. Surgery and/or tissue injury result in increased urinary excretion of potassium which may continue for several days. Post-operative patients or patients under stress of disease with

normal kidneys may excrete up to 80 to 90 mEq of potassium daily, even though they are not receiving any potassium.

5.3 Preclinical Safety Data

Genotoxicity

No data available.

Carcinogenicity

No data available.

6. PHARMACEUTICAL PARTICULARS

6.1 List of Excipients

Water for injections

6.2 Incompatibilities

Incompatibilities were either not assessed or not identified as part of the registration of this medicine.

Also refer to **Section 4.5 Interactions with other medicines and other forms of interactions**.

6.3 Shelf life

In Australia, information on the shelf life can be found on the public summary of the Australian Register of Therapeutic Goods (ARTG). The expiry date can be found on the packaging.

6.4 Special Precautions for Storage

Store below 25ºC.

6.5 Nature and Contents of Container

DBL Potassium Acetate Concentrated Injection is available in glass ampoules;

Pack sizes: 10 x 5 mL and 50 x 5 mL ampoules.

Not all pack sizes may be marketed.

6.6 Special Precautions for Disposal

In Australia, any unused medicine or waste material should be disposed of in accordance with local requirements.

6.7 Physicochemical Properties

Chemical structure

No data available.

CAS number

127-08-2

7. MEDICINE SCHEDULE (POISONS STANDARD)

Not scheduled.

8. SPONSOR

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9. DATE OF FIRST APPROVAL

09 November 2007

10. DATE OF REVISION

08 February 2021

Summary Table of Changes

Section changed	Summary of new information
4.2	Additional safety information added pertaining to product use
4.4	Safety information added to Precautions and Warnings
4.8	Addition of further adverse event information