Immunoglobulin (Kiovig) Intravenous for Adults

Who can administer

May be administered by registered competent doctor or nurse/midwife

Important information

- Use Online Dosage Calculator and Order Form- only accessible via HSE computer (GUH useful resources- Pharmacy Medicines Information)
- For haematology and oncology patients please provide patient information leaflet BEFORE first-dose
- See overleaf for monitoring requirements
- This is a **blood product**, therefore batch and expiry information should be recorded in the patient's notes. This is facilitated by putting the dispensing label from each vial into the patient's notes
- Licensed doses vary with the brand of immunoglobulin employed. Discuss with your consultant or pharmacy if further information required
- **Contraindicated** in individuals with known **class specific antibody to Immunoglobulin A**
- **Thromboembolism:** Use caution with IVIg in **obese patients** and in patients with **pre-existing risk factors for thrombotic events**. In patients at risk for thromboembolic adverse reactions, IVIg products should be administered at the **minimum rate of infusion and dose practicable**
- **Glass bottle precautions as follows:**
- Precautions need to be taken during administration to **prevent possible air embolism** - particularly in central line administration.
- Bottles **must be vented** in one of two ways. Directly by means of a filter needle into the bottle which goes through the rubber stopper and opens into the air, or Direct air vent on the air inlet of the administration set, located between the drip chamber and piercing pin, it is covered with a bacterial retentive filter to reduce the chance of contamination

Available preparations

Kiovig 2.5g human normal immunoglobulin per 25mL vial

Kiovig 5g human normal immunoglobulin per 50mL vial

Kiovig 10g human normal immunoglobulin per 100mL vial

Kiovig 20g human normal immunoglobulin per 200mL vial

Kiovig 30g human normal immunoglobulin per 300mL vial

Reconstitution

Already in solution

Infusion fluids

Not required (product ready for infusion)

Methods of intravenous administration

Intermittent intravenous infusion (using an electronically controlled infusion device)

- **Initial rate:** 0.5ml per kg per hour for 30 minutes
- If well tolerated, the rate of administration may be gradually increased to a maximum of 6ml/kg/hour
- Clinical data obtained from a limited number of patients also indicate that adult patients with Primary Immunodeficiency Syndromes may tolerate a rate of up to 8ml/kg/hour
- If reaction occurs during infusion, see 'Further information' for guidance
- When prescribed as a daily dose over several days, the rate will need to be titrated again on each day. However, if it was well tolerated the previous day, the rate may be increased more quickly on subsequent days. (ref 1)
- If prescribed as a daily dose, and on day one it is first administered late in the day, on subsequent days the starting time for administration may be brought back to earlier in the day if required. Gradual titration of the rate will be needed on each day, as before

Infusion rates for KIOVIG- sample calculations. See above for exceptions to rate increases

If a patient's weight falls between two values below, use the lower infusion rate- e.g. patient weight 59kg- use rates for 55kg rather than for 60kg

Increase rate as per table below, every 30 minutes as tolerated - until the full dose has been administered
Maintain low rate of infusion throughout if patient has acute renal disease, or thromboembolic disorders

Weight (kg)	First 30 minutes (ml/hour)	Second 30 minutes (ml/hour)	Third 30 minutes (ml/hour)	Fourth 30 minutes (ml/hour)	Maximum rate (ml/hour)
Â	0.5ml/kg/hour	1ml/kg/hour	2ml/kg/hour	4ml/kg/hour	6ml/kg/hour
50	25	50	100	200	300
55	27.5	55	110	220	330
60	30	60	120	240	360
65	32.5	65	130	260	390
70	35	70	140	280	420
75	37.5	75	150	300	450
80	40	80	160	320	480
85	42.5	85	170	340	510
90	45	90	180	360	540
95	47.5	95	190	380	570
100 (max weight to use for RATE calculations*)	50	100	200	400	600

Rates above are for most patients. Patients with Primary immunodeficiency may tolerate up to 8ml/kg/hour
*** max 100kg used to calculate dose RATE** - based on requirement not to overload heavy patients with high rate of large volume infusions

Dose in adults

Important points [ref 2]

- Use Online Dosage Calculator and Order Form
- Using this adjusted weight dose may contribute to minimisation of side-effects such as thrombosis, renal failure and infusion rate-related reactions. It will also save significant quantities of immunoglobulin for patients who need it most.

Measles prophylaxis [ref 3](see NIAC Immunisation Guidelines, Chapter 12, Measles)

- Give 0.4g per kg stat
- For example 0.4g per kg for patient who weighs 65kg is 26g - give 25g (2x10g vials + 5g vial)
- If there is significant ongoing or re-exposure to measles following the administration of IVIG, the administration should be repeated at three weekly intervals

Replacement therapy in primary immunodeficiency syndromes

- 0.4 to 0.8g per kg as starting dose, followed by 0.2 to 0.8g per kg every three to four weeks
- Three to six months are required after the initiation of therapy for steady-state IgG levels to occur
- Desired trough levels (taken before the next infusion) are at least 5 to 6g/L

Replacement therapy in secondary immunodeficiency

- Usual dose 0.2 to 0.4g per kg every three to four weeks
- IgG trough levels should be measured and assessed in conjunction with the incidence of infection.
- Dose should be adjusted as necessary to achieve optimal protection against infections, an increase may be necessary in patients with persisting infection; a dose decrease can be considered when the patient remains infection free

Primary immune thrombocytopenia

- **Treatment**: either 0.8g to 1g per kg on day one, which may be repeated once within three days,
- **or** 0.4g/kg daily for two to five days
- Treatment may be repeated if relapse occurs

Guillain Barre syndrome

- 0.4g per kg daily for five days
- possible repeat of dosing in case of relapse

Chronic Inflammatory Demyelinating Polyneuropathy (CIDP)

- **Starting dose:** Give 2g/kg given over two to five days .(example 1g/kg daily for two days, or 0.4g/kg daily for five days)
- **Maintenance dose:** Give 1g/kg given over one to two days, every three weeks

Multifocal Motor Neuropathy (MMN)

- **Starting dose:** Give 2g/kg given over two to five days (example 1g/kg daily for two days, or 0.4g/kg daily for five days)
- **Maintenance dose:** Give 1g/kg every two to four weeks, **or** 2g/kg every four to eight weeks over 2 to 5 days
- Treatment effect should be evaluated after each cycle. If no response after six months, then treatment should be discontinued

See SPC or Australian guidelines for other indications

Monitoring

- Patients must be **closely monitored** and carefully observed for any adverse reactions throughout the infusion period and for at **least 20 minutes** after administration
- Monitoring should be **extended to 60 minutes** for immunoglobulin naive patients, those switched from another product, or when there has been a long interval since previous infusion
- **Certain adverse reactions** (e.g. headache, flushing, chills, myalgia, wheezing, tachycardia, lower back pain, nausea, and hypotension) **may be related to the rate of infusion**
- If adverse reactions occur, slow or stop the infusion - see under 'Further information'. Please also consult Medication Protocol: Management of Infusion Related patient reactions in nurse led infusion settings in GUH -available on Q pulse (CLN-NM-0118)
- Ensure the following when administering IVIG
  - adequate hydration prior to the initiation of the infusion of IVIg
  - monitoring of urine output
  - monitoring of serum creatinine levels
  - monitoring for signs and symptoms of thrombosis
  - assessment of blood viscosity in patients at risk for hyperviscosity
  - avoidance of concomitant use of loop diuretics

Further information

- **Management of infusion related reactions:** depending on the severity of the reactions, the infusion rate may either be **slowed or stopped**
- Some cases of **acute renal failure** have been reported in patients receiving IVIG
  - This is particularly those containing sucrose as an excipient (Kiovig does not contain sucrose)
  - administer at the minimum rate of infusion and dose practicable for patients at risk for acute renal failure
- IVIG may interfere with response to **live vaccines** - serological testing may be necessary - see SPC
- At least 98% of Kiovig is immunoglobulin G (IgG)
- Maximum IgA content is 140 microgram per ml
- Contains glycine as an excipient
- If dilution to a lower concentration is required, Kiovig may be diluted with Glucose 5% to a final concentration of 50mg/ml (5%). Example: Mix 50ml Kiovig 10% solution with 50ml Glucose 5% (may result in increased blood glucose levels)

Storage

- Store below 25^{o}C, do not freeze

References

SPC Kiovig 100mg/ml 24/06/2022

1. Communication with Dr Tormey, Immunologist, by email March 2011

2. Department of Health Clinical Guidelines on the use of Intravenous Immunoglobulins 2011 Second edition update

3. NIAC immunisation guidelines Measles Prophylaxis- see page 19

Therapeutic classification

Intravenous immunoglobulin