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Synergistic Gentamicin for Endocarditis in Adults

(Ref. NHS Greater Glasgow and Clyde Guidelines 2016 approved by Scottish Antimicrobial Prescribing Group October 2016.

All patients with suspected or proven endocarditis should be discussed with microbiology. Synergistic gentamicin is recommended in initial treatment of native valve endocarditis due to enterococcal and streptococcal species and in prosthetic valve endocarditis of all aetiology including staphylococci. Therapy should be discussed with an infection specialist and consider resistance, clinical response, toxicity and need for outpatient therapy.

Dosage Guidelines

These guidelines aim to produce a 1 hour post dose peak of 3-5 mg/L and a trough of <1mg/L. Doses should be administered by IV bolus injection over 3-5 minutes.

Gentamicin Synergistic Dosing Guidelines	**Patient Weight**				
Actual body weight/Creatinine CL	**<45kg**	**45-65kg**	**66-85kg**	**86-110kg**	**>110kg**
<25ml/min	40mg	60mg	80mg	100mg	120mg
	Take a sample after 24 hours. Do not give a further dose until the concentration is <1mg/L				
25-44ml/min	40mg 24 hourly	60mg 24 hourly	80mg 24 hourly	100mg 24 hourly	120mg 24 hourly
>44ml/min	40mg 12 hourly	60mg 12 hourly	80mg 12 hourly	100mg 12 hourly	120mg 12 hourly

Prescribing

Prescribe on drug kardex; do **not** use the gentamicin prescribing, administration and monitoring form to prescribe synergistic gentamicin.

Monitoring

1. Take a blood sample for gentamicin analysis one hour after the first gentamicin bolus injection has been administered ("peak" sample). At the first dose, the concentration may not yet be at steady state, and any repeat peak concentration measurements may be higher than the first. Record the exact time of ALL gentamicin samples on the sample request form
2. Take a second blood sample for gentamicin analysis at the end of the first dosage interval (trough concentration) then give the next dose. Do not delay giving the second gentamicin dose while waiting for trough concentration to be reported unless there are concerns over deteriorating renal function.
3. If the gentamicin peak concentration is within the range of 3-5mg/L and the gentamicin trough is <1mg/L, continue the present dosage regimen.
4. Seek advice from Pharmacy if you are unsure how to interpret the results or if the concentrations are not within the target ranges above
5. If the gentamicin trough concentration is >1mg/L and a further dose has already been administered, reanalyse the trough and await the result before redosing. Do not give a further dose until the gentamicin concentration is <1mg/L.
6. Monitor the patient's creatinine daily. If renal function is stable, check the gentamicin trough concentration every 2 days. If renal function deteriorates, or if the concentrations measured are not within the target range. Check the trough concentration daily and discuss dose regimen with pharmacy.

Gentamicin Duration

Seek Microbiology advice.

Toxicity

Gentamicin can cause renal and ototoxicity. The risk of gentamicin toxicity increases with duration of therapy. The addition of gentamicin in staphylococcal native value infective endocarditis (IE) is no longer recommended because it increases renal toxicity.

Renal Toxicity

- Monitor creatinine daily. Seek advice if renal function is unstable (e.g. a change in creatinine of >15-20%)
- Signs of renal toxicity include an increase in creatinine or decrease in urine output/oliguria.
- Consider an alternative agent if creatinine is rising or the patient becomes oliguric.

Ototoxicity

- Ototoxicity secondary to gentamicin is independent of drug concentration. It is suggested by any of the following: new tinnitus, dizziness, poor balance, hearing loss or oscilliating vision.
- Toxicity is associated with prolonged aminoglycoside use (usually >10 days but may be >72 hours) and is secondary to drug accumulation within the inner ear. If gentamicin continues for >7d the patient should be referred to audiology for ongoing audiometry testing.
- Patients prescribed gentamicin should be advised to report signs of ototoxicity (patient information cards are available from BGH Pharmacy). They should be asked about any signs and symptoms of ototoxicity regularly and this should be documented in the case notes.
- Stop treatment if ototoxicity is suspected and refer to a microbiology/infection specialist for advice on future therapy.