Pharmacogenomics: Considerations for aminoglycoside prescribing

AMT Network Event
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Pharmacogenomics

the influence of genes on an individual's response to medicines
Clinical applications

- Stroke medicine - clopidogrel
- Cancer chemotherapy - DPYD
- Companion diagnostics - siponimod
Key considerations for implementation

- Testing strategy – who, when, how
- Equitable access to testing
- Workforce development
- Governance/policy
- Integration of genomics data with clinical systems
- Patient engagement/information needs
The aminoglycoside story........

MHRA Drug Safety Update – Jan 2021; “Aminoglycosides: increased risk of deafness in patients with mitochondrial mutations”

m.1556G>A and ↑ risk of sensorineural deafness

Risk vs benefit – implications for clinical practice.
The m.1555G>A mutation

- Mitochondrial DNA mutation (mtDNA)
- Mutated ribosome resembles bacterial ribosome, offering binding site for AG & ↑ risk
- Most common – affects ~0.2% population
- Associated with SNHL, risk ↑ with aminoglycoside exposure
- One of at least 5 identified – association with SNHL of ototoxicity
Implications for clinical practice

Who?

What?

When?

Why?

How?

Where an aminoglycoside is required in the management of acute or life threatening infection, treatment must not be delayed.
New rapid genetic test could prevent antibiotic-related hearing loss in newborns