

The role of bioanalytical CROs in therapeutic drug monitoring

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Outline



- Bioanalytical CROs explained
- Background of Therapeutic Drug Monitoring (TDM)
- The connection - Bioanalytical CROs in TDM
- Case Study

Bioanalytical CROs



➤ Bioanalytical CROs

- Expertise in the quantitative analysis of drugs in biological matrices
- Support the drug development process
- Specialise in the production of high quality methods
- Continuously invest in new technology
- Can support the diverse new chemical entities that are being generated



Picture produced by LGC

Therapeutic Drug Monitoring

Therapeutic drug monitoring (TDM) can be:

- Clinical effect (lowering blood pressure)
- Biochemical effect (pharmacodynamics)
- Drugs plasma concentration (pharmacokinetics)

TDM is typically performed for:

- Drugs that have a narrow therapeutic window
- Drugs with marked individual variability in metabolism
- Drugs with adverse effects that are difficult to distinguish from the disease itself

Examples of drugs: Digoxin, Cyclosporin

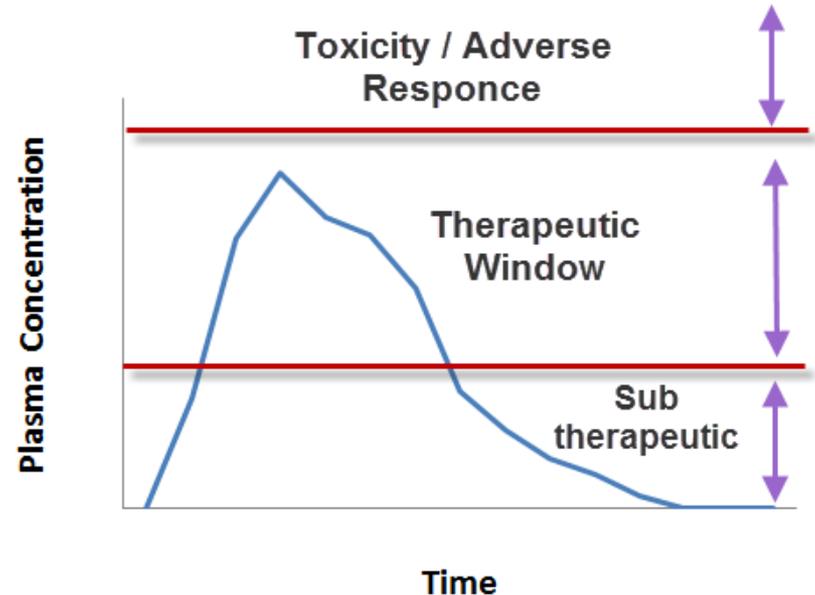


Figure produced by LGC

Therapeutic Drug Monitoring



Requirements for reliable TDM:

- Appropriate sampling techniques and times
- Stability of drug in biological matrix
- Reliable assay capable of quick turnaround of results
- Good collaboration between scientists, clinicians and hospital staff

Benefits from TDM:

- Avoid toxicity
- Optimise individual patient's dosing regime
- Identify drug-drug interactions
- Monitor compliance
- Guiding withdrawal of therapy



Bioanalytical CROs and TDM



TDM can also be performed by CROs in cases where:

- TDM is required on emerging drugs not yet on the market but that have been granted authorisation to be used in special cases of medical need.
 - If Bioanalytical CRO has performed the phase I analysis of an emerging drug, it will hold a fully validated method for the compound and as such have pre-established expertise to support the TDM
- Clinical laboratories do not hold the required equipment to develop a method for the quantitation of a compound and achieve the required levels of detection, accuracy or selectivity.
 - Bioanalytical CROs have a portfolio of multiple instrument types

Bioanalytical CROs and TDM



TDM can also be performed by CROs in cases where:

- Clinical laboratories cannot meet the required timelines of analysis especially when assays are required for special cases but instrumentation is set up for more routine TDM analysis.
 - New technology used by CROs supports the development of quick assays
- Multiple compounds need to be monitored in a single sample via several assays simultaneously
 - Multiple instruments available in a bioanalytical laboratory

Case Study

Patient Treatment – Plasma concentration monitoring



Background



- Patient in a serious life threatening condition in hospital
- Special authorisation to give an anti-viral drug investigated for the treatment of life-threatening infections - no alternative treatments
- First patient treated - PK samples taken to determine exposure and adjust the dose
- This request was extremely time sensitive

Timelines – 5 hours!

- Validated assay from supporting phase I clinical trial
 - Virus inactivation
- Shipments arranged and first 5 samples arrived at 10:30 (Day 1)
 - Data sent at 16:00 (Day 1)
- Second set of samples arrived at 18:00 (Day 1)
 - Data sent at 15:00 (Day 2)
- Third set of samples arrived at 13:00 (Day 3)
 - Data sent at 17:45 (Day 3)

Feedback/Results



Clinician: “Due to the lack of information regarding drug dosing in renal impairment, the real-time PK data that you provided on clinical samples was an essential component of clinical care and I am very grateful for your support with this.”

Due to confidentiality, treatment results were not shared however, there was another patient a few months later and the same approach was taken with LGC also analysing those samples to support clinical care.

Conclusions

- Emerging drug TDM - Fully validated assays at CROs
- Assays meet TDM criteria; Fast, Reliable, Accurate
- Multiple and varied instrumentation available
- Real time impact on patients treatment

Thank you

