Therapeutic Drug Monitoring of Tyrosine Kinase Inhibitors: Key to personalized medicine in Oncology

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**Background**
- Tyrosine Kinase Inhibitors (TKIs) are increasingly used as oral targeted therapies in Oncology.
- The oral route leads to a high interindividual pharmacokinetic variability.
- To improve efficacy and/or reduce toxicity, Therapeutic Drug Monitoring (TDM) can be used to adapt doses and personalize treatments.

**Design**
- Retrospective study
- January 2018 to October 2018 including patients treated for solid tumors with TKIs
- Blood samples were collected and analyzed to determine TKIs trough plasma concentrations
- 3 to 15 days after administration depending on the TKI (necessary time to reach targeted steady state).

**Aim of study**
To assess the potential impact of TDM on clinical decision in patients treated with TKIs

**Evaluation criteria**
- Patients' plasma exposure
- Therapeutic approach
- Tolerance
- Progression if applicable

**Results/Discussion**
- **73 Blood samples**
- **45 Patients**

<table>
<thead>
<tr>
<th>Anti-EGFR drugs</th>
<th>Plasma trough concentration</th>
<th>Infratherapeutic concentrations</th>
<th>Therapeutic concentrations</th>
<th>Supratherapeutic concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>26% (19/39)</td>
<td>62% (44/73)</td>
<td>12% (9/73)</td>
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</tbody>
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<thead>
<tr>
<th>Anti-CDK4/6 drug</th>
<th></th>
<th>47% (9/19) : treatments pursuit without any modification</th>
<th>72% (32/44) : treatments pursuit and 2 with dosage adjustment</th>
<th>78% (7/9) : dose reduction</th>
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<tr>
<td></td>
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<td>30% (6/19) : change of drug</td>
<td>22% (10/44) : change of drug</td>
<td>22% (2/9) : stop of the treatment</td>
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<tr>
<th>Anti-VEGFR drugs</th>
<th></th>
<th>Well tolerated 2 patients : 1-2 toxicity's grade</th>
<th>7 patients : adverses effects</th>
<th>4 patients : 1-2 toxicity's grade</th>
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<tbody>
<tr>
<td>Cabozantinib</td>
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<td>Nintédanib</td>
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<td>Pazopanib</td>
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<td>Regorafenib</td>
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<td>Sunitinib</td>
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**Conclusion**
- TDM could help in daily clinical decision along with other clinical data.
- TDM helped us:
  - To detect supratherapeutic exposure and reduce toxicity,
  - Uncover drug interactions
  - Optimize patient management to improve clinical outcomes.

References
1. PMID: 24878063
2. PMID: 27446421
3. PMID: 24041628