Interpretation of oxycodone concentrations in oral fluid

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Introduction
- The number of testing laboratories offering the analysis, in urine, of prescription pain medications has increased over the last few years, along with the overuse and abuse of pain killing drugs, specifically oxycodone. The use of oral fluid for this purpose is becoming increasingly popular.
- **Oral fluid (OF) advantages:**
  - rapid & easy to collect
  - difficult to adulterate
  - reflects free drug circulating in blood
  - better correlation with blood concentrations than urine results

Methods
- Paired blood and OF specimens were retrospectively studied in an attempt to establish a range for oxycodone concentrations in OF reflective of therapeutic intake
- Twenty-three OF: blood pairs
- OF collected in the Quantisal™ device
- Blood specimens collected simultaneously in grey-top tubes
- Analysis: LC-MS/MS

Results
- Blood concentrations were converted to plasma levels
- Whole blood: plasma ratio (WB: P) for oxycodone = 1.3
- **Median OF concentration:** 524µg/L
- **Median blood concentration:** 53µg/L
- **Median plasma concentration:** 41µg/L
- Projected S: P ratio = 12

Discussion
- Fatal post-mortem blood levels of oxycodone average 1200µg/L (100 - 8000µg/L)
- Regardless of formulation, oxycodone plasma concentrations generally don’t exceed 100µg/L
- Based on therapeutic plasma concentrations, the corresponding OF concentration range would be 120 – 1200µg/L
- Five of 23 OF had concentrations >1200µg/L, indicating 22% of the samples may be considered outside the OF therapeutic range
- The corresponding plasma concentrations were 62 - 175µg/L, four of the five >100µg/L

Conclusion
- Relationship between plasma and OF concentrations for oxycodone was remarkably consistent: r² = 0.842
- Oxycodone is generally given in a sustained release formulation, so it is possible that equilibration between blood and saliva has time to occur, improving correlation
- Since oxycodone is an opioid with potential for the development of tolerance in chronic users, therapeutic ranges may be extended
- Comparing OF to blood concentrations allowed the projection of S:P ratios for oxycodone, and the development of a potential therapeutic range in oral fluid

Reference


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