

## **Post-mortem analysis of fentanyl after an overdose with more than 40 fentanyl patches**

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**Background** Fentanyl is a strong analgesic that is often misused which led to an increase in deaths, non-intentional as well as intentional. However, a fentanyl overdose is hard to recognize as cause of death while ante mortem plasma concentrations do not resemble post mortem concentrations. To gain more insight in how to interpret postmortem fentanyl concentrations we present a case of a patient that died of a clear fentanyl overdose by the use of an extensive amount of fentanyl patches.

**Case description** A 23-year old male was found death in his bedroom with on his body around 50 patches of fentanyl including 40 patches of 12.5 mcg/hour and 3 patches of 50 mcg/hour. Also, fentanyl tablets of 100 mcg and cocaine powder were found in his room which were possible taken by the deceased. The most likely cause of death was an intentional fentanyl overdose by cause of the patches. To confirm the cause of death, urine and subclavian blood were retrieved to perform a standard postmortem toxicology screening. The toxicological screening showed several drugs including cocaine, fentanyl, lidocaine and paracetamol. Further analysis with UPLC-MS/MS to determine quantitative postmortem values of fentanyl resulted in a concentration of 60 mcg/L. This concentration is higher than found in patients that died of a natural cause during the use of fentanyl patches. However, when looking at deaths caused by fentanyl overdose or mixed drugs overdose including fentanyl, the found concentration are mostly analyzed in femoral blood samples. Concentrations found in femoral blood in cases of overdoses are up to 150 mcg/L.

**Conclusion** Although an extensive amount of fentanyl patches was used that led to the death of a young male, only relatively low postmortem concentrations of fentanyl were found in subclavian blood compared to other postmortem cases. However, most of the cases are analyzed in femoral blood, the patches of fentanyl leading to the subclavian concentration of 60 mcg/l in this case seems to be the cause of death.