G117 Methadone and Cocaine Related Death in A Young Boy: A Case Report

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After attending this presentation, attendees will learn of the possibility of cases where a synergic effect of cocaine and methadone could be assumed as the cause of death.

This presentation will impact the forensic science community by the discussion regarding pharmacokinetic and pharmacodynamic drug interactions between cocaine and methadone.

Background and Learning Objective: In recent years, a significant increase in the number of fatal intoxications with methadone has been reported in Italy. The abuse of methadone is most frequently seen in conjunction with the abuse of other drugs. Cocaine and methadone are rarely co-intoxicants in cases of combined drug toxicity. The interpretation of blood methadone concentrations alone or combined with other psychoactive drugs requires careful and accurate consideration of the subject's potential chronic use of and tolerance to the drug. Moreover, determining the cause of death in methadone and cocaine positive cases requires a strong correlation with autopsy results and investigative findings. The goal of this study is to discuss the possible mechanisms and eventually the synergic effect of cocaine and methadone in causing the death of a young boy.

Case Report: A 15-year-old young man was found dead during the early morning in his bed at home. Police investigations ordered by the public prosecutor revealed that the young boy, the night before, had used cocaine and methadone for the first time.

Results: At the autopsy, lungs were edematous and congested with absence of major diseases. Main findings at the histological investigation were widespread myocardial interstitial edema and focal vascular congestion. Toxicological analysis detected cocaine, methadone, and related metabolites at the following concentrations. **Blood:** *benzoylecgonine* = 50 nanograms/ml; *cocaine*=40 nanograms/ml; *methadone*=274 nanograms/ml; EDDP = 166 nanograms/ml. **Urine**: *benzoylecgonine* = 9000 nanograms / ml, *cocaine* = 153 nanograms / ml *methadone* = 300 nanograms/ ml; *EDDP* = 200 nanograms/ml. Traces of cocaine were also found in the nasal mucosa.

Conclusions: It is well known in forensic field that it can be very difficult to determine what mechanism(s) are responsible for drug interactions especially in cases as such, where the deceased cannot be considered as habitual drug-user. Moreover, it should be taken into account that the presence of methadone is often an incidental finding during postmortem examination which is unrelated to the cause of death and that postmortem measurements of methadone or its metabolite cannot be used in isolation to identify which deaths are associated with methadone toxicity. Very little information is available from the literature regarding methadone-cocaine co-intoxications. In our case we can only hypothesize an interaction between these drugs on different organs, such as heart and central nervous system. Pharmacokinetic and pharmacodynamic drug interactions mechanism and the possible explanation in determining the cause of death in this case will be discussed.

Methadone, Cocaine, Synergic Effect

 ** Presenting Author*