NMS LABS

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CONFIDENTIAL

Toxicology Report

Report Issued 04/27/2015 16:00

To: 10362
Kern County Sheriff Coroner
1832 Flower Street

Bakersfield, CA 93305

Patient Name	LE MON MICHAEL E
Patient ID	C00696-15
Chain	34327
Age Not Given	DOB Not Given
Gender	Male
Workorder	15108101

Positive Findings:

Compound	Result	Units	Matrix Source
Caffeine	Positive	mcg/mL	001 - Femoral Blood
Delta-9 THC	2.9	ng/mL	003 - Hospital Blood
Delta-9 Carboxy THC	11	ng/mL	003 - Hospital Blood

See Detailed Findings section for additional information

Testing Requested:

Analysis Code	Description
8052B	Postmortem Toxicology - Expanded, Blood (Forensic)

Specimens Received:

ID	Tube/Container	Volume/ Mass	Collection Date/Time	Matrix Source	Miscellaneous Information
001	Gray Top Tube	11 mL	04/08/2015 07:25	Femoral Blood	DATE/TIME ON SAMPLE 4/9/15 1050
002	Gray Top Tube	10.5 mL	04/09/2015 10:50	Femoral Blood	
003	Red Vial	0.75 mL	04/08/2015 07:25	Hospital Blood	
004	Pink Vial	0.2 mL	04/08/2015 07:25	Hospital Blood	

All sample volumes/weights are approximations.

Specimens received on 04/14/2015.

Detailed Findings:

Analysis and Comments	Result	Units	Rpt. Limit	Specimen Source	Analysis By
Caffeine	Positive	mcg/mL	1.0	001 - Femoral Blood	LC/TOF-MS
Delta-9 THC	2.9	ng/mL	1.0	003 - Hospital Blood	GC-GC-GC/MS
Delta-9 Carboxy THC	11	ng/mL	5.0	003 - Hospital Blood	GC-GC-GC/MS

Other than the above findings, examination of the specimen(s) submitted did not reveal any positive findings of toxicological significance by procedures outlined in the accompanying Analysis Summary.

Reference Comments:

1. Caffeine (No-Doz) - Femoral Blood:

   Caffeine is a xanthine-derived central nervous system stimulant. It also produces diuresis and cardiac and respiratory stimulation. It can be readily found in such items as coffee, tea, soft drinks and chocolate. As a reference, a typical cup of coffee or tea contains between 40 to 100 mg caffeine.

   The reported qualitative result for this substance was based upon a single analysis only. If confirmation testing is required please contact the laboratory.

2. Delta-9 Carboxy THC (Inactive Metabolite) - Hospital Blood:

   Marijuana is a DEA Schedule I hallucinogen. Pharmacologically, it has depressant and reality distorting effects. Collectively, the chemical compounds that comprise marijuana are known as Cannabinoids.

   Delta-9-THC is the principle psychoactive ingredient of marijuana/hashish. Delta-9-carboxy-THC (THCC) is the inactive metabolite of THC with peak concentrations attained 32 to 240 minutes after smoking and may be detected for up to one day or more in blood. Both delta-9-THC and THCC may be present substantially longer in chronic users. THCC is usually not detectable after passive inhalation.

3. Delta-9 THC (Active Ingredient of Marijuana) - Hospital Blood:

   Marijuana is a DEA Schedule I hallucinogen. Pharmacologically, it has depressant and reality distorting effects. Collectively, the chemical compounds that comprise marijuana are known as Cannabinoids.

   Delta-9-THC is the principle psychoactive ingredient of marijuana/hashish. It rapidly leaves the blood, even during smoking, falling to below detectable levels within several hours. THC concentrations in blood are usually about one-half that of serum/plasma concentrations. The active metabolite, 11-hydroxy-THC, may also fall below detectable levels shortly after inhalation. Delta-9-carboxy-THC (THCC) is the inactive metabolite of THC with peak concentrations attained 32 to 240 minutes after smoking and may be detected for up to one day or more in blood. Both delta-9-THC and THCC may be present substantially longer in chronic users.

   Reported usual peak THC concentrations in serum after smoking 1.75% or 3.55% THC marijuana cigarettes are 50 - 270 ng/mL after beginning of smoking, decreasing to less than 5 ng/mL by 2 hrs. Corresponding delta-9-carboxy-THC concentrations range from 10 - 101 ng/mL about 32 to 240 minutes after the beginning of smoking and decline slowly. Passive inhalation of marijuana smoke has been reported to produce blood THC concentrations up to 2 ng/mL. Delta-9-carboxy THC concentrations in blood may not be present following passive inhalation of marijuana smoke.

Unless alternate arrangements are made by you, the remainder of the submitted specimens will be discarded one (1) year from the date of this report; and generated data will be discarded five (5) years from the date the analyses were performed.

Workorder 15108101 was electronically signed on 04/27/2015 15:15 by:

William H. Anderson

William H. Anderson, Ph.D., F-ABFT
Forensic Toxicologist

Analysis Summary and Reporting Limits:

All of the following tests were performed for this case. For each test, the compounds listed were included in the scope. The Reporting Limit listed for each compound represents the lowest concentration of the compound that will be reported as being positive. If the compound is listed as None Detected, it is not present above the Reporting Limit. Please refer to the Positive Findings section of the report for those compounds that were identified as being present.

Acode 50013B - Cannabinoids Confirmation, Blood (Forensic) - Hospital Blood

-Analysis by Multi-dimensional Gas Chromatography/Mass Spectrometry (GC-GC-GC/MS) for:

Compound	Rpt. Limit	Compound	Rpt. Limit
11-Hydroxy Delta-9 THC	5.0 ng/mL	Delta-9 THC	1.0 ng/mL
Delta-9 Carboxy THC	5.0 ng/mL		

Acode 8052B - Postmortem Toxicology - Expanded, Blood (Forensic) - Femoral Blood

-Analysis by Enzyme-Linked Immunosorbent Assay (ELISA) for:

Compound	Rpt. Limit	Compound	Rpt. Limit
Barbiturates	0.040 mcg/mL	Salicylates	120 mcg/mL
Cannabinoids	10 ng/mL		

-Analysis by Headspace Gas Chromatography (GC) for:

Compound	Rpt. Limit	Compound	Rpt. Limit
Acetone	5.0 mg/dL	Isopropanol	5.0 mg/dL
Ethanol	10 mg/dL	Methanol	5.0 mg/dL

-Analysis by High Performance Liquid Chromatography/ Time ofFlight-Mass Spectrometry (LC/TOF-MS) for: The following is a general list of compound classes included in this screen. The detection of any specific analyte is concentration-dependent. Note, not all known analytes in each specified compound class are included. Some specific analytes outside these classes are also included. For a detailed list of all analytes and reporting limits, please contact NMS Labs.
Amphetamines, Anticonvulsants, Antidepressants, Antihistamines, Antipsychotic Agents, Benzodiazepines, CNS Stimulants, Cocaine and Metabolites, Hallucinogens, Hypnosedatives, Hypoglycemics, Muscle Relaxants, Non-Steroidal Anti-Inflammatory Agents, Opiates and Opioids.

UHealth
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of MEDICINE

Name: Michael Le Mon **Kern County Coroner #** 696-15 Le Mon **UM Case:** HCCVC

Date of Death: 04/08/2015 **Time of Death:** 07:44 AM **Age:** 57 yrs

Sex: Male **Race:** Caucasian **Height:** 72 in. **Body weight:** 294 lbs

Consultant: Deborah C. Mash, Ph.D
Depts. Neurology and Molecular and Cellular Pharmacology
Miller School of Medicine at the University of Miami

Incident narrative summary: Report of a 57 year old Caucasian male who died following an altercation with law enforcement officers. [redacted] The decedant was known to have a psychiatric disability with a total of 58 calls made to the Kern County Sheriff's Office in the prior year reporting behavioral disturbances and complaints from neighbors. Mr. Le Mon suffered from Bipolar Disorder or possible schizoaffective disorder as reported by residents at the Lake Isabella RV Resort and Mobile Home Park, where he resided. He exhibited bizarre and paranoid behavior on many occasions in the past, that included verbal outbursts, yelling and screaming, hallucinations and threatening behaviors.

On 04/08/2015, police responded to a report of a peace disturbance between neighbors. They arrived at the scene at 06:29 hrs and attempted to arrest the decedent. Le Mon was oriented and recognized one of the arresting officers. However, Le Mon used his body weight to barricade himself in the residence to avoid arrest desipte the fact that he knew one of the officers at the scene. The officers upon entry to the residence asked Le Mon to leave the building and warned him that they would deploy their Taser if he did not comply. Le Mon was physically resisting and potentially violent at this point, failing to respond to verbal commands. A Taser was deployed striking Le Mon with one of two probes in his upper chest and the other in his abdomen. He was unaffected by this deployment and a second deployment was fired at this back. Both deployments were without effect.

The officer then sprayed oleoresin capsicum spray to Le Mon's eyes, but this was also without effect. He was again given orders to get on the ground and to quit resisting, but Le Mon failed to comply. He became aggressive with the officers and a second burst of oleoresin capsicum spray was used. At this point, he was forced to the ground by the officer. Le Mon punched one of the deputies in the face and he continued to resist arrest. He was impervious to pain of the Taser and oleoresin capsicum spray and he continued to resist arrest, struggling violently with the officers. Le Mon was eventually placed in handcuff restraints and he was transferred to the front walkway of the residence. Throughout this incident, Le Mon continued to resist the restraint measures. The officers requested medical assistance and it took rescue approximately 8 min to arrive at the scene. Le Mon continued to thrash his body from side to side. Shortly before fire rescue arrived, he told the officers that he was having difficulty breathing. He was maintained on his side and the officers checked his airway. When the medical personnel arrived he was not in visible distress and they prepared to transfer him to a gurney for transport to the hospital. Le Mon continued to resist the transfer and struggled with rescue personnel, until he went into cardiorespiratory arrest. He was pronounced dead at the Kern County Hospital. Postmortem blood toxicology was positive for Delta-9 THC and the metabolite Delta-9 Carboxy THC.

Brain Endowment Bank
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brainbank.med.miami.edu

2009). Regions-of-interest were dissected from the frozen specimen for neurochemical measures of the dopamine transporter (DAT) and heat shock protein 70 (HSPA1B) as a biomarker of hyperthermia. RNA was isolated from the cerebral cortex. The RNA integrity number (RIN) was 5.5. The RIN value, which serves as a RNA quality control measure was determined to be sufficient to proceed with brain biomarker analyses.

Biomarker Analyses: A neurochemical analysis of the number of dopamine transporters (DAT) was completed on this case. The density and affinity binding parameters were assayed within the ventromedial putamen using a selective radioligand and a validated neurochemical assay. Reference specimens were included in the assays for direct comparison to normalized values determined for control subjects and victims of excited delirium (Figure 1; left panel).

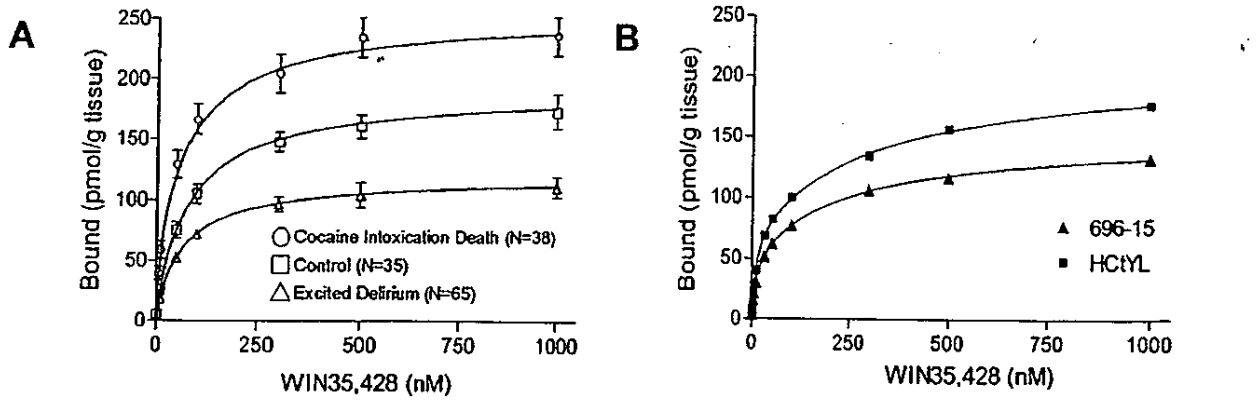

Figure 1: Equilibrium Saturation Binding of [^{3}H]WIN35,428. (A) Dopamine transporter reference values for cocaine intoxication deaths, age-matched drug-free controls and excited delirium cases for comparison (Mash et al., 2009). (B) The analytical results for Case #696-15 Le Mon as compared to an aged-matched control assayed in parallel (right panel).

The results show a decrease in the number of dopamine transporter sites for ME # 696-15 Le Mon. The qPCR analysis of Hsp70 mRNA demonstrated increased levels of transcript expression (average fold-change of 1.6; repeat run with duplicate samples; Table). This value was elevated compared to control values.

Table 1. Heat Shock mRNA (HSPA1B gene)

Subject/Cohort	Fold Change Range (vs. Controls)
Case# 696-15 Le Mon	1.6 ; 1.65 (repeat measures)
Excited Delirium (ExDS, n=80)	1.8 - 6.0
Reference Controls (n=80)	0.9 - 1.0

Previous studies have demonstrated that there is a defect in the regulation of the dopamine transporter in victims of excited delirium syndrome (Staley et al., 1994; 1995b; Wetli et al., 1996; Mash et al., 2002; 2009). Decreased number of dopamine transporters (DAT) in brain results in the loss of dopamine transport function in cases of excited delirium and sudden in custody death. High extracellular dopamine levels can exceed functional reuptake, which contributes to the psychotic behaviors (hyperdopaminergia) associated with the excited delirium syndrome (Staley et al, 1995; Mash et al, 2002; Mash et al., 2009).

Previous studies have demonstrated increases in heat shock protein (HSPA1B) expression levels (~ 2.0 fold-change) in brain specimens from subjects who had recorded elevations in core body temperature prior to death. Fever-like temperature causes a dramatic induction of hsp70 mRNA within 1 h in brain. Hyperthermia is a frequent harbinger of death in the excited delirium syndrome (ExDS). In this case, core body temperature was reportedly 97.7° C.

Excited Delirium Syndrome (ExDS) is a condition that manifests as a combination of psychomotor agitation, anxiety, hallucinations, speech disturbances, violent and bizarre behavior, insensitivity to pain, and increased strength. The disorder most frequently occures in male subjects, that had a history of psychostimulant abuse or possible mental health issues that were undiagnosed or not properly controlled with medication.

ExDS is often seen in persons with a large BMI. The decedent had a BMI of 39.9, which is in the range reported for obese individuals. He had a history of hypertension and diabetes which would be contributing factors in this case for risk of sudden death.

In conclusion, the dopamine transporter (DAT) levels were decreased and heat shock protein 70 (HSP70) was elevated compared to reference control values. These values are in agreement with values obtained for sudden death of persons with symptoms associated with the ExDS. The decedent was obese (BMI=39.9). The excited delirium signs and symptoms identified from the witness narratives are consistent with published studies of ExDS. When considered together with the circumstances prior to death, the results of the biomarker analysis support the assignment of ExDS as a contributing to the cause and manner of death for this decedent.

References

Mash DC, Pablo J, Ouyang Q, Hearn WL, and Izenwasser S. Dopamine transport function is elevated in cocaine users.*J. Neurochem.*, 81:292-300, 2002.

Mash DC, Duque L, Pablo J, Qin Y, , Adi N, Hearn WL, Hyma BA, Karch SB, Druid H and Wetli, CV. Brain biomarkers for identifying excited delirium as a cause of sudden death. *Foren. Sci. Int.*, 190(1-3), 2009.

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Vilke GM, DeBard ML, Chan TC, Ho JD, Dawes DM, Hall C, Curtis MD, Costello MW, Mash DC, Coffman SR, McMullen MJ, Metzger JC, Roberts JR, Sztajnkrcer MD, Henderson SO, Adler J, Czarnecki F, Heck J, Bozman WP. Excited Delirium Syndrome (ExDS): defining based on the review of the literature. J Emergency Medicine, 2011; doi: 10.1016/j.jemermed.2011.02.017.

Wetli CV, Mash DC, and Karch S. Agitated delirium and the neuroleptic malignant syndrome. *Amer. J. Emer. Med., 14*:425-428, 1996.