Examining the Relationship between Drug Use and Involvement in a Safety-Critical Event

A Pilot Study with Naturalistic Data

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Overview

- Background

- Pilot study to address two research questions
  - Prevalence of Rx and OTC drug use
  - Association between Rx and OTC drug use and involvement in a SCE

Methods: The Naturalistic Truck Driving Study

- 100 CMV drivers
- 4 weeks of participation
  - 2,867 SCEs
  - 5,069 baseline epochs
- Daily driver logbooks
  - Activities performed
  - Medication/caffeine use

Methods: Medication Coding

- Coded the following for each drug entry
  - Therapeutic class and classification
  - Rx or OTC
  - Absorption and half-life elimination rate
  - 1st through 7th half-lives
  - Adverse effects

Methods: SCE Risk Analysis

- Descriptive statistics
- Logistic regression models
  - Odds ratios and 95% confidence limits
  - Controlled for driver
  - Each half-life investigated separately

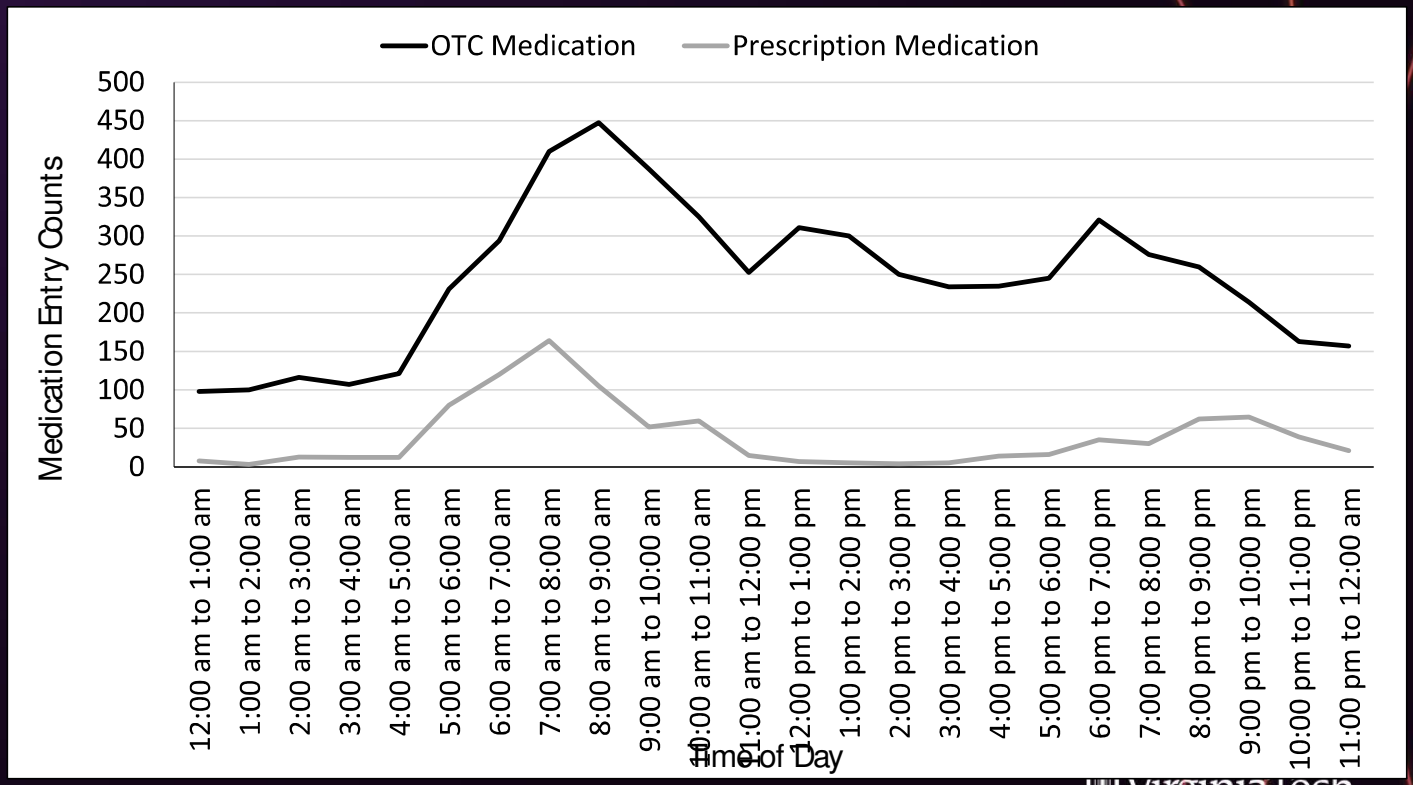
Prevalence of Drug Use

- 97 drivers completed logbooks
  - 94 reported OTC drug use
  - 26 reported Rx drug use
- 9,120 drug entries
  - 75.11% were OTC
  - 24.89% were Rx

Drug Classifications

Classification	Rx Percentage	OTC Percentage	Overall Percentage
Antihistamine	2.47%	1.58%	1.80%
Cardiac Meds	44.54%	0.39%	11.38%
Vitamin/Herbal Supplement	0%	13.99%	10.50%
Pain Meds	5.54%	5.78%	5.65%
Psychiatric Meds	9.74%	0%	2.42%
Sedative/ Hypnotics	1.45%	0.06%	0.41%
Caffeine	0%	78.57%	59.01%
Stimulant	3.44%	0.82%	1.47%
Other	39.74%	1.27%	10.84%
Unknown	0%	0.09%	0.07%

Time of Use


OTC Medication
Prescription Medication
Medication Entry Counts
500
450
400
350
300
250
200
150
100
50
0
12:00 am to 1:00 am
1:00 am to 2:00 am
2:00 am to 3:00 am
3:00 am to 4:00 am
4:00 am to 5:00 am
5:00 am to 6:00 am
6:00 am to 7:00 am
7:00 am to 8:00 am
8:00 am to 9:00 am
9:00 am to 10:00 am
10:00 am to 11:00 am
11:00 am to 12:00 pm
12:00 pm to 1:00 pm
1:00 pm to 2:00 pm
2:00 pm to 3:00 pm
3:00 pm to 4:00 pm
4:00 pm to 5:00 pm
5:00 pm to 6:00 pm
6:00 pm to 7:00 pm
7:00 pm to 8:00 pm
8:00 pm to 9:00 pm
9:00 pm to 10:00 pm
10:00 pm to 11:00 pm
11:00 pm to 12:00 am
Time of Day

Adverse Reactions

Impact Performance	Rx Percentage	OTC Percentage	Overall Percentage
Yes	61.23%	1.07%	16.04%
No	34.85%	98.93%	82.98%
Unknown	3.92%	0.00%	0.98%
Total	100.00%	100.00%	100.00%

- Dizziness most common for Rx drugs (44.27%)
- Drowsiness most common for OTC drugs (0.79%)

SCE Risk

	Half-Lives Odds Ratios						
	1st	2nd	3rd	4th	5th	6th	7th
Any Rx	0.6647	0.6222	0.6464	0.6425	0.6315	0.6428	0.7037
Any OTC	**0.6016***	**0.5664***	**0.5748***	**0.6182***	**0.5024***	**0.4590***	**0.6550***
Performance deteriorating drugs	0.7318	0.6447	0.6940	0.6842	0.6787	0.6430	0.8639
Non-performance deteriorating drugs	**0.5720***	**0.5296***	**0.5568***	**0.5903***	**0.5027***	**0.4520***	**0.5548***
Caffeine	**0.6204***	**0.5818***	**0.5745***	**0.6572***	**0.5076***	**0.4385***	0.6287

Odds ratios with an * and in bold are statistically significant

Conclusions and Summary

- Possible to use naturalistic data to investigate risk associated with Rx and OTC drug use
- Small sample of drivers using same medications
- Caffeine users were half as likely to be involved in an SCE compared to non-caffeine users
- Caffeine short-term countermeasure to fatigue

Questions?

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