The MA Data Project

Impact of Amphetamine Type Stimulant Use on Clinical Outcomes in OTP Clients

Background

- A significant proportion of OAT clients use ATS
- Evidence suggests stimulant use leads to poorer OAT outcomes
  - Cocaine use among methadone clients associated with poorer treatment retention and more heroin use
  - ATS use associated with greater social dysfunction and poorer psychological health
- No studies have examined how ATS use at the beginning of treatment affects clients' response to treatment over time

Research Question

What is the impact of ATS use on clinical outcomes in Opioid Treatment Program clients, specifically in relation to changes in substance use, health and wellbeing, extracted from CHOC data?

Research Question

Does frequency of ATS use at treatment entry have an impact on one-year treatment outcomes?

Methods

- Used routinely collected ATOP data: July 2016-June 2019
- Emulated a longitudinal cohort design
- Participants were clients entering OAT in any of six LHDs
- Used mixed effects models for repeated measures regressions to test whether the **rate of change** in various important clinical outcomes over time differed based on the frequency of clients' ATS use in the 28 days prior to starting a new treatment encounter
- ATS Use at assessment split into **No Use** (0 days in previous 28), **Low Use** (1-12 days), and **High Use** (13-28 days)
- Seven outcomes tested: ATS, Opioid, cannabis, and alcohol use, psychological health, physical health, Quality of Life

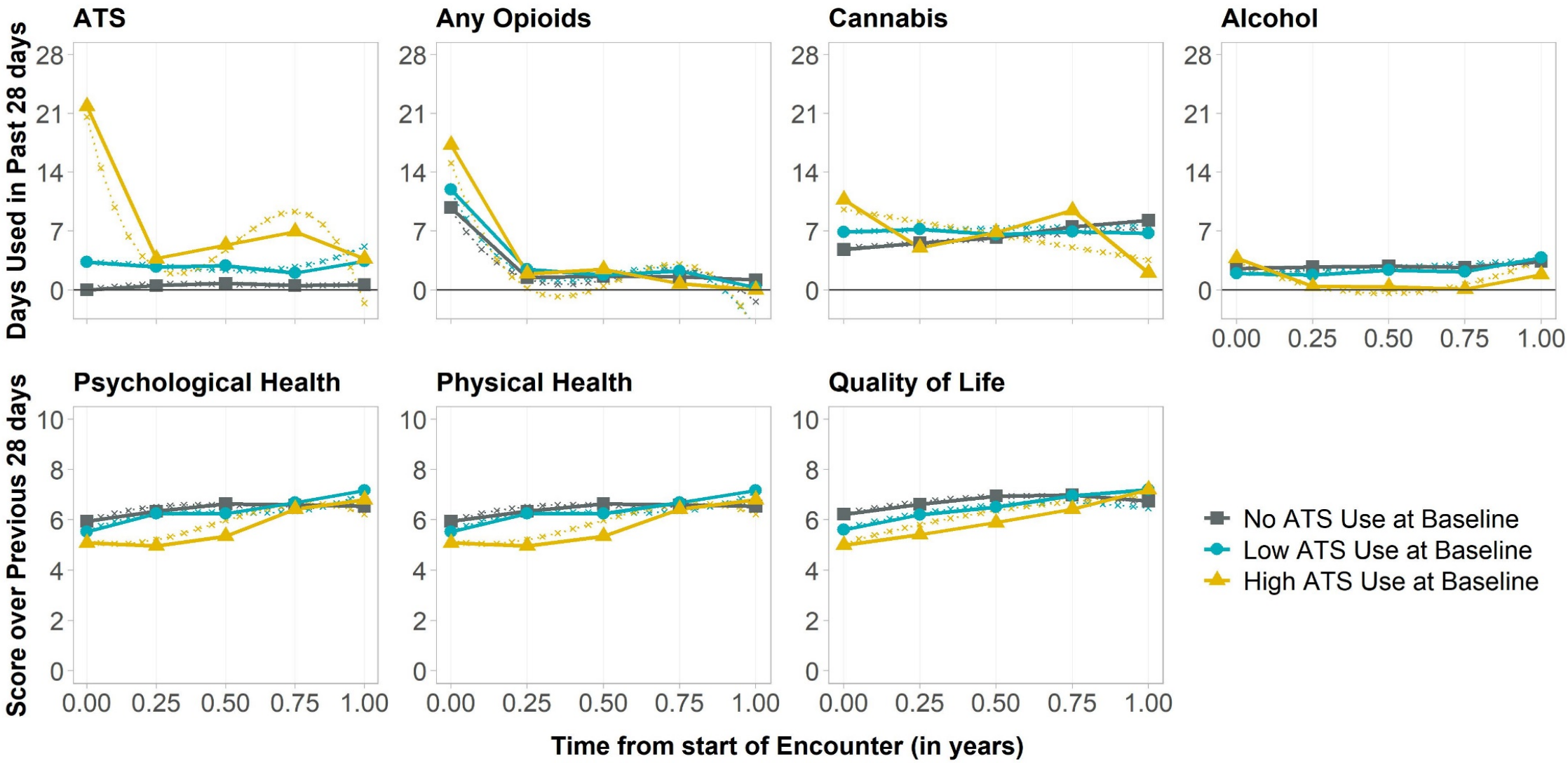
Criteria for Data Inclusion

Criterion	*N*
OAT clients in LHDs with Cerner eMR	3416
Data from clients with more than one ATOP	2267
Data from encounters whose duration is greater than 28 days	1000
Data from clients with valid ATS Use measurement at baseline	951
Data from ATOPs occurring within 365 days from start of treatment encounter	920

Results: Numbers in each group at various time points

Days of ATS Use in 28 days prior to baseline	Months from Start of Encounter				
	Start of Treatment	1-3 months *n* (%)	3-6 months *n* (%)	6-9 months *n* (%)	9-12 months *n* (%)
None (0 days)	708	518 (73%)	456 (64%)	347 (37%)	271 (26%)
Low (1-12 days)	185	160 (86%)	114 (62%)	84 (45%)	54 (29%)
High (13-24 days)	27	26 (96%)	26 (77%)	15 (58%)	11 (42%)
Total	920	704 (77%)	596 (65%)	446 (48%)	336 (37%)

Results: Change in substance use, health, and wellbeing



Results: Group differences in substance use

	Baseline		6 months		12 months	
	Days Difference (CI)	*p*	Days Difference (CI)	*p*	Days Difference (CI)	*p*
ATS[3]						
No ATS vs Low ATS	-3.2 (-3.8, -2.6)	**<.0001**	-1.7 (-2.4, -1.0)	**<.0001**	-4.4 (-6.6, -2.1)	**<0.0001**
No ATS vs High ATS	-20.6 (-21.2, -19.4)	**<.0001**	-4.1 (-5.6, -2.6)	**<.0001**	2.4 (-1.4, 6.2)	0.808
Low ATS vs High ATS	-17.3 (-18.9, -15.8)	**<.0001**	-2.4 (-4.0, -0.8)	**0.001**	6.8 (2.5, 11.0)	**0.001**
Opioid[3]						
No ATS vs Low ATS	-2.2 (-3.8, -0.5)	**0.005**	-0.7 (-2.6, 1.1)	0.631	1.9 (-4.4, 7.0)	0.852
No ATS vs High ATS	-5.8 (-9.7, -1.9)	**0.001**	0.9 (-2.9, 4.7)	0.848	2.7 (-8.6, 12.3)	0.911
Low ATS vs High ATS	-3.7 (-7.7, 0.4)	0.090	1.6 (-2.5, 5.6)	0.623	0.8 (-11.0, 12.0)	0.994
Cannabis[1]						
No ATS vs Low ATS	-1.9 (-3.8, -1.0)	**0.034**	-1.2 (-3.2, 0.9)	0.376	-0.4 (-3.7, 2.9)	0.956
No ATS vs High ATS	-4.5 (-7.4, -1.1)	**0.034**	-0.4 (-5.1, 4.2)	0.976	3.7 (-3.6, 11.0)	0.451
Low ATS vs High ATS	-2.6 (-5.2, 1.5)	0.358	0.8 (-4.2, 5.7)	0.931	4.1 (-3.6, 11.9)	0.422
Alcohol[2]						
No ATS vs Low ATS	0.7 (-0.5, 1.8)	0.368	-0.2 (1.5, 1.1)	0.947	-0.3 (-3.2, 2.7)	0.975
No ATS vs High ATS	-0.7 (-0.2, 1.7)	0.805	2.9 (0.0, 5.8)	**0.048**	-0.4 (-6.7, 6.0)	0.989
Low ATS vs High ATS	-1.4 (-4.3, 1.5)	0.490	3.1 (0.0, 6.1)	**0.048**	-0.1 (-6.9, 6.7)	0.999

Scale 0-28. Superscripts indicate maximum order of polynomial in the retained model: 1 = linear, 2 = quadratic, 3 = cubic

Results: Group differences in health and wellbeing

	Baseline		6 months		12 months	
	Days Difference (CI)	*p*	Days Difference (CI)	*p*	Days Difference (CI)	*p*
Psychological Health[3]						
No ATS vs Low ATS	0.4 (-0.0, 0.8)	0.063	0.3 (-0.1, 0.7)	0.253	-0.4 (-1.7, 0.9)	0.770
No ATS vs High ATS	0.7 (-0.2, 1.7)	0.158	0.6 (-0.3, 1.5)	0.237	0.5 (-1.9, 2.8)	0.891
Low ATS vs High ATS	0.4 (-0.6, 1.4)	0.676	0.3 (-0.6, 1.3)	0.715	0.8 (-1.8, 3.5)	0.725
Physical Health[3]						
No ATS vs Low ATS	0.3 (-0.1, 0.5)	0.173	0.1 (-0.2, 0.5)	0.750	0.1 (-0.9, 1.2)	0.954
No ATS vs High ATS	0.2 (-0.5, 0.8)	0.800	0.6 (-0.2, 1.2)	0.217	-0.1 (-2.1, 1.9)	0.922
Low ATS vs High ATS	-0.1 (-0.7, 0.6)	0.987	0.5 (-0.4, 1.1)	0.438	-0.3 (-2.4, 1.9)	0.978
Quality of Life[2]						
No ATS vs Low ATS	0.6 (0.2, 1.0)	**0.001**	0.3 (-0.1, 0.7)	0.109	0.2 (-0.7, 1.5)	0.877
No ATS vs High ATS	1.2 (0.2, 2.1)	**0.008**	0.6 (-0.3, 1.4)	0.240	-0.2 (-2.1, 1.7)	0.954
Low ATS vs High ATS	0.6 (-0.4, 1.6)	0.341	0.2 (-0.7, 1.1)	0.821	-0.4 (-2.5, 1.6)	0.872

Scale 0-10. Superscripts indicate maximum order of polynomial in the retained model: 1 = linear, 2 = quadratic, 3 = cubic

Conclusions

- Our findings suggest:
  - OAT Clients who use amphetamines when they start treatment also tend to use more opioids and cannabis than non-users
  - **BUT**, their use of these substances tends to reduce within the first year of treatment, to the point where, at 12 months, it is no higher on average than people who were not using amphetamines at the start of treatment.
  - Quality of life of OAT clients who use amphetamines is poorer at start of treatment than that of people using who do not use amphetamine
  - **BUT** that these differences also subside over time until, like substance use, there is little difference between groups by the end of a year's treatment.

Conclusions

- Our findings suggest:
  - Opioid agonist treatments are associated with **global reductions** in opioid and cannabis use – as well as amphetamines, and improvements in general health and wellbeing.
  - Although using amphetamines is associated with greater use of other substances and poorer quality of life Providing they stay in treatment, the prognosis for clients who are using amphetamines at baseline is not significantly worse than for the clients who are not.
  - The fact that treatment is associated with similar outcomes for all clients, regardless of their use of ATS at start of treatment, is very encouraging.

Limitations

- Analyses were restricted to one fairly simple, time-invariant predictor: ATS use at start of treatment.
  - Access to more predictors (e.g. data about the treatment provided to each client) will allow us to build better models.
  - Given the versatility of these models and the number of untapped sources of treatment and outcomes data in electronic medical records, the potential for us to obtain answers to questions of real clinical importance is enormous.
- The number of OTP clients who had high levels of ATS use was quite low
  - 27 at start of treatment. 11 with ATOP from 9-12 months.
  - More ATOPs more often

Future Directions

- treatment retention
- Add time-varying ATS use?