Pharmacological treatment in prisoners with ADHD –
Findings from Sweden

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Why bother about ADHD in prisoners?

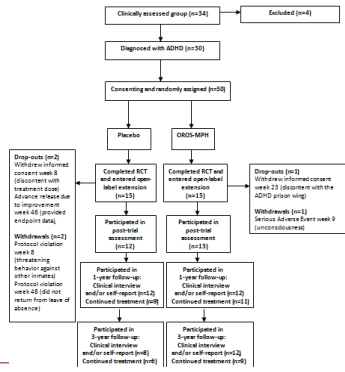
- ADHD is common in prisoners and usually unrecognised/untreated
- More coexistent disorders
- ↑ violent offences, aggression
- Difficult to manage
- Costly to rehabilitate
- Methylphenidate first-line drug treatment for ADHD
  - →Despite high ADHD rates, mph was not evaluated until recently in prison inmates

A randomised, double-blind, placebo-controlled trial of OROS-MPH with open-label extension and long-term follow-up

Prison inmates with ADHD were severely symptomatic and functionally impaired (n=30)

- Comprehensive assessments confirmed ADHD (combined)
- Males, 21-61 years, long-term convicts, violent or drug-related offences
- Learning disabilities, low educational level
  - →Estimated IQ, M = 95.18 ± 9.99 (78 –113)
- 100% lifetime substance misuse (not currently ongoing)
- ~25% autism spectrum disorder
- ~10% psychopathy according to definition by Hare
- ~50% medicated for depression and/or anxiety disorders
- Baseline: Severely symptomatic and functionally impaired (mean value/maximum value): CAARS:O-SV (40.0/54), ASRS (55.3/72), GAF (35.2/100), CGI-S (5.9/7)

Flow chart of trial and follow-ups



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Methylphenidate treatment of adult male prison inmates with attention-deficit hyperactivity disorder: randomised double-blind placebo-controlled trial with open-label extension

Ylva Ginsberg and Nils Lindefors

Background
Attention-deficit hyperactivity disorder (ADHD) is highly prevalent in prison inmates, but pharmacological treatment has not yet been evaluated in this group.

Results
Treatment significantly improved ADHD during the trial ($P<0.001$; Cohen's $d=2.17$), with reduced symptom severity and improved global functioning. The placebo

Treatment was highly effective
(Ginsberg & Lindefors, Br J Psych, 2012, 200: 68-73)

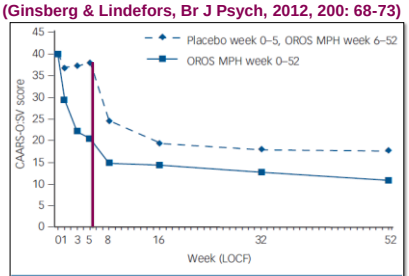

Fig. 2 Intention-to-treat population: Conners' Adult ADHD Rating Scale – Observer: Screening Version (CAARS-O:SV) total sum-score as a function of treatment group and time.

Randomised controlled trial: week 0–5; open-label extension: week 6–52. OROS-MPH, osmotic-release oral system methylphenidate; LOCF, last observation carried forward.

ADHD symptoms, global severity and functioning improved with large effect sizes (Ginsberg & Lindefors, Br J Psych, 2012, 200: 68-73)

Efficacy measures	OROS-MPH (n=15)	Placebo (n=15)	P-value	Effect size, Cohen´s *d*
CAARS-O:SV, mean (95% CI), baseline	40.0 (37.5 to 42.5)	39.9 (36.9 to 43.0)		
Change 0-5w (RCT)	19.6 (14.7 to 24.5)	1.9 (-0.4 to 4.2)	<0.001	**2.17**
ASRS, mean (95% CI), baseline	53.9 (49.0 to 58.7)	56.7 (51.7 to 61.8)		
Change 0-5w (RCT)	17.1 (9.5 to 24.4)	2.1 (0.02 to 4.1)	0.003	1.67
GAF, mean (95% CI), baseline	33.9 (31.2 to 36.6)	36.5 (33.6 to 39.3)		
Change 0-5w (RCT)	21.3 (14.8 to 27.9)	2.9 (0.3 to 5.5)	0.004	1.62
CGI-S, mean (95% CI), baseline	6.1 (5.8 to 6.3)	5.7 (5.4 to 6.1)		
Change 0-5w (RCT)	2.0 (1.4 to 2.6)	0.0 (-0.2 to 0.2)	<0.001	2.36

No significant changes observed in safety parameters during the initial RCT
(Ginsberg & Lindefors, Br J Psych, 2012, 200: 68-73)

Safety parameters	OROS-methylphenidate (n=15)	Placebo (n=15)	P-value
Systolic blood pressure, mmHg, mean (95% CI), baseline	122.5 (113.8 to 131.2)	128.9 (118.6 to 139.2)	
Change 0-5w (RCT)	13.1 (2.7 to 23.6)	7.0 (-4.4 to 18.4)	0.79
Diastolic blood pressure, mmHg, mean (95% CI), baseline	69.2 (64.2 to 74.2)	73.0 (69.0 to 77.0)	
Change 0-5w (RCT)	5.2 (1.0 to 9.4)	-0.2 (-7.4 to 7.0)	0.86
Heart rate, beats per minute, mean (95% CI), baseline	66.9 (60.9 to 73.0)	64.5 (61.5 to 67.6)	
Change 0-5w (RCT)	4.0 (-2.1 to 10.1)	0.93 (-6.1 to 8.0)	0.15

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ORIGINAL PAPER

Long-term functional outcome in adult prison inmates with ADHD receiving OROS-methylphenidate

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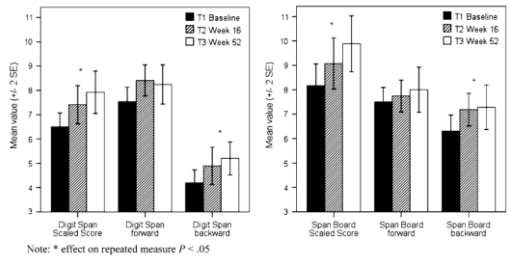
Effectiveness over 52 weeks of treatment

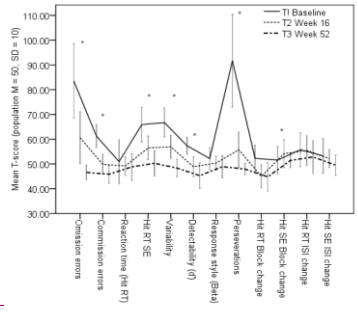
- Improvements in ADHD symptoms, global functioning, behaviour control and quality of life gained during the 5-week placebo-controlled phase, sustained and improved over the 47-week open-label extension
- Overall, symptomatic improvement translated into functional improvement
- A majority attended and completed CBT programs, educational activities and vocational training
- In a few participants, heart rate and blood pressure increased over time; no reason for discontinuation
- No misuse of medication or side abuse was detected

Both verbal- and visuospatial working memory improved over 52 weeks



Note: * effect on repeated measure $P < .05$

Inattention, impulsivity and reaction time variability were normalised (Conners CPT II)



*effect on repeated measure $p < .05$

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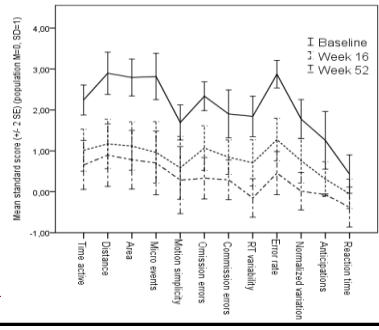
Impulsivity, inattention, reaction time variability and motor activity vastly improved (QbTest)



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Conclusions from the 52-week trial and 3 years of naturalistic follow-up (Unpublished)

- OROS-mph feasible, effective and overall safe
  - →In the short-term vs. placebo (Cohen's *d* = 2.17, NNT = 1.1)
  - →Over 52 weeks combined with preventive CBT programs
  - →Stimulants for ADHD under strictly controlled conditions useful component of multimodal treatment
- Improvements gained during 52-week trial maintained up to 3 years in a naturalistic follow-up of completers
  - →A majority employed without reoffending or drug misuse
  - →Poorer outcomes for non-medicated at follow-up
    - Motivational support, continued medication and multimodal treatment are important for improved outcome

Will ADHD treatment reduce criminal recidivism and save money for society?

- ADHD + crime extremely costly for individuals and society
- This first prison trial: Small study sample
- Swedish register-based study (Lichtenstein et al, 2012): Reduced criminality risk of 32-41% within individuals during periods with vs. without ADHD medication
- Swedish trial (Konstenius et al, 2013): 54 male prisoners with ADHD + amphetamine dependence in an 24-week RCT
  - Initiated on OROS-mph/placebo 2 weeks before prison release, continued medication + CBT in outpatient care
  - OROS-mph reduced drug relapse (primary outcome) and ADHD symptoms (secondary) vs. placebo

→ Trial results need to be replicated

Thank you for your attention!