High Anticholinergic Burden at Admission is associated with In-hospital Mortality in Older Patients: A comparison of 19 different Anticholinergic Burden Scales

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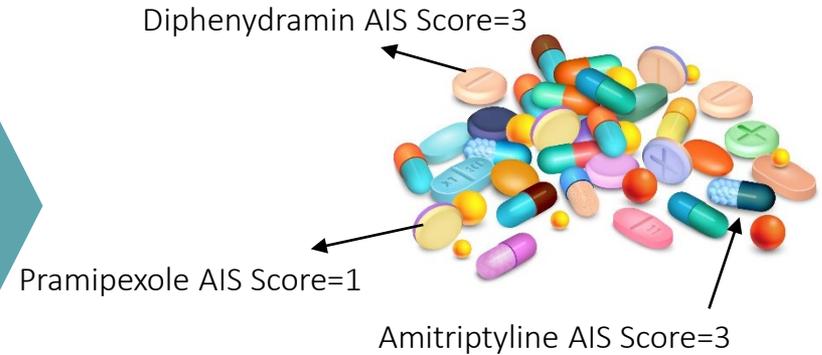[4] Federal Institute of Technology, Zurich, Switzerland

Drugs with Anticholinergics Properties
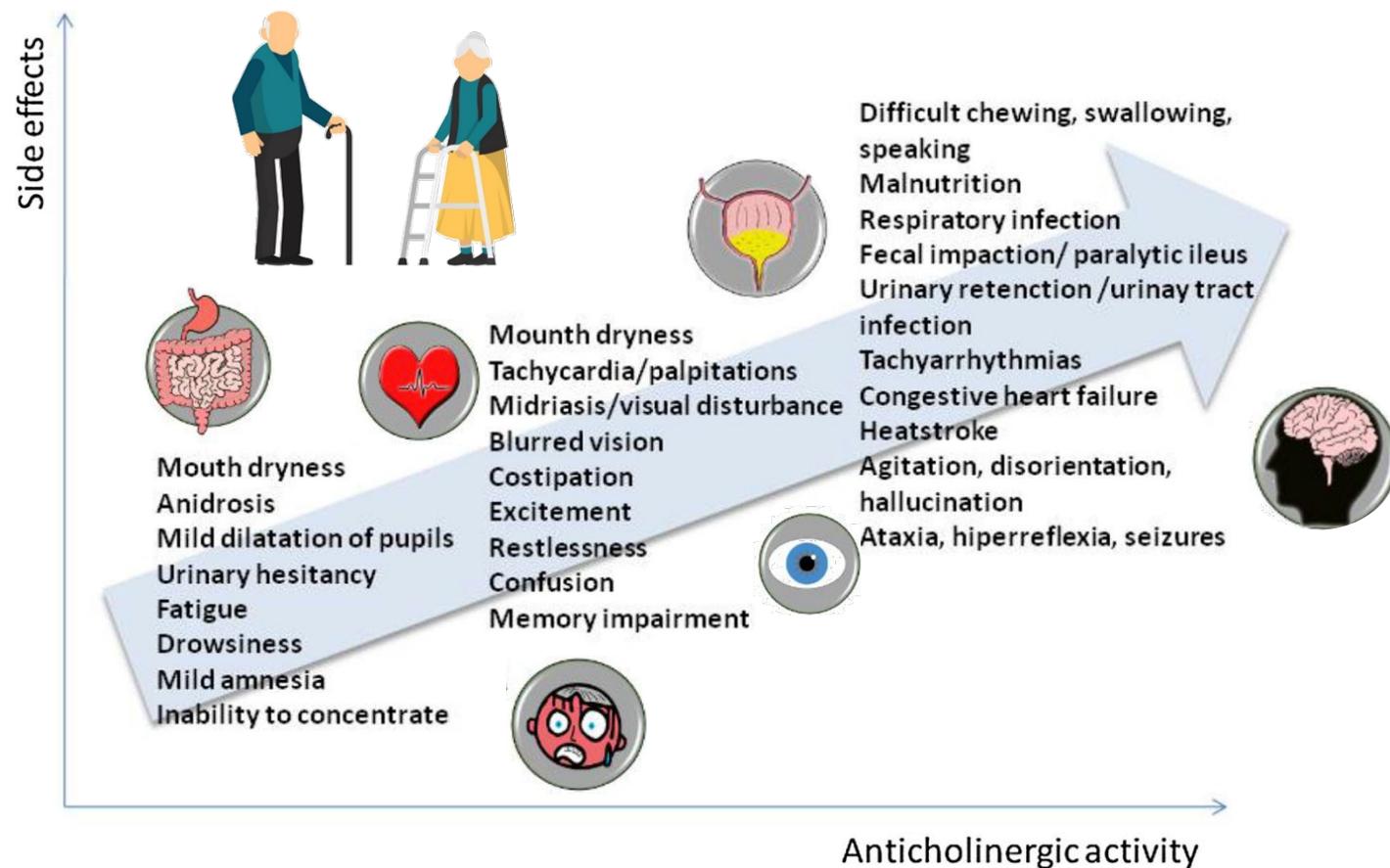
1. *Collamati et al., BMJ, 2016*
2. *From: www.medicinesafety.co.uk*
3. *Mangoni et al. BJCP, 2003*

19 Anticholinergic Burden Scales (ABS)

ACB
AAS
ACL
ADS
CrAS
BAADS
CABS
AEC
SCDL
PI, CI
ABC
ATS
ARS
DRS
KABS
DS
GABS
AEC
AIS

Diphenydramin AIS Score=3

Pramipexole AIS Score=1

Amitriptyline AIS Score=3

Summing up:
3+1+3=7

1. Lisibach et al., EJCP, 2020

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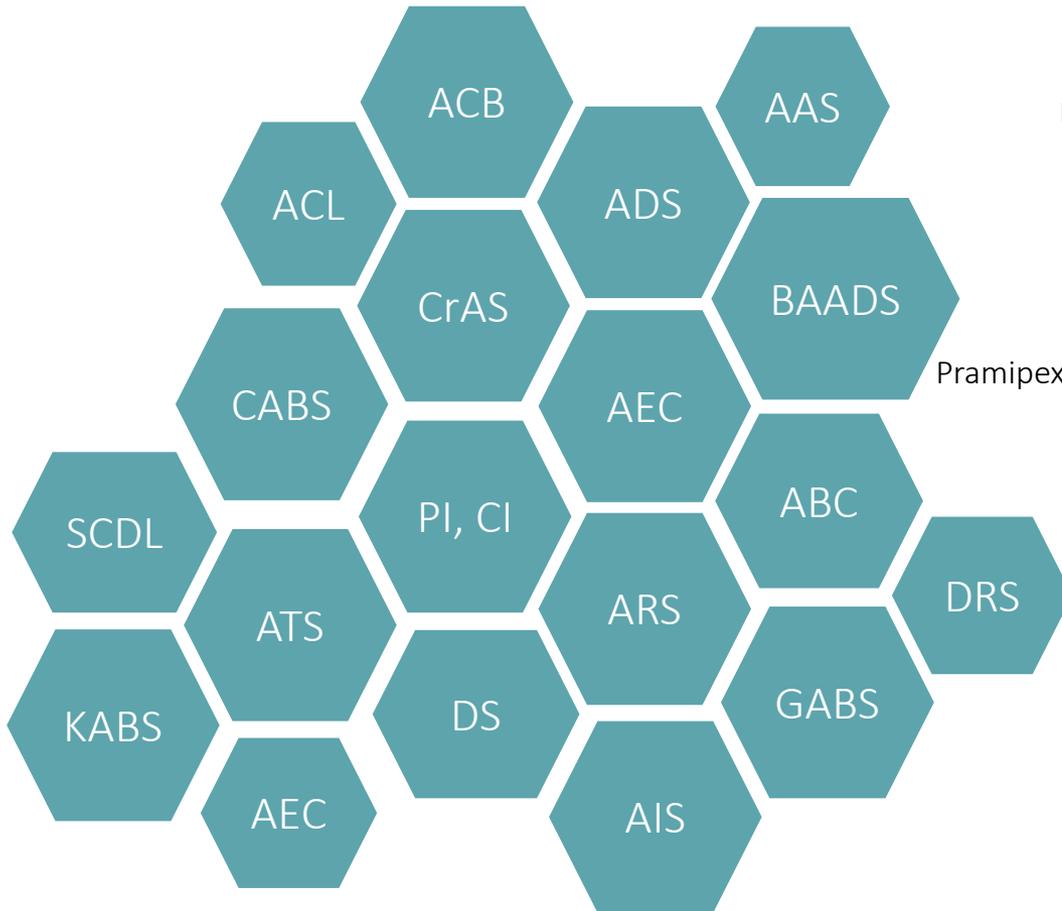
Aim:

Comparing all 19 ABS by evaluating their association with in-hospital mortality in patients ≥65 years
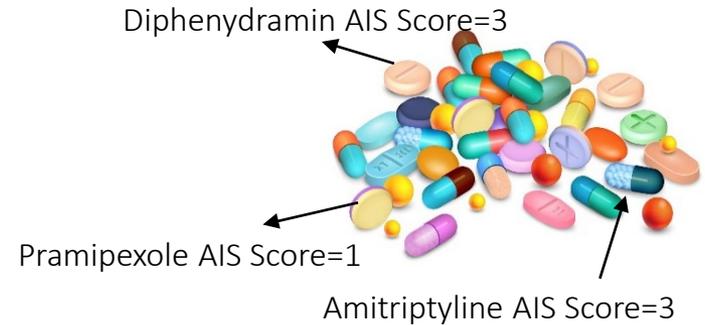
Methods

- Retrospective cohort study
- Data from the Kantonsspital Baden 2015-2018

Inclusion	Exclusion
+ Inpatients ≥65 years + Hospitalized longer than ≥48 h	- Outpatients - Being on the ICU >24 h

- Multivariable regression adjusted to other risk factors and potential confounders

Exposure

Diphenydramin AIS Score=3

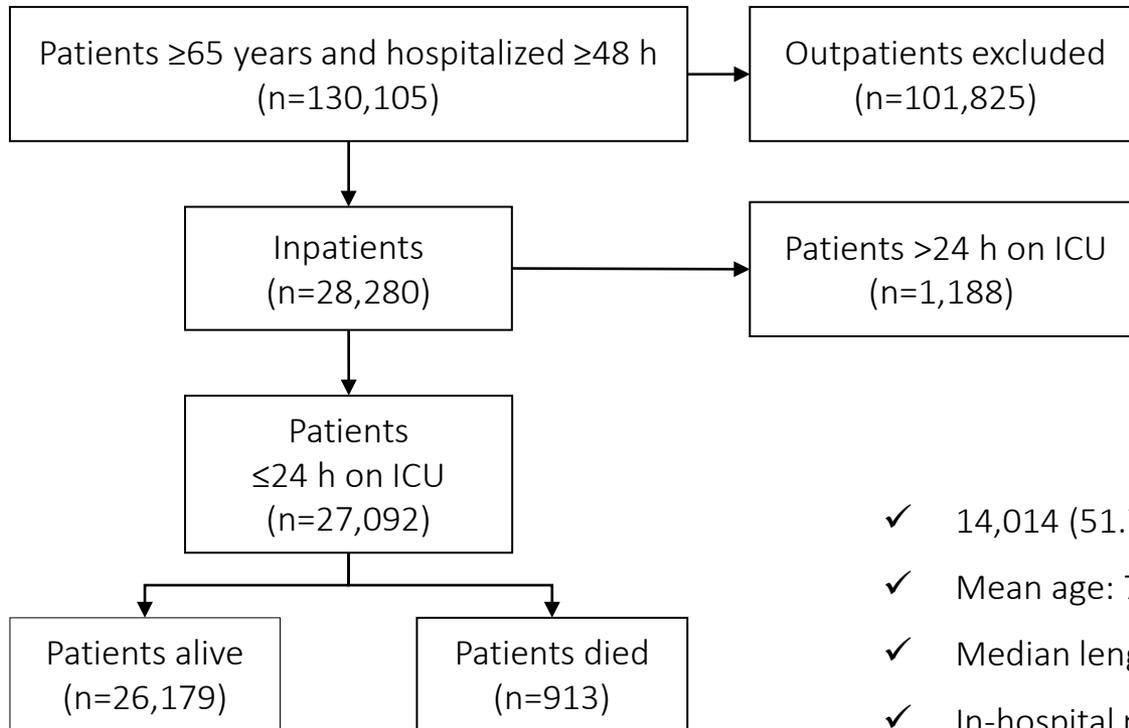Pramipexole AIS Score=1

Amitriptyline AIS Score=3

i.   Binary:

- score of <3 low burden
- score of ≥3 high burden

Summing up:
3+1+3=7

ii.   Categorical:

- score of 0 no burden
- score of 0.5-3 low burden
- score of ≥3 high burden

Results 1

Patients ≥65 years and hospitalized ≥48 h (n=130,105) → Outpatients excluded (n=101,825)

Inpatients (n=28,280) → Patients >24 h on ICU (n=1,188)

Patients ≤24 h on ICU (n=27,092)

Patients alive (n=26,179)

Patients died (n=913)

- ✓ 14,014 (51.7%) women
- ✓ Mean age: 78.08±7.69 years
- ✓ Median length of stay: 6 days [IQR 4-10]
- ✓ In-hospital mortality prevalence: 3.4%

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Results 2

(i) **Binary approach**: (reference low burden <3)

Scale		High burden, score of ≥3
ABC	(Ancelin, 2006)	OR 1.48, CI 95% 1.03-2.08
AIS	(Briet, 2017)	OR 1.34, CI 95% 1.08-1.64
CABS	(Cancelli, 2008)	OR 2.12, CI 95% 1.48-2.97
AAS	(Ehrt, 2010)	OR 1.41, CI 95% 1.04-1.89
CrAS	(Han, 2008)	OR 1.46, CI 95% 1.08-1.95
ADS	(Carnahan, 2006)	OR 2.36, CI 95% 1.69-3.22
SCDL	(Summers, 1978)	OR 2.47, CI 95% 2.05-3.63
DS	(Duran, 2013)	OR 1.58, CI 95% 1.30-1.91
BAADS	(Nery, 2019)	OR 1.37, CI 95% 1.11-1.67
KABS	(Jun, 2019)	OR 1.37, CI 95% 1.08-1.73
ATS	(Xu, 2016)	OR 1.94, CI 95% 1.30-2.80
DRS	(Hefner, 2015)	OR 1.57, CI 95% 1.22-2.00

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Results 3

(ii) **Categorical approach**: (reference no burden =0)

Scale		Low burden, score of 0.5-3	High burden, score of ≥3
ABC	(Ancelin, 2006)	OR 0.94, CI 95% 0.36-2.04	OR 1.48, CI 95% 1.03-2.08
AIS	(Briet, 2017)	OR 1.15, CI 95% 0.94-1.41	OR 1.37, CI 95% 1.11-1.69
CABS	(Cancelli, 2008)	OR 1.23, CI 95% 0.87-1.71	OR 2.15, CI 95% 1.50-3.01
AAS	(Ehrt, 2010)	OR 0.99, CI 95% 0.72-1.34	OR 1.41, CI 95% 1.04-1.89
CrAS	(Han, 2008)	OR 1.15, CI 95% 0.92-1.42	OR 1.49, CI 95% 1.09-1.98
ADS	(Carnahan, 2006)	OR 1.16, CI 95% 0.95-1.41	OR 2.41, CI 95% 1.72-3.30
SCDL	(Summers, 1978)	OR 0.85, CI 95% 0.52-1.31	OR 2.74, CI 95% 2.04-3.61
DS	(Duran, 2013)	OR 1.02, CI 95% 0.83-1.25	OR 1.58, CI 95% 1.30-1.92
BAADS	(Nery, 2019)	OR 1.10, CI 95% 0.90-1.34	OR 1.39, CI 95% 1.13-1.70
KABS	(Jun, 2019)	OR 1.12, CI 95% 0.91-1.37	OR 1.40, CI 95% 1.10-1.76
ATS	(Xu, 2016)	OR 0.84, CI 95% 0.32-1.82	OR 1.93, CI 95% 1.30-2.80
DRS	(Hefner, 2015)	OR 1.01, CI 95% 0.83-1.22	OR 1.58, CI 95% 1.22-2.01

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Discussion

- Differences in ABS:
  - Different amount of drugs scored
  - From different countries (USA, France, Italy, Norway...)
  - Different scoring systems

- Strength:
  - Big cohort
  - Statistical adjustment to most common diseases

- Limitation:
  - Single-centre retrospective study (No follow-up)

Conclusion

- A cut-off at a anticholinergic burden score of ≥3 is needed for a significant increase of in-hospital mortality.

- Targeted intervention at admission to reduce the anticholinergic burden in older patient might reduce in-hospital mortality.

- Customized ABS for Switzerland is needed.

Thank you for your attention !