MUNI
MED

Léčebné metody - farmakoterapie

Libor Ustohal

Výstupy z učení

- Student bude znát nejdůležitější skupiny psychofarmak, jejich mechanismus účinku, indikace a nežádoucí účinky

- Student bude znát základní údaje o antidepresivech, antipsychoticích, anxiolyticích, hypnoticích, thymostabilizérech, kognitivech a psychostimulanciích

Antidepresiva

- Antidepresiva (AD) zlepšují monoaminovou (serotoninovou, noradrenalinovou, dopaminovou) neurotransmisi v mozku, která je u depresivní poruchy narušená
- Indikace: kromě depresivní poruchy jsou to úzkostné poruchy (pro dlouhodobou léčbu), poruchy příjmu potravy, insomnie, chronická bolest a některé další (Masopust In Hosák et al., 2016)

Rozdělení AD dle jejich mechanismu účinku

Table 21.1. Division of antidepressants according to their mechanism of action

Inhibition of monoamine reuptake	1st generation – tricyclics, tetracyclics 2nd generation – heterocyclics 3rd generation – SSRI, SARI, NARI, DARI 4th generation – SNRI 5th generation – SNDRI
Direct action at receptors	α2-blockers – mianserin, mirtazapine 5-HT1A agonists – buspirone, gepirone MASSA – agomelatine
Inhibition of biodegradation	MAO inhibitors 1st generation – non-selective – irreversible – tranylcypromine 2nd generation – selective IMAO-A – reversible (moclobemide) IMAO-B – irreversible (selegiline) COMT inhibitors

COMT – catechol-O-methyltransferase; DARI – dopamine reuptake inhibitor; IMAO-A – monoamine oxidase A inhibitor; IMAO-B – monoamine oxidase B inhibitor; MASSA – melatonin agonist and selective serotonin antagonist; NARI – norepinephrine reuptake inhibitor; SARI – serotonin antagonist and serotonin reuptake inhibitor; SNDRI – serotonin, norepinephrine and dopamine reuptake inhibitor; SNRI – serotonin and norepinephrine reuptake inhibitor; SSRI – selective serotonin reuptake inhibitor; 5HT1A – serotonin 1A receptor

Masopust, In Hosák et al., 2016

Přehled AD I

Table 21.2. Overview of antidepressants and their common dosage

Antidepressant		Starting dose (mg/day)	Common dose (mg/day)
Thymoleptics (tricyclic, tetracyclic)	amitriptyline	25–50	75–250
	dibenzepin	240	240–600
	dosulepin	25–50	100–400
	imipramine	25–50	100–300
	clomipramine	25–50	75–200
	maprotiline	25–50	75–150
	mianserin	30	60–120
	nortriptyline	25–50	75–200
SSRI	citalopram	20	20–40
	escitalopram	10	10–20
	fluoxetine	20	20–40
	fluvoxamine	50	100–200
	paroxetine	20	20–40
	sertraline	50	50–200
SARI	trazodone	75	150–500
	nefazodone	200	200–600

Masopust, In Hosák et al., 2016

Přehled AD II

SNRI	venlafaxine	37.5–75	75–375
	milnacipran	75	75–200
	duloxetine	60	60–120
NaSSA	mirtazapine	15	15–45
NARI	reboxetine	4	4–12
NDRI	bupropion	150	150–300
IMAO-A	tranylcypromine	10	10–40
RIMA	moclobemide	150	300–600
MASSA	agomelatine	25	25–50
Others	St John's wort extract	900	1200–1800
	tianeptine	12.5	37.5
	vortioxetine	10.0	10–20

IMAO-A – monoamine oxidase A inhibitor; MASSA – melatonin agonist and selective serotonin antagonist; NARI – norepinephrine reuptake inhibitor; NaSSA – norepinephrinergic and selective serotonergic antidepressant; NDRI – norepinephrine and dopamine reuptake inhibitor; RIMA – monoamine oxidase A reversible inhibitor; SARI – serotonin antagonist and serotonin reuptake inhibitor; SNRI – serotonin and norepinephrine reuptake inhibitor; SSRI – selective serotonin reuptake inhibitor

Masopust, In Hosák et al., 2016

Srovnání účinnosti a tolerability AD

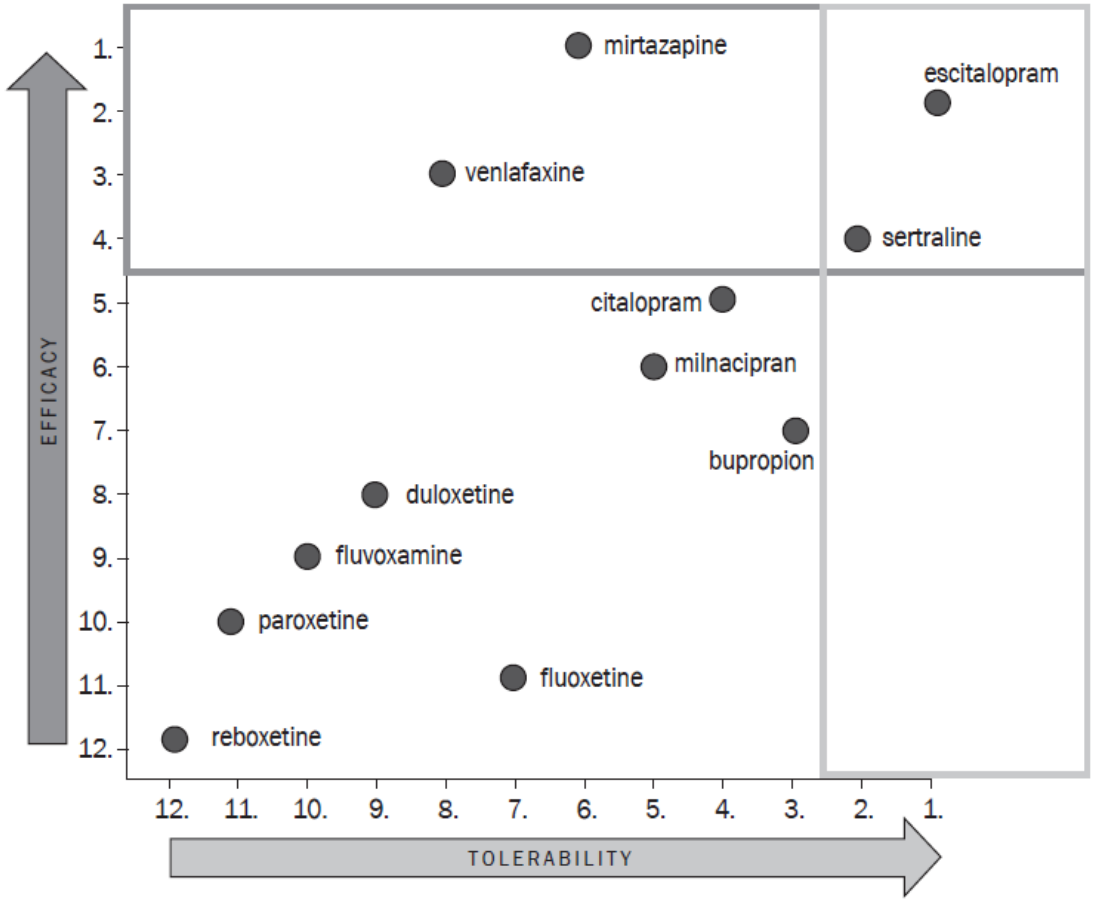

Figure 21.1. A comparison of efficacy and tolerability of individual antidepressants

Masopust, In Hosák et al., 2016

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Hlavní NÚ jednotlivých skupin AD

Table 21.3. Main adverse side effects of individual groups of antidepressants

SSRI	nausea, diarrhoea, sexual dysfunctions, insomnia, agitation, headache, mental tension, anxiety
NDRI	headache, agitation, weight loss, nausea, insomnia
SARI	vertigo, headache, nausea, somnolence, insomnia
SNRI	nausea, diarrhoea, vertigo, somnolence, insomnia, loss of appetite, anxiety, headache, sexual dysfuntions
TCA	sedation, vertigo, dry mouth, nausea, insomnia, anxiety, tremor, constipation, blurred vision, arrhythmia, ECG QTc prolongation, urine retention, priapism
NaSSA	vertigo, diarrhoea, increased appetite, weight gain, dry mouth, somnolence
MASSA	increase in activity of serum aminotransferases (ALT, AST)
IMAO	restlessness, vertigo, blurred vision, diarrhoea, insomnia, weakness, arrhythmia, headache, sexual dysfunction
RIMA	vertigo, nausea, insomnia, headache, agitation
NARI	insomnia, anxiety, tachycardia, blood pressure instability, constipation, dry mouth

Masopust, In Hosák et al., 2016

Antipsychotika

- Antipsychotika (AP) jsou základem léčby psychóz
- Mezi další indikace AP patří bipolární afektivní porucha, depresivní porucha a také úzkostné poruchy (AP bývají přídatnou medikací) a rovněž agitovanost, popř. některé další
- Základem účinku AP je blokáda postsynaptických dopaminových D2/D3 receptorů v mezolimbické (dochází k redukci psychotických příznaků), mezokortikální (může zhoršovat negativní a kognitivní příznaky), nigrostriatální (extrapyramidové symptomy) a tuberoinfundibulární

Antipsychotika

(hyperprolaktinémie) oblasti mozku, společně s blokádou presynaptických D2/D3 zakončení

- AP jsou obvykle dělena na AP I. generace (AP1G; typická AP) a AP II. generace (AP2G; atypická AP) (Masopust in Hosák et al., 2016)

AP – blokáda jednotlivých receptorů a jejich klinická manifestace I

Table 21.5. The blockade of receptors by antipsychotics and supposed clinical consequences

Blockade of receptors		Clinical manifestation
D2	mesolimbic and mesocortical nigrostriatal tuberoinfundibular	antipsychotic effect extrapyramidal syndrome increase in prolactinemia, blockade of the FSH and LH hormones secretion
D2 – presynaptic autoreceptors	increase in the prefrontal dopamine level increase in the striatal dopamine level	improvement of negative, cognitive and depressive schizophrenia symptoms reduction of extrapyramidal symptoms
5-HT2	increase in the prefrontal dopamine level increase in the striatal dopamine level	improvement of negative, cognitive and depressive schizophrenia symptoms reduction of extrapyramidal symptoms
5-HT1A	increase in the prefrontal dopamine level	anxiolytic effect improvement of negative, cognitive and depressive schizophrenia symptoms

Masopust, In Hosák et al., 2016

AP – blokáda jednotlivých receptorů a jejich klinická manifestace II

α_1	cardiovascular effects (orthostatic hypotension, syncopes, reflex tachycardia, atrioventricular conduction disturbances) sexual effects (decreased libido, impotence) apathy, hypobulia
α_2	modulation of the antihypertensive effect of clonidine and alpha-methyldopa
H1	sedation weight increase hypotension
H2	decrease in gastric secretion
M1	lower incidence of extrapyramidal symptoms xerostomia impaired accommodation

Masopust, In Hosák et al., 2016

AP – blokáda jednotlivých receptorů a jejich klinická manifestace III

M1	constipation, urine retention, paralytic ileus sinus tachycardia impairment of cognition
SRI	potential antidepressive and anxiolytic effect gastrointestinal symptoms sexual dysfunctions extrapyramidal symptoms potential increase of anxiety
NRI	potential antidepressive and anxiolytic effect tremor tachycardia

D2 – dopamine D2 receptor; 5-HT2 – serotonin 5-HT2 receptor; 5-HT1A – serotonin 5-HT1A receptor; α_1 – alpha-1 adrenergic receptor; α_2 – alpha-2 adrenergic receptor; H1 – histamine H1-receptor; H2 – histamine H2-receptor; M1 – muscarinic M1-receptor; SRI – inhibition of serotonin transporter; NRI – inhibition of noradrenergic transporter

Masopust, In Hosák et al., 2016

První generace (typická) AP – přehled

Table 21.6. Overview of first generation antipsychotics

Chemical group	Generic name
Sedative (basal, low potency) antipsychotics	
phenothiazines	chlorpromazine, levomepromazine*, thioridazine, periciazine
thioxanthenes	chlorprothixene*, zuclopenthixol*
Incisive (high potency) antipsychotics	
phenothiazines	perphenazine, prochlorperazine, fluphenazine*, trifluoperazine
thioxanthenes	flupenthixol*
butyrophenones	haloperidol*, melperone*
diphenylbutylpiperidines	pimozide, fluspirilene, penfluridol
perathiepines	oxyprothepin

* The marked preparations are still available in the Czech Republic. Nevertheless, the safety of antipsychotic treatment is being considered more and more seriously.

Masopust,
In Hosák et al., 2016

První generace AP užívaná v ČR

Table 21.7. First generation antipsychotics recently used in the Czech Republic

Preparation	Medicament form	Dosage range	Characteristic
		Sedative	
levomepromazine	tbl., inj.	12.5–600 mg/day	strong sedative effect, treatment of acute agitation
chlorprothixene	tbl.	15–600 mg/day	sedative effect, anxiolytic effect in low doses
zuclopenthixol	tbl., inj., long-acting inj.	25–100 mg/day	treatment of acute psychotic agitation and aggressiveness, semi-depot injections (2–3 days) and depot injections are available
		Incisive	
fluphenazine	long-acting inj.	1–12.5 mg/week*	applied in a depot form in the maintenance treatment
flupenthixol	tbl., long-acting inj.	1–3 mg/day 10–20 mg/week*	low sedative effect, depot form available
haloperidol	tbl., gtt., inj., long-acting inj.	1.5–10 mg/day 5–25 mg/week*	high effect in positive symptoms, agitation and aggressiveness, no marked sedative effect
melperone	tbl.	25–200 mg/day	suitable in behavior disorders associated with dementia

* The dose for a depot form

Masopust, In Hosák et al., 2016

Dělení AP II. generace dle jejich mechanismu působení

Table 21.8. The division of second generation antipsychotics according to their mechanism of action and receptor profile

Pharmacodynamic effect	Chemical group	Blockade of receptors				
		D2	5-HT2	α_1	H1	M
selective antagonists of dopamine D2/D3 receptors	*benzamides:*					
	amisulpride	++				
	sulpiride	++				
antagonists of serotonin and dopamine receptors (SDA)	*benzisoxazoles:*					
	ziprasidone	++	+	+		
	iloperidone	++	+	+		
	sertindole	++	+	+		
	risperidone*	++	+	+	±	
multireceptor antagonists (MARTA)	*dibenzodiazepines:*					
	quetiapine	+	+	+	+	
	zotepine	++	+	+	+	±
	olanzapine	++	+	+	+	+
	clozapine	+	+	+	+	++
dualists of dopamine D2/D3 receptors and antagonists of serotonin 5-HT2 receptors	aripiprazole	+	+		+	

D2 – dopamine, 5-HT2 – serotonine 5-HT2, α_1 – alpha-adrenergic, H1 – histamine, M – muscarine receptors

*the risperidone metabolite paliperidone also belongs to this group

Masopust, In Hosák et al., 2016

Charakteristika AP II. generace I

Table 21.9. Characteristics and dosage of second generation antipsychotics

Preparation	Drug form	Dosage range	Characteristic
amisulpride	tbl.	200–800 mg/day	high treatment efficiency in positive, negative, depressive and cognitive schizophrenia symptoms
aripiprazole	tbl., inj., long-acting inj.	15–30 mg/day	low level of adverse side effects (weight gain, metabolic symptoms, prolactinemia, sedation), suitable as add-on medication
clozapine	tbl.	100–900 mg/day	the most efficient antipsychotic, suitable in treatment resistance, aggressiveness, decreases the risk of suicide, induces serious adverse side effects (hematotoxicity)
olanzapine	tbl., inj., long-acting inj.	5–20 mg/day 75–150 mg/week*	belongs to the most efficient antipsychotics, but causes serious weight gain and metabolic symptoms
paliperidone	tbl., long-acting inj.	3–9 mg/day 6.25–37.5 mg/week*	active metabolite of risperidone, stable plasmatic level, once a day dosage due to sequential release tablets, excreted by kidneys, low risk of interactions

Masopust, In Hosák et al., 2016

Charakteristika AP II. generace II

quetiapine	tbl.	300–800 mg/day	sequential release tablets also available, used in bipolar disorder more than in schizophrenia, almost no extrapyramidal symptoms, its active metabolite has antidepressive properties
risperidone	tbl., sol., long-acting inj.	2–6 mg/day 12.5–25 mg/week*	indicated in schizophrenia, mania, conduct disorders in dementia and children (> 5 years)
sertindole	tbl.	4–24 mg/day	limited by its prolongation of QTc interval, ECG must be monitored
sulpiride	tbl.	50–800 mg/day	also applied in the treatment of non-organic dyspeptic syndrome
ziprasidone	tbl., inj.	40–160 mg/day	insignificant metabolic adverse side effects, second-choice medicament due to its mild QTc interval prolongation
zotepine	tbl.	75–300 mg/day	medicament on the AP1G/AP2G border, rarely applied

* The dose for a depot form

Masopust, In Hosák et al., 2016

NÚ AP II. generace a haloperidolu

Table 21.10. Overview of adverse side effects of AP2G and haloperidol

	Weight gain	Dyslipi-demia	Hyper-glycemia	PRL	↑QTc	EPS/TD	Hypo-tension	Sedation
Clozapine[1]	+++	+++	+++	0	0	0	+++	+++
Olanzapine	+++	+++	+++	0/+	(+)	0/+	+	+
Quetiapine	++	+ +	++	0	(+)	0	++	++
Zotepine	++	+?	+?	++	+	++	+	+
Risperidone	++	++	++	+++	(+)	+ / ++	+	+
Ziprasidone	0/+	0	0	+	+	0/+	0	0/+
Sertindole[2]	+	0 ?	0 ?	0/+	+	0	++	0/+
Aripiprazole	0	0	0	0	0	0	0/+	0/+
Amisulpride	+	0	0	+++	(+)	++	0	++
Haloperidol	+	(+)	(+)	+++	+	+++	+	+

0 = no, (+) = sporadic, similar to placebo, + = mild, ++ = medium, +++ = frequent, ? = lacking or inconclusive data

EPS – extrapyramidal adverse effects, TD – tardive dyskinesia, QTc – corrected QT interval on ECG; PRL – prolactinemia

[1] increased risk of agranulocytosis, epileptic seizures, myocarditis and cardiomyopathy

[2] may induce a decrease in ejaculate volume

Masopust, In Hosák et al., 2016

Anxiolytika

- Potlačují anxietu a působí sedaci, útlum CNS
- Kromě anxiolytického účinku mohou mít účinky hypnotické, antikonvulzivní a myorelaxační
- Platí, že několik neurotransmiterových systemů participuje na rozvoji úzkosti
- GABAergní deficit (zvláště v limbické oblasti mozku) může být zmírněn benzodiazepiny
- Deficit v serotonergním působení je redukován některými serotonergními agonisty (buspiron, SSRI a SNRI AD) (Masopust In Hosák et al., 2016)

Anxiolytika – rozdělení

Table 21.14. Division of anxiolytics

1. Non-benzodiazepine anxiolytics ▪ propanediols: guaifenezin ▪ hydroxyzine ▪ buspirone
2. Benzodiazepine anxiolytics
3. Medicaments with other main therapeutic effect, but also having anxiolytic action ▪ antidepressants ▪ antipsychotics ▪ anticonvulsants: pregabalin ▪ beta-blockers

Masopust, In Hosák et al., 2016

Benzodiazepinová anxiolytika

Table 21.15. Benzodiazepine anxiolytics used the most frequently

Benzodiazepine	Usual daily dose (mg)	Elimination half-life (hours)
alprazolam	0.5–4	12–15
bromazepam	1.5–9	12–24
diazepam	5–30	24–72
chlordiazepoxide	10–50	20–80
clonazepam	1–6	34
medazepam	10–30	29
oxazepam	30–90	4–20
tofisopam	50–300	6

Masopust, In Hosák et al., 2016

Hypnotika

- Hypnotika jsou psychofarmaka navozující spánek, v nižších dávkách sedaci
- Hypnotika se obvykle dělí do “generací”
- Hypnotika I. generace jsou s výjimkou klomethiazolu obsolentní a neužívají se
- Na základě mechanismu účinku dělíme hypnotika na GABAergní, melatoninová, histaminová a serotoninová (Masopust in Hosák et al., 2016)

Hypnotika – rozdělení na generace

Table 21.16. Division of hypnotics into generations

I. generation	barbiturates non-barbiturate hypnotics chloral hydrate clomethiazole
II. generation	benzodiazepines
III. generation	Z-hypnotics
IV. generation	melatonin ramelteon
Other psychotropics with hypnotic action	antidepressants antipsychotics antihistamines anticonvulsants

Masopust, In Hosák et al., 2016

Hypnotika – mechanismus účinku

Table 21.17. Division of hypnotics according to the mechanism of action

Hypnotics	Mechanism of action	Medicaments
GABAergic	agonists of GABA-A receptors	benzodiazepines clomethiazole Z-hypnotics
melatonin	agonists of MT1/2 receptors	melatonin agomelatine ramelteon
histamine	antagonists of H1 receptors agonists of H3 receptors	promethazine
serotonin	antagonists of 5-HT2A receptors	antidepressants antipsychotics

Masopust, In Hosák et al., 2016

Benzodiazepinová hypnotika

Table 21.18. Benzodiazepines registered as hypnotics

Hypnotic	Common daily dose (mg)	Elimination half-life (hours)
cinolazepam	20–40	3.8–6
flunitrazepam*	0.5–1	9–31
flurazepam	15–30	28
midazolam	7.5–15	1.2–2.5
nitrazepam*	5–10	24
triazolam	0.125–0.25	2.1–6

* not available in the Czech Republic

Masopust, In Hosák et al., 2016

Hypnotika III. generace

Table 21.19. The third generation hypnotics

Hypnotic	Elimination half-time (hours)	Common dose (mg)	Indication/action
zaleplon*	1	5–10	impaired falling asleep
zolpidem	2.4	5–10	impaired falling asleep and the first half of the night
zopiclone	5	3.75–7.5	impaired falling asleep, waking up during the night, early morning insomnia
zolpidem CR**	6	12.5	falling asleep, continuation of sleep
eszopiclone***	6	2–3	falling asleep, continuation of sleep

* not available in the Czech Republic; ** galenic formulation with a slow release, not yet registered in the European Union; *** not registered in the European Union

Masopust,
In Hosák et al., 2016

Ostatní psychofarmaka užívaná jako hypnotika

Table 21.20. Other psychotropics with hypnotic action

Medication group	Preparations	Remarks
antidepressants	mirtazapine, trazodone, mianserine, amitriptyline, dosulepine	amitriptyline, trazodone – caution in old and somatically ill subjects owing to adverse side effects
antipsychotics	quetiapine, olanzapine, levomepromazine, chlorprothixene, tiapride	in low doses, due to risk of adverse side effects applied in resistant insomnia only
antihistamines	promethazine, hydroxyzine	decrease ability to drive
anticonvulsants	gabapentine	
herbal preparations	medicaments with extracts of *Valeriana officinalis*, hops, kava-kava, *Melissa officinalis* or *Passiflora incarnata*	mild hypnotic effect

Masopust,
In Hosák et al., 2016

Thymostabilizéry

- Thymostabilizéry (stabilizátory nálady) jsou psychofarmaka, která snižují nebo eliminují frekvenci a intenzitu manických, depresivních a smíšených epizod během dlouhodobé profylaktické léčby a účinkují antimanicky a antidepresivně během akutních epizod, avšak nepůsobí přesmyk do opačné polarity
- Zejména lithium se blíží tomuto ideálu. Avšak jeho účinnost v akutní léčbě bipolární deprese je nižší a jeho nástup účinku bývá pomalý (Masopust In Hosák et al., 2016)

Thymostabilizéry

- Dobrý thymostabilizér by měl být dobře tolerovaný pacienty v akutní i dlouhodobé léčbě, účinný v monoterapii, mít široké spektrum účinnosti (na afektivní, kognitivní, behaviorální příznaky) a být ověřený
- K tzv. “klasickým” thymostabilizérům (jako je lithium, valproát, karbamazepin, popř. lamotrigin) jsou čím dál častěji přiřazována AP II. generace a to na základě důkazů o jejich účinnosti v různých fázích BAP (Masopust In Hosák et al., 2016)

Thymostabilizéry a jejich indikace v rámci BAP

Table 21.22. Scientific evidence related to individual mood stabilizers and their indications within bipolar affective disorder

Medicament	Acute treatment		Prophylaxis	
	mania	depression	mania	depression
valproate	+	–	+	–
lithium	+	– (+)	+	+
carbamazepine	+	–	– (+)	– (+)
lamotrigine	–	–	–	+
aripiprazole	+	–	+	–
olanzapine	+	– (+ OFC)	+	+
quetiapine	+	+	+	+
risperidone	+	–	– (+ RLAI)	–
ziprasidone	+	–	–	–

+ the given medication is indicated; – the indication of the given medication is not supported by recent scientific evidence; – (+) scientific evidence is not sufficient, but this indication is recommended in the summary of product characteristics in the Czech Republic; + OFC = the FDA approved combination of olanzapine with fluoxetine for depression within BD; + RLAI = the FDA approved risperidone microspheres for prophylaxis of mania

Masopust, In Hosák et al., 2016

Kognitiva

- Kognitiva ze skupiny inhibitorů acetylcholinesterázy (AChE) zvyšují hladiny acetylcholinu na cholinergních synapsích
- V léčbě kognitivních poruch se užívají i preparáty inhibující NMDA receptory, čímž redukují glutamátovou neurotoxicitu, zvláště memantin, který je nekompetitivní antagonista NMDA receptorů

(Masopust et Vališ In Hosák et al., 2016)

Kognitiva

Table 21.24. Recommended daily dosages of individual cognitive enhancers

Week	Donepezil	Rivastigmine	Galantamine	Memantine
1.	1 × 5 mg	2 × 1,5 mg	1 × 8 mg	1 × 5 mg
2.				1 × 10 mg
3.		2 × 3,0 mg		1 × 15 mg
4.				1 × 20 mg
5.	1 × 10 mg	2 × 4,5 mg	1 × 16 mg	
6.				
7.		2 × 6,0 mg		
8.				
9.			1 × 24 mg	
10.				

Masopust et Vališ,
In Hosák et al., 2016

Kognitiva – jejich indikace

Table 21.26. Guidelines in the treatment with cognitive enhancers in the Czech Republic based on the MMSE score and the type of dementia

AD		AChE inhibitors		memantine	
AD – second choice			AChE inhibitors + memantine		
AD – in selected comorbidities		memantine			
Dementia in PD		rivastigmine			
Vascular dementia		AChE inhibitors (?)			
MMSE	> 25	25–50	19–13	12–6	< 6

AD – Alzheimer's disease, PD – Parkinson's disease

Masopust et Vališ,
In Hosák et al., 2016

Psychostimulancia

- Psychostimulancia zvyšují či modifikují vigilitu vědomí
- Koncentrace dopaminu a noradrenalinu v synaptické štěrbině může být zvýšena různými mechanismy
- Rezultuje ve zvýšení motorické aktivity, zrychluje myšlení, zvyšuje recall nápadů, ale i úzkost, tenzi, nespavost, odstraňuje únavu
- Zvýšení koncentrace noradrenalinu indukuje tachykardii, TK a může způsobit srdeční arytmie (Masopust In Hosák et al., 2016)

Psychostimulancia a jejich indikace

Table 21.27. Psychostimulants

Agent	Usual daily dose (mg)	Elimination half-time (hours)	Category of psychotropic agent (United Nations)	Indication
ephedrine	12.5–50	4	IV.	narcolepsy
methylphenidate*	10–60	2–2.5	II.	ADHD
modafinil	5–140	15	IV.	narcolepsy hypersomnia

* The form with an extended methylphenidate release OROS (osmotic release oral system) is also available

Masopust, In Hosák et al., 2016

Take home message I

- Mechanismus účinku AD je v inhibici zpětného vychytávání monoaminů, přímém ovlivnění receptorů a inhibici biodegradace
- Rozlišujeme několik podskupin AD, která se liší účinností a tolerabilitou
- Mechanismem účinku AP je blokáda některých receptorů, zvláště D2 receptoru
- Rozlišujeme dvě generace AP a několik podskupin mezi nimi; liší se v účinnosti a zejména v nežádoucích účincích

Take home message II

- Rozlišujeme tři skupiny anxiolytik, nebenzodiazepinová, benzodiazepinová a další psychofarmaka s anxiolytickým potenciálem
- Thymostabilizéry (zvláště lithium, valproát a některá AP) se užívají k léčbě bipolární afektivní poruchy
- Další skupiny psychofarmak zahrnují hypnotika, kognitiva a psychostimulancia

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