Dubbel utmaning: Neuropsykiatriska svårigheter och diabetes typ 1

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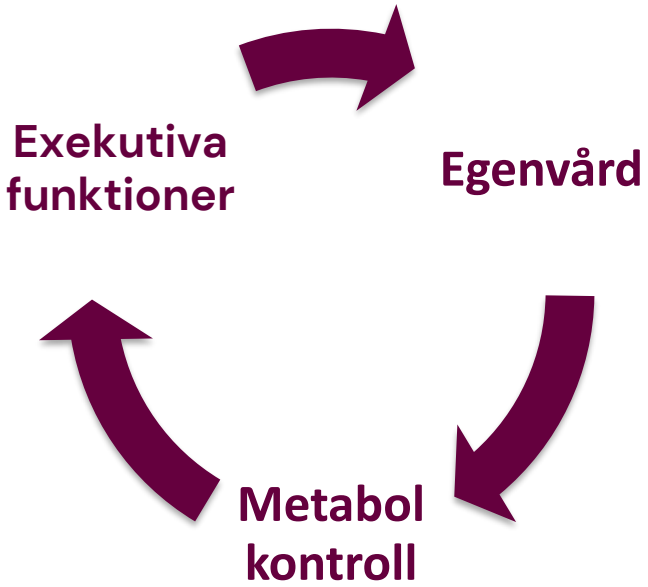
Vilken är den viktigaste vertyg i diabetes egenvård?


Arbetsminne
Planera/
Organisera
Flexibilitet
Uthållighet
Självreglering
Impulskontroll
Problemblösning
Tidsuppfattning
Metakognition
Exekutiva
funktioner

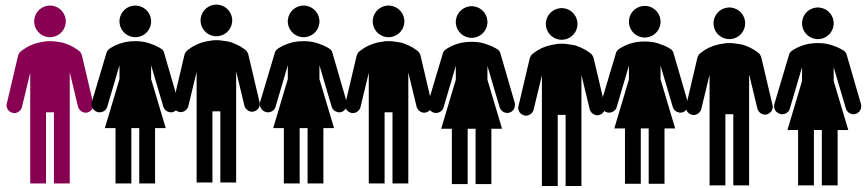
Vad är hönan och ägget?



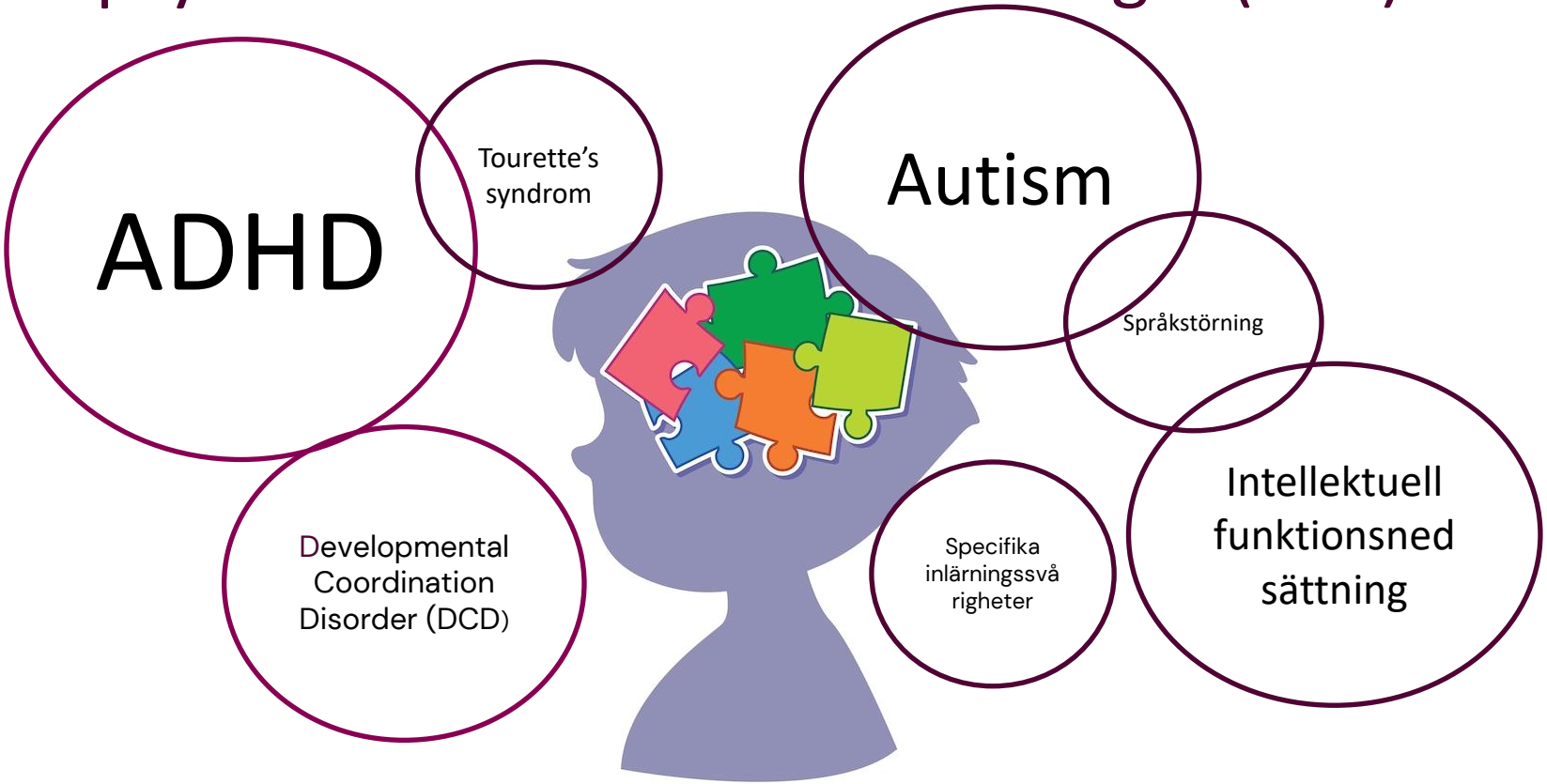
Wasserman RM et al, *Current diabetes reports.* 2015

Neuropsykiatriska funktionsnedsättningar (NPF)

- 10 % av Sveriges barn och ungdomar har Neuropsykiatriska funktionsnedsättningar (en eller flera diagnoser)

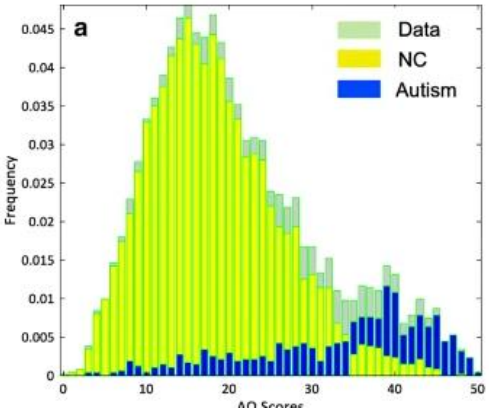


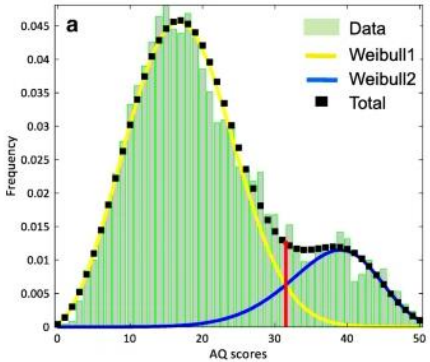
Neuropsykiatriska funktionsnedsättningar (NPF)



Neuropsykiatriska funktionsnedsättningar (NPF)

- **Neuropsykiatriska drag finns på en glidande skala**
- Många människor har drag, men endast en del upplever tillräckligt stora svårigheter för att det ska leda till en funktionsnedsättning.
- Graden av funktionsnedsättning påverkas av tillgången på resurser och de krav som ställs i personens omgivning





Abu-Akel et al, Mol autism 2019

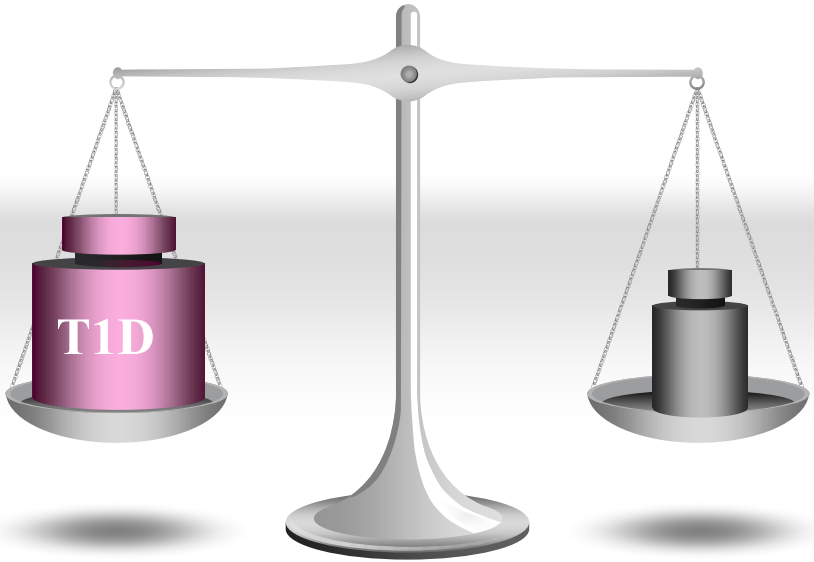
Neuropsykiatriska drag

Tillgängliga resurser hos individen och i hens omgivning

Neuropsykiatriska drag kan förekomma utan att innebära en funktionsnedsättning

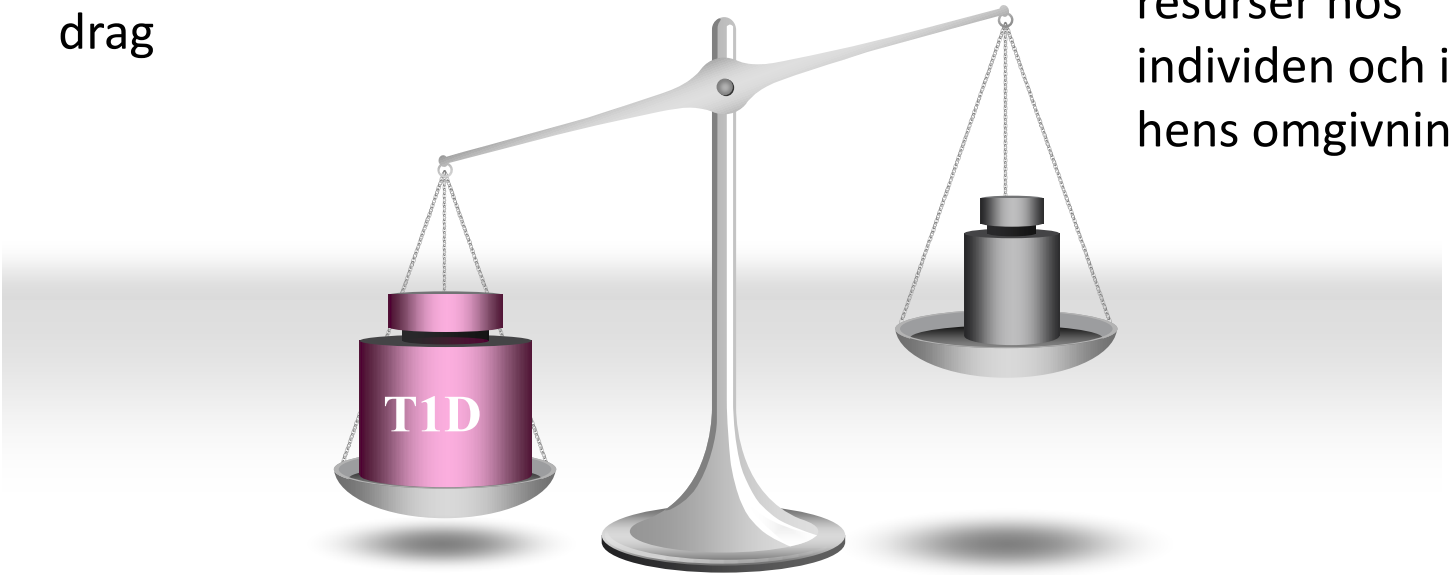
Neuropsykiatriska drag

Tillgängliga resurser hos individen och i hens omgivning



Neuropsykiatriska drag

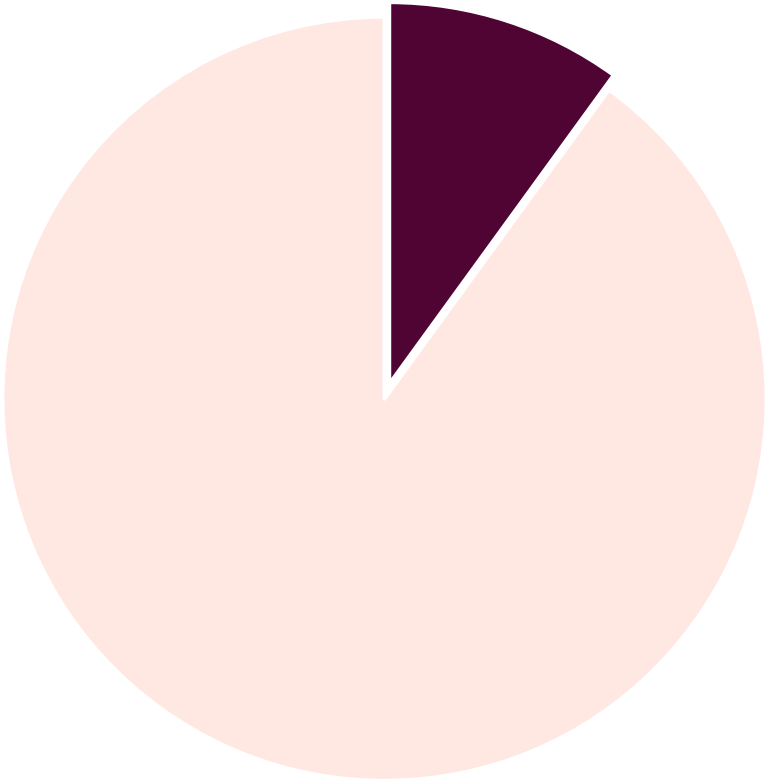
Tillgängliga resurser hos individen och i hens omgivning



Neuropsykiatriska drag i kombination med funktionsnedsättning kan leda till en diagnos.

ADHD (Attention Deficit/Hyperactivity Disorder)

- Ca 5-10 % av svenska befolkningen.



Ouppmärksamhet

Slarvfel

Svårt att hålla fokus

Svårt att lyssna

Svårt att organisera

Glömmer, tappar bort saker

Motstånd inför uppgifter

Hyperaktivitet och impulsivitet

Svårt att vara stilla

Svårt att vänta

Impulsiv

Högt tempo

Rastlös, i ständig rörelse

frontiers | Frontiers in Pediatrics

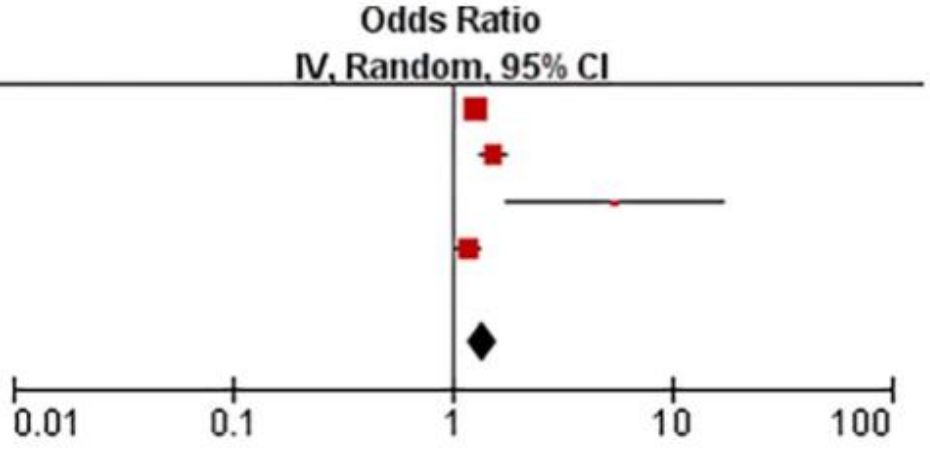
The relationship between diabetes mellitus and attention deficit hyperactivity disorder: A systematic review and meta-analysis

Yuan Ai[1,2], Jing Zhao[1,2]*, Hanmin Liu[1,2], Jiao Li[1,2] and Tingting Zhu[1,2]*

A

Study	Weight	Odds Ratio IV, Random, 95% CI
Akmatov 2019	35.7%	1.30 [1.20, 1.40]
Butwicka 2015	30.6%	1.55 [1.35, 1.77]
Chen HJ 2013	1.9%	5.52 [1.78, 17.14]
Kapellen 2016	31.7%	1.19 [1.06, 1.35]
Total (95% CI)	**100.0%**	**1.37 [1.17, 1.61]**

Heterogeneity: $Tau^2 = 0.02$;
$Chi^2 = 14.30$, $df = 3$ ($P = 0.003$); $I^2 = 79\%$



OXFORD ACADEMIC

JCEM THE JOURNAL OF CLINICAL ENDOCRINOLOGY & METABOLISM

ENDOCRINE SOCIETY

Neurodevelopmental Disorders, Glycemic Control, and Diabetic Complications in Type 1 Diabetes: a Nationwide Cohort Study

Shengxin Liu ✉, Ralf Kuja-Halkola, Henrik Larsson, Paul Lichtenstein, Jonas F Ludvigsson, Ann-Marie Svensson, Soffia Gudbjörnsdottir, Magnus Tideman, Eva Serlachius, Agnieszka Butwicka

The Journal of Clinical Endocrinology & Metabolism, Volume 106, Issue 11, November 2021, Pages e4459–e4470, https://doi.org/10.1210/clinem/dgab467

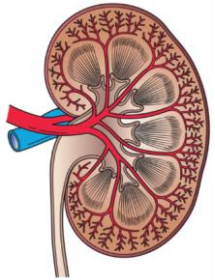
ADHD vid diabetes typ 1

Table 2. Comparison of glycemic control between childhood-onset type 1 diabetes patients with and without comorbid neurodevelopmental disorders

Comorbid diagnosis of neurodevelopmental disorder	Mean HbA1c (SD)		Adjusted model[b]		
	%	mmol/mol	6.6%-7.5% 49-59 mmol/mol) vs ≤6.5% (≤48 mmol/mol)	7.6%-8.5% (60-69 mmol/mol) vs ≤6.5% (≤48 mmol/mol)	>8.5% (>69 mmol/mol) vs ≤6.5% (≤48 mmol/mol)
No neurodevelopmental disorder	7.7 (1.1)	60.6 (11.6)	1 (ref)	1 (ref)	1 (ref)
Any neurodevelopmental disorder	8.1 (1.3)	64.8 (13.7)	0.84 (0.63, 1.12)	1.30 (0.98, 1.72)	1.51 (1.13, 2.03)
Attention-deficit/hyperactivity disorder	8.3 (1.3)	66.7 (14.1)	0.87 (0.58, 1.30)	1.56 (1.05, 2.30)	2.31 (1.54, 3.45)
Autism spectrum disorder	7.7 (1.1)	60.8 (11.7)	0.78 (0.38, 1.57)	0.88 (0.43, 1.78)	0.58 (0.26, 1.30)
Intellectual disability	8.0 (1.2)	63.5 (13.0)	1.00 (0.42, 2.41)	1.08 (0.45, 2.60)	1.41 (0.57, 3.49)

[b]Additionally adjusted for sex, age at diabetes diagnosis, year of birth and year of diabetes diagnosis, other psychiatric morbidity, smoking status, mean BMI, mean systolic and diastolic blood pressure, parental highes ucation level, and parental psychiatric morbidity.

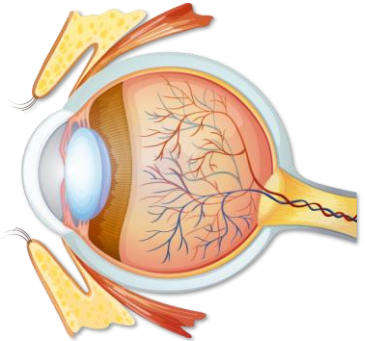
ADHD vid diabetes typ 1 – risk för nefropati



	Number of outcomes/ person-years	IR (95% CI)	Model 3[c], HR (95% CI)
No neurodevelopmental disorder	416/81,141	5.13 (4.65, 5.64)	1 (ref)
Any neurodevelopmental disorder	43/6154	6.99 (5.06, 9.41)	1.72 (1.21, 2.44)
Attention-deficit/hyperactivity disorder	24/3266	7.35 (4.71, 10.93)	1.90 (1.20, 3.00)
Autism spectrum disorder	4/726	5.51 (1.50, 14.10)	0.79 (0.19, 3.18)
Intellectual disability	8/604	13.24 (5.72, 26.09)	2.64 (1.30, 5.37)

[a]Model 1: Cox model adjusted for sex, age at diabetes diagnosis, year of birth and year of diabetes diagnosis, other psychiatric morbidity, parental highest education level and parental psychiatric morbidity.
[b]Model 2: Additionally adjusted for mean HbA1c levels.
[c]Model 3: Additionally adjusted for mean BMI, systolic and diastolic blood pressure, and smoking status.

ADHD vid diabetes typ 1 – risk för retinopati



	Number of outcomes /person-years	IR (95% CI)	Model 3[c], HR (95% CI)
No neurodevelopmental disorder	2429/74,082	32.79 (31.50, 34.12)	1 (ref)
Any neurodevelopmental disorder	199/5632	35.33 (30.60, 40.60)	1.18 (1.00, 1.40)
Attention-deficit/hyperactivity disorder	110/3001	36.66 (30.13, 44.18)	1.33 (1.07, 1.66)
Autism spectrum disorder	27/668	40.42 (26.63, 58.81)	1.34 (0.85, 2.12)
Intellectual disability	16/633	28.93 (16.53, 46.98)	0.73 (0.41, 1.28)

[a]Model 1: Cox model adjusted for sex, age at diabetes diagnosis, year of birth and year of diabetes diagnosis, other psychiatric morbidity, parental highest education level and parental psychiatric morbidity.
[b]Model 2: Additionally adjusted for mean HbA1c levels.
[c]Model 3: Additionally adjusted for mean BMI, systolic and diastolic blood pressure, and smoking status.

diabetesresearchandclinicalpractice 209 (2024) 111566

Contents lists available at ScienceDirect

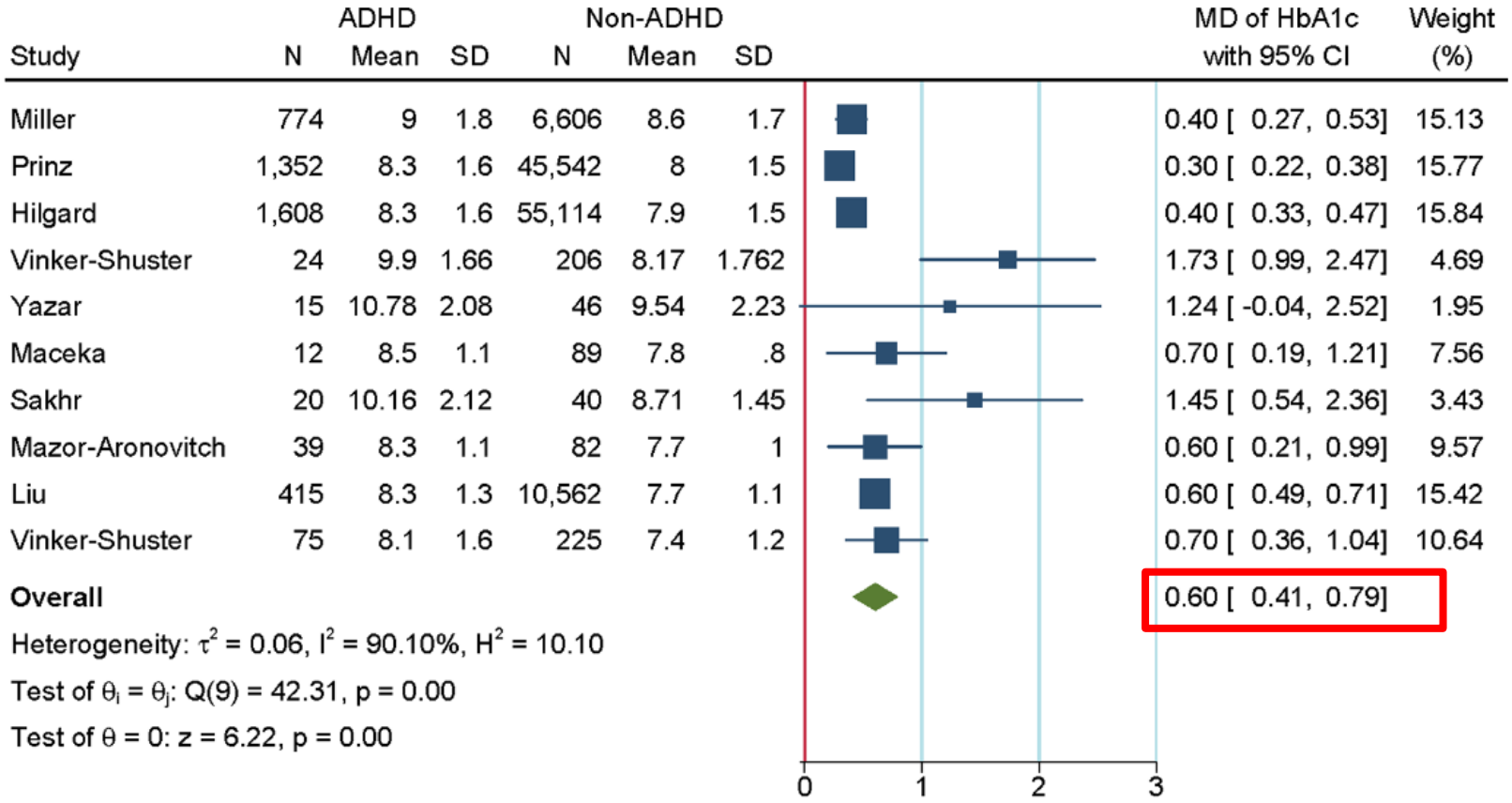
Diabetes Research and Clinical Practice

journal homepage: www.journals.elsevier.com/diabetes-research-and-clinical-practice

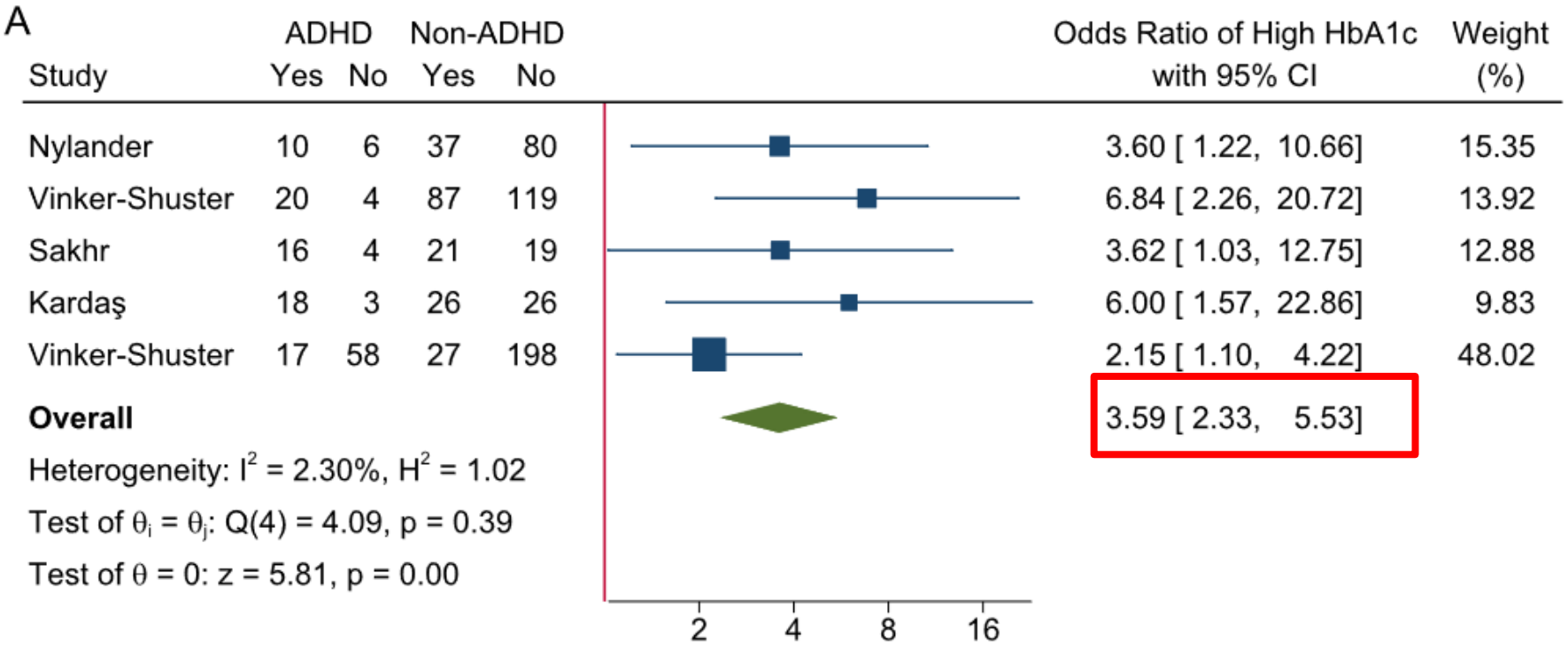
Effects of ADHD and ADHD treatment on glycemic management in type 1 diabetes: A systematic review and meta-analysis of observational studies

Ali Zare Dehnavi [a,b,1], Islam Elmitwalli [c,1], Hisham O.H. Alsharif [d], Ali Shervin Razavi [e], Tyler A. Gumpel [e], Abigail Smith [f], Ruth S. Weinstock [g,h], Stephen V. Faraone [i,j], Yanli Zhang-James [i,*]

ADHD vid diabetes typ 1 –högre HbA1c

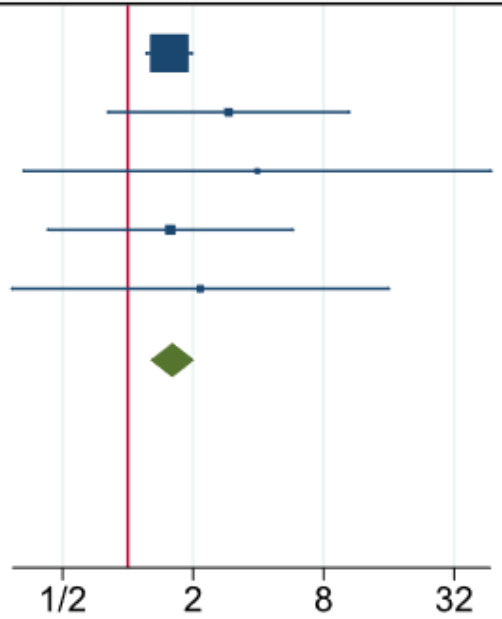


ADHD vid diabetes typ 1 –risk för höga HbA1c



ADHD vid diabetes typ 1 – ökad risk för hypoglykemi

B



Study	ADHD Yes	ADHD No	Non-ADHD Yes	Non-ADHD No	Odds Ratio of Hypoglycemia with 95% CI	Weight (%)
Miller	86	688	492	6,114	1.55 [1.22, 1.98]	92.61
Nylander	4	12	12	105	2.92 [0.81, 10.49]	2.19
Maceka	1	11	2	87	3.95 [0.33, 47.27]	0.44
Sakhr	5	15	7	33	1.57 [0.43, 5.77]	3.53
Mazor-Aronovitch	2	37	2	80	2.16 [0.29, 15.95]	1.23
Overall					1.60 [1.27, 2.02]	

Heterogeneity: $I^2 = 0.00\%$, $H^2 = 1.00$

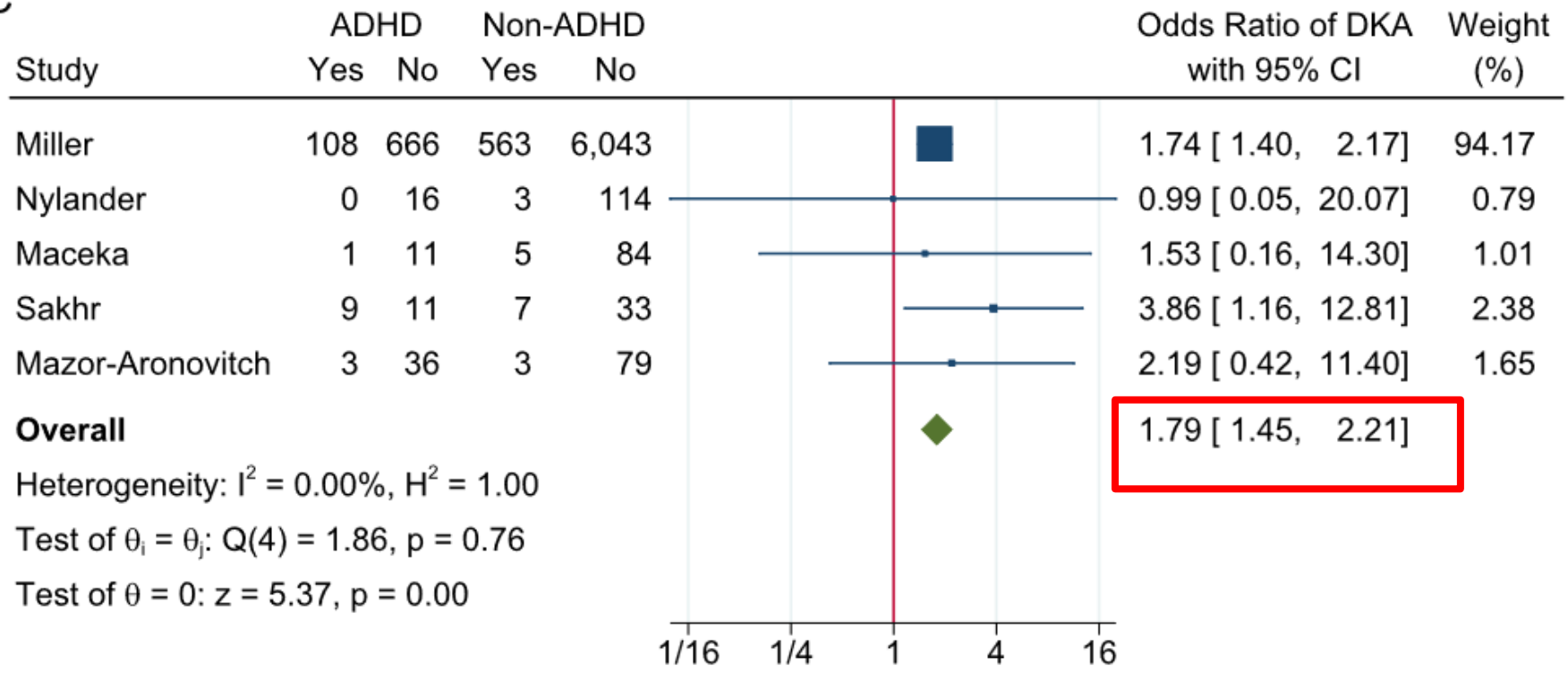
Test of $\theta_i = \theta_j$: Q(4) = 1.50, p = 0.83

Test of $\theta = 0$: z = 4.00, p = 0.00

Fixed-effects Mantel–Haenszel model
Sorted by: PublicationYear

ADHD vid diabetes typ 1 – ökad risk för ketoacidos

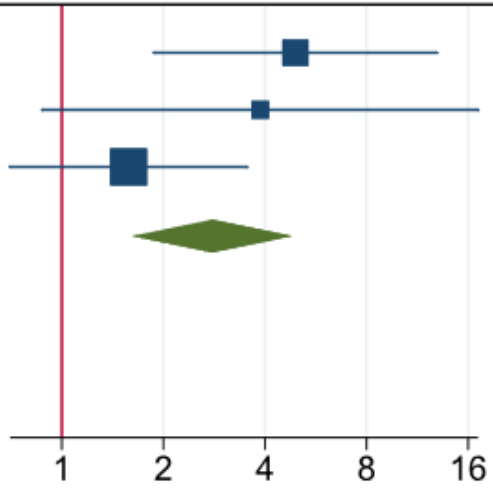
C



Fixed-effects Mantel-Haenszel model

ADHD vid diabetes typ 1 – ökad risk för sjukhusinläggning

D



Study	ADHD Yes	ADHD No	Non-ADHD Yes	Non-ADHD No	Odds Ratio of Hospitalization with 95% CI	Weight (%)
Vinker-Shuster	18	6	78	128	4.92 [1.87, 12.93]	28.22
Mazor-Aronovitch	5	34	3	79	3.87 [0.88, 17.13]	11.69
Vinker-Shuster	10	65	20	205	1.58 [0.70, 3.54]	60.09
Overall					2.79 [1.61, 4.82]	

Heterogeneity: I^2 = 41.63%, H^2 = 1.71

Test of $\theta_i = \theta_j$: Q(2) = 3.43, p = 0.18

Test of θ = 0: z = 3.67, p = 0.00

Fixed-effects Mantel–Haenszel model
Sorted by: PublicationYear

Nationella vård- och insatsprogram

Läkemedelsbehandling

Individer med adhd utan andra psykiatriska tillstånd bör erbjudas behandling med läkemedel av typen centralt verkande sympatomimetika om inga kontraindikationer föreligger. Vid adhd i kombination med andra psykiatriska tillstånd kan läkemedelsbehandling erbjudas, men med större försiktighet. Läkemedelsbehandlingen bör alltid erbjudas som del i en multimodal behandling.

Läkemedelsverkets rekommendationer i prioritetsordning

Barn och ungdomar

1. Metylfenidat. I vissa fall atomoxetin.
2. Atomoxetin alternativt lisdexamfetamin.
3. Guanfacin.

Dexamfetamin tas inte med i prioriteringsordningen.

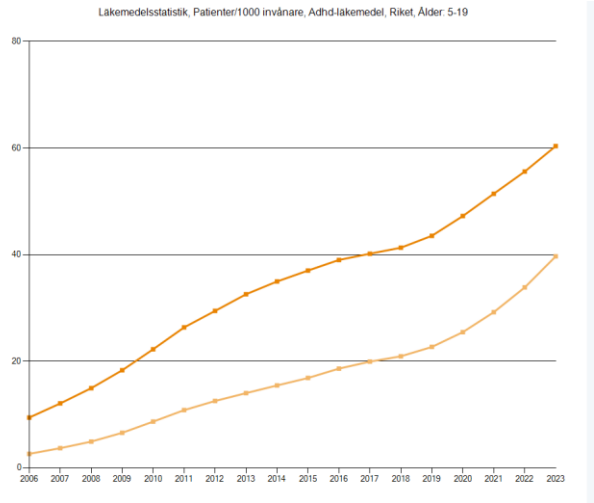
Vuxna

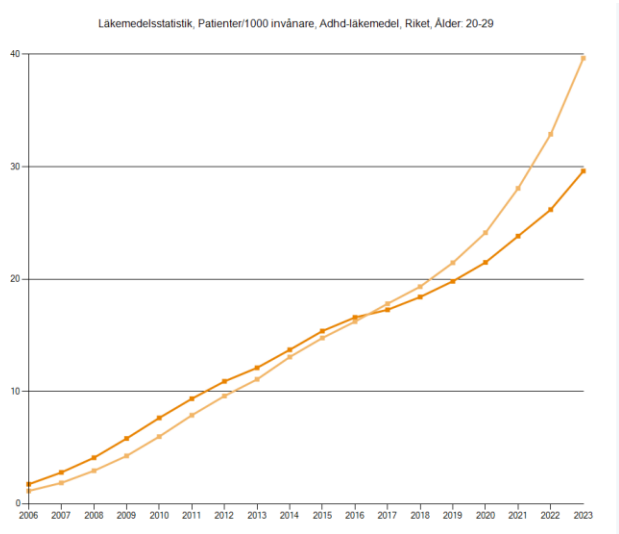
1. Metylfenidat. I vissa fall atomoxetin.
2. Lisdexamfetamin.

Guanfacin och dexamfetamin är inte godkända för vuxna.

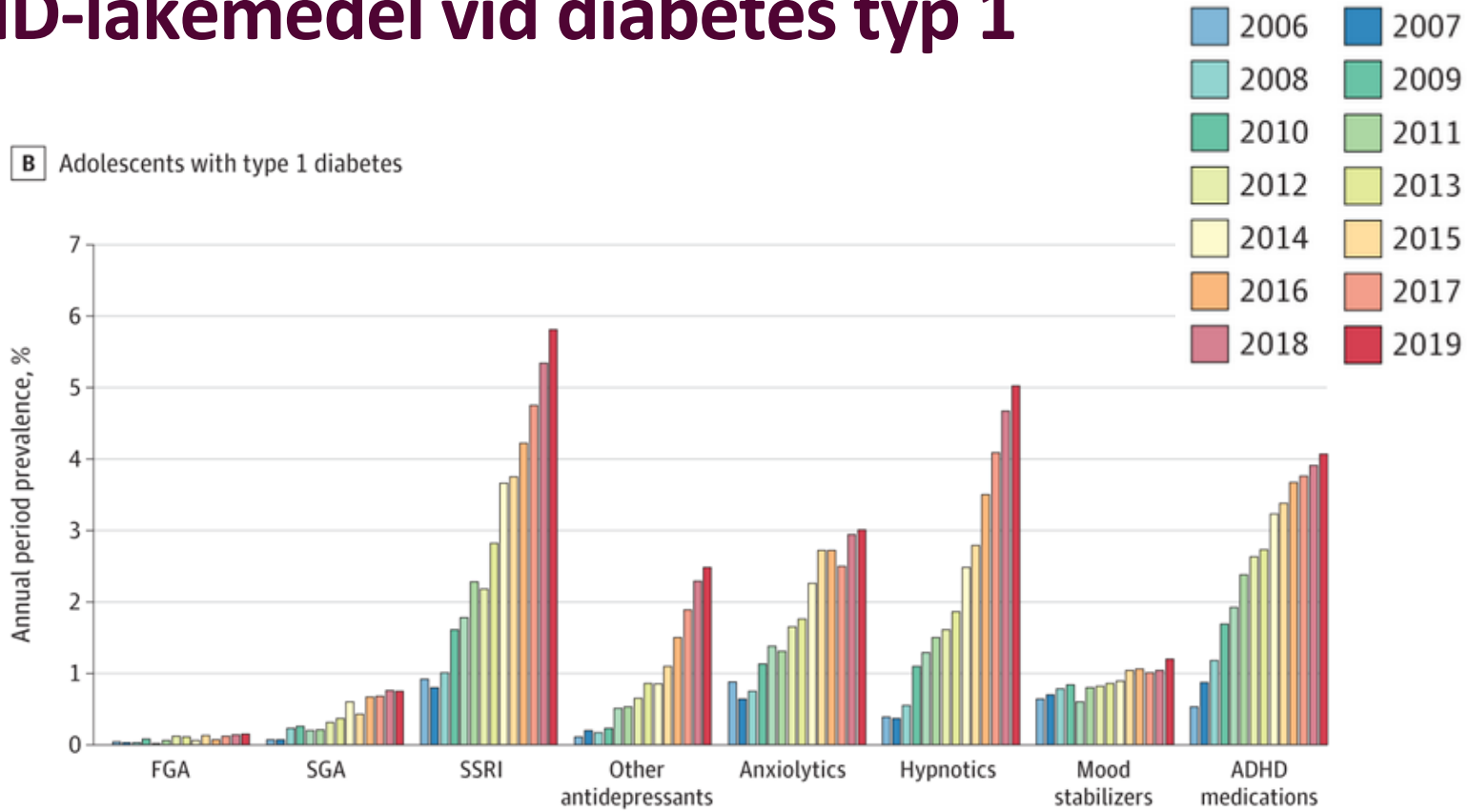
ADHD (Attention Deficit/Hyperactivity Disorder)

- Förskrivningarna av adhd-mediciner har ökat kraftigt på senare år.





ADHD-läkemedel vid diabetes typ 1



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Evidens för ADHD-läkemedel vid diabetes typ 1

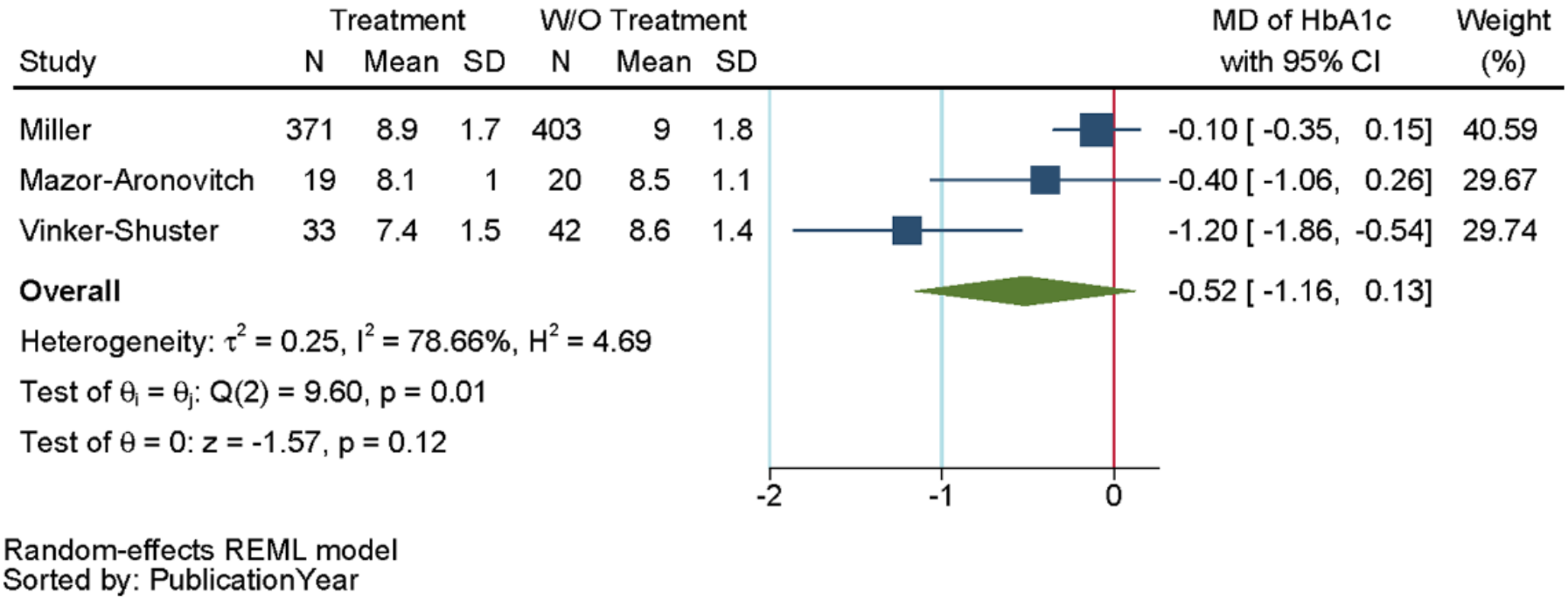


Fig. 4 The forest plot of studies for investigating the effect of ADHD treatment on HbA1c levels in individuals diagnosed with T1D and ADHD

Evidens för ADHD-läkemedel vid diabetes typ 1

- Biverkningar: Vissa studier rapporterar högt blodtryck, men ingen tydlig skillnad i metabol kontroll.

- Begränsningar:
  Små urval
  Begränsad generaliserbarhet.
  Inga RCT-studier
  Ingen direkt jämförelse mellan MPH och LDX

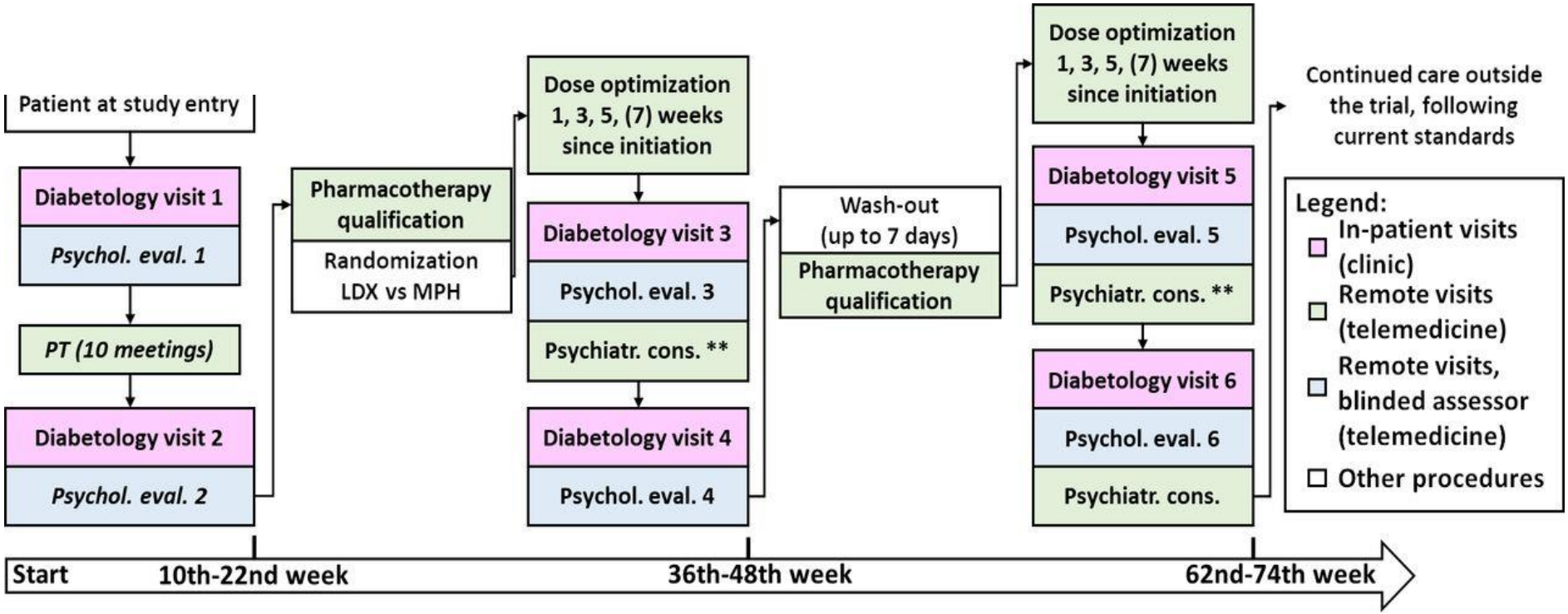
Mazor-Aronovitch K et al, *Pediatr Diabetes* 2021; Hilgard D Pediatr Diabetes 2017, Kapellen TM, J Pediatr Endocrinol Metab 2016

Paediatrics
Protocol

Lisdexamphetamine versus methylphenidate for paediatric patients with attention-deficit hyperactivity disorder and type 1 diabetes (LAMAinDiab): protocol for a multicentre, randomised cross-over clinical trial in an outpatient telemedicine-supported setting

Arkadiusz Michalak [1, 2, 3], Jędrzej Chrzanowski [1], Hanna Kuśmierczyk-Kozieł [2], Ewa Klejman [1], Katarzyna Błaziak [3], Beata Mianowska [2], Agnieszka Szadkowska [2], Agata P Chobot [4, 5], Przemysława Jarosz-Chobot [6], Małgorzata Myśliwiec [7], Iwona Makowska [8, 9], Anna Kalenik [10], Monika Zamarlik [11, 12], Tomasz Wolańczyk [10], Wojciech Fendler [1, 3], Agnieszka Butwicka [1, 13, 14, 15]

Simplified study design flowchart.



Arkadiusz Michalak et al. BMJ Open 2023;13:e078112

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BMJ Open

Rekrytering status i februari

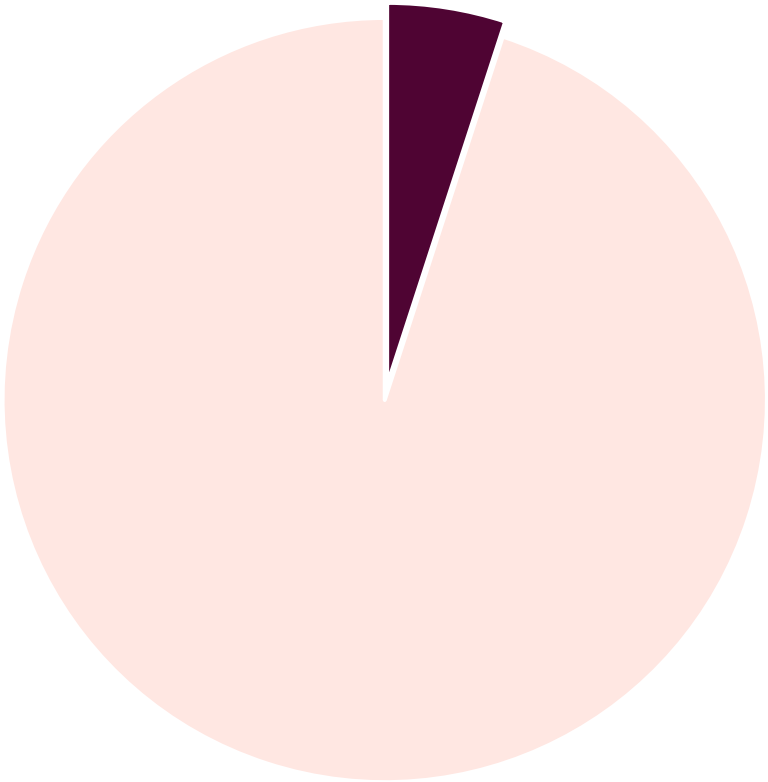
- **Rekrytering totalt**: 37 barn rekryterades till studien.
- **Tackade Nej**: 9 barn valde att inte delta i studien.
- **Nej till läkemedelsbehandling**: 6 barn
- **Påbörjade läkemedelsbehandling**: 11 barn

Utmaningar i studien

- Höga blodtrycksvärden → ofta krävs ytterligare undersökningar. 24-timmars blodtrycksmätning viktig för att få en helhetsbild av patientens blodtrycksvariationer.
- Samsjuklighet → celiaki, järnbrist, epilepsi, kortvuxenhet, undervikt, hypotyreos
- Bristande följsamhet → Bortglömda besök, oregelbunden medicinering, problem med blodtrycksmätningar, svårigheter med att överföra resultat, patienter flyttar mellan regioner
- Rekryteringsproblem → Negativ inställning till farmakabehandling, kontakt brist med vårdanshavare som är inte i bilden.

Autism

- 1–5 % av befolkningen



Socialt samspel

Beteenden och intressen

Autism vid diabetes typ 1

Registerstudier:

Ingen signifikant skillnad i HbA1c hos personer med autism

Ingen ökad risk för komplikationer

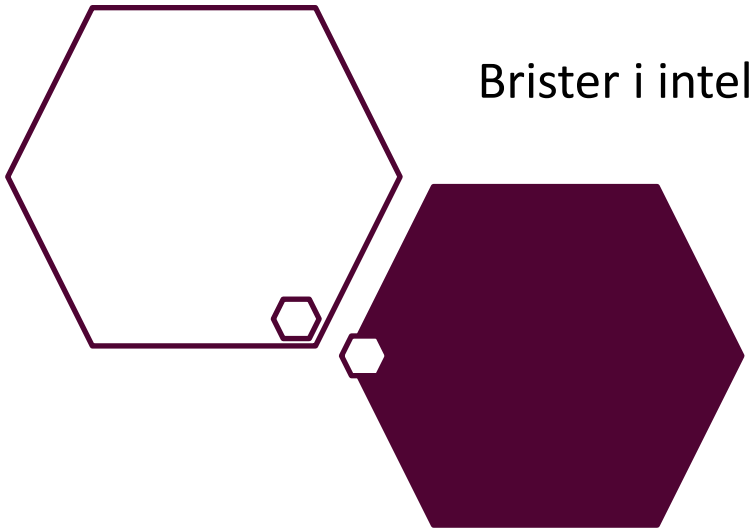
Autism har studerats betydligt mindre än ADHD inom diabetesforskning

Komplex sjukdomsbild, fler mediciner, selektivt matintag, starkt behov av rutiner

→ ökat vårdbehov

Intellektuell funktionsnedsättning (IF)

- Ca 1-2 % av befolkningen.



Brister i intellektuell funktion

Nedsatt adaptiv förmåga

Intellektuell funktionsnedsättning (IF) vid diabetes typ 1

- Brist på forskning om egenvård vid diabetes och IF
- Personer ofta från forskning om diabetes och egenvård

IF vid diabetes typ 1 – HbA1c

Table 2. Comparison of glycemic control between childhood-onset type 1 diabetes patients with and without comorbid neurodevelopmental disorders

Comorbid diagnosis of neurodevelopmental disorder	Mean HbA1c (SD)		Adjusted model[b]		
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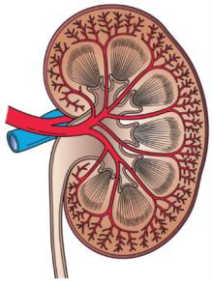
Any neurodevelopmental disorder	8.1 (1.3)	64.8 (13.7)	0.84 (0.63, 1.12)	1.30 (0.98, 1.72)	1.51 (1.13, 2.03)
Attention-deficit/hyperactivity disorder	8.3 (1.3)	66.7 (14.1)	0.87 (0.58, 1.30)	1.56 (1.05, 2.30)	2.31 (1.54, 3.45)
Autism spectrum disorder	7.7 (1.1)	60.8 (11.7)	0.78 (0.38, 1.57)	0.88 (0.43, 1.78)	0.58 (0.26, 1.30)
Intellectual disability	8.0 (1.2)	63.5 (13.0)	1.00 (0.42, 2.41)	1.08 (0.45, 2.60)	1.41 (0.57, 3.49)

[b]Additionally adjusted for sex, age at diabetes diagnosis, year of birth and year of diabetes diagnosis, other psychiatric morbidity, smoking status, mean BMI, mean systolic and diastolic blood pressure, parental highes ucation level, and parental psychiatric morbidity.

IF vid diabetes typ 1 - nefropati



	Number of outcomes/ person-years	IR (95% CI)	Model 3[c], HR (95% CI)
No neurodevelopmental disorder	416/81,141	5.13 (4.65, 5.64)	1 (ref)
Any neurodevelopmental disorder	43/6154	6.99 (5.06, 9.41)	1.72 (1.21, 2.44)
Attention-deficit/hyperactivity disorder	24/3266	7.35 (4.71, 10.93)	1.90 (1.20, 3.00)
Autism spectrum disorder	4/726	5.51 (1.50, 14.10)	0.79 (0.19, 3.18)
Intellectual disability	8/604	13.24 (5.72, 26.09)	2.64 (1.30, 5.37)

[a]Model 1: Cox model adjusted for sex, age at diabetes diagnosis, year of birth and year of diabetes diagnosis, other psychiatric morbidity, parental highest education level and parental psychiatric morbidity.
[b]Model 2: Additionally adjusted for mean HbA1c levels.
[c]Model 3: Additionally adjusted for mean BMI, systolic and diastolic blood pressure, and smoking status.

IF vid diabetes typ 1

	No neurodevelopmenta disorder	Attention-deficit/ hyperactivity disorder	Autism spectrum disorder	Intellectual disability
Last recorded insulin administration method, n (%)				
Multiple daily injections	6267 (59.3)	265 (63.9)	48 (53.9)	56 (78.9)
Insulin pump	4105 (38.9)	147 (35.4)	40 (44.9)	13 (18.3)
Missing	189 (1.8)	3 (0.7)	1 (1.1)	2 (2.8)

Diabetologia (2010) 53:1070–1075
DOI 10.1007/s00125-010-1686-z

ARTICLE

Down's syndrome in diabetic patients aged <20 years: an analysis of metabolic status, glycaemic control and autoimmunity in comparison with type 1 diabetes

T. R. Rohrer · P. Hennes · A. Thon · A. Dost · M. Grabert · B. Rami · S. Wiegand · R. W. Holl · on behalf of the DPV Initiative

Variable	Down's+diabetes	Type 1 diabetes only	*p* value	*p* value corrected
Patient total (*n*)	159	41,983		
HbA_{1c} (%)	7.8±1.4	8.5±1.8	<0.001	<0.001
HbA_{1c}-DCCT	7.6±1.4	8.3±1.8	<0.001	<0.001

Characteristics of type 1 diabetes mellitus in children and adolescents with Down's syndrome in an admixed population

Arch Endocrinol Metab. 2021;65/5

Table 1. Comparison of the clinical and laboratory profile of the groups

	T1D+DS	T1D Controls	P
N = 27 patients	9	18	
Age – years (SD)	9.7 (3.1)	9.6 (3.0)	0.991
Gender (M/F)	4/5	8/10	1.000
Puberty – n (%)	4 (44.4%)	10 (55.5%)	0.695
Age at diagnosis – years (SD)	4.9 (3.9)	6.4 (3.0)	0.282
Age at diagnosis < 2 years old - n (%)	3 (33%)	1 (5.5%)	0.093
Height Z – SDS	-2.71 (1.1)	-0.22 (0.9)	<0.001
BMI Z – SDS	0.4 (-0.05 to 0.9)	0,3 (-0.02 to 0.9)	0.979
DKA at diagnosis – n (%)	5 (55.5%)	10 (55.5%)	0.861
HbA1c – % (SD)	7.2 (0.6)	9.1 (2.0)	0.047
Total insulin – IU/kg/day (SD)	0.7 (0.2)	1.0 (0.3)	0.022

Data are shown as mean ± SD and median (min and max range) for numerical variables. Categorical variables are shown as absolute numbers (percentage). Abbreviations: BMI, body mass index; SDS, standard deviation score; DKA, diabetic ketoacidosis; HbA1c, glycated hemoglobin.

ISPAD Clinical Practice Consensus Guidelines 2022: Psychological care of children, adolescents and young adults with diabetes

6 | NEUROCOGNITIVE FUNCTIONING

- Interdisciplinary diabetes teams should be aware of risk and protective factors for neurocognitive deficits in youth with all types of diabetes.
- Ideally, questionnaire- or performance-based measures of **neurocognitive the function should be available for assessment** by a mental health specialist when youth with diabetes are at risk and when they show signs of neurocognitive deficits in dealing with their diabetes self-management tasks (e.g., planning, prioritizing).

Ska vi aktivt bedöma neuropsykiatriska svårigheter/skreena kring NPF vid T1D?

DOI: 10.1111/pedi.12651

WILEY ISPAD

ORIGINAL ARTICLE

Previously undiagnosed attention-deficit/hyperactivity disorder associated with poor metabolic control in adolescents with type 1 diabetes

C Nylander[1,2] | K Lindström[3] | N Khalifa[4,5] | E Fernell[6]

En svensk studie vid tre kliniker i Stockholm och Uppsala

- Totalt 166 patienter (12–18-år) med T1D
- 49 exekutiva svårigheter: 7 ADHD-diagnos, 13 genomgick klinisk bedömning
- 9 av 13 (6 flickor) uppfyllde kriterierna för ADHD
- HbA1c >70 mmol/mol var associerat med ADHD, OR 2,96
- **Patienter som diagnostiserades inom studien hade oftare höga HbA1c-nivåer jämfört med barn med behandlade ADHD**.
- **Bristande diabeteskontroll** kan vara kopplad till oupptäckt neuropsykiatrisk problematik. Flickor med dålig metabol kontroll behöver särskild uppmärksamhet

Diabetes typ 1 i och risken för NFP

Diabetologia (2021) 64:767–777
https://doi.org/10.1007/s00125-020-05372-5

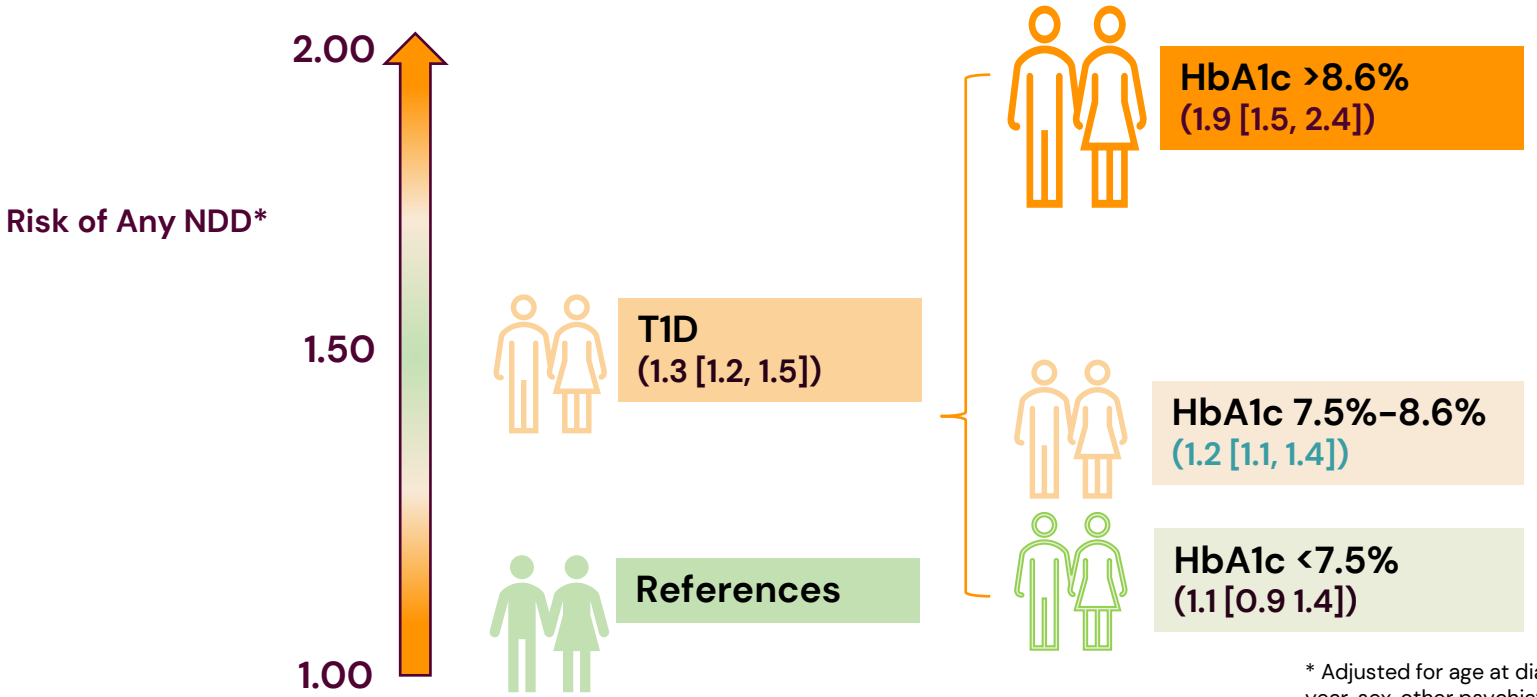
ARTICLE

Check for updates

Poor glycaemic control is associated with increased risk of neurodevelopmental disorders in childhood-onset type 1 diabetes: a population-based cohort study

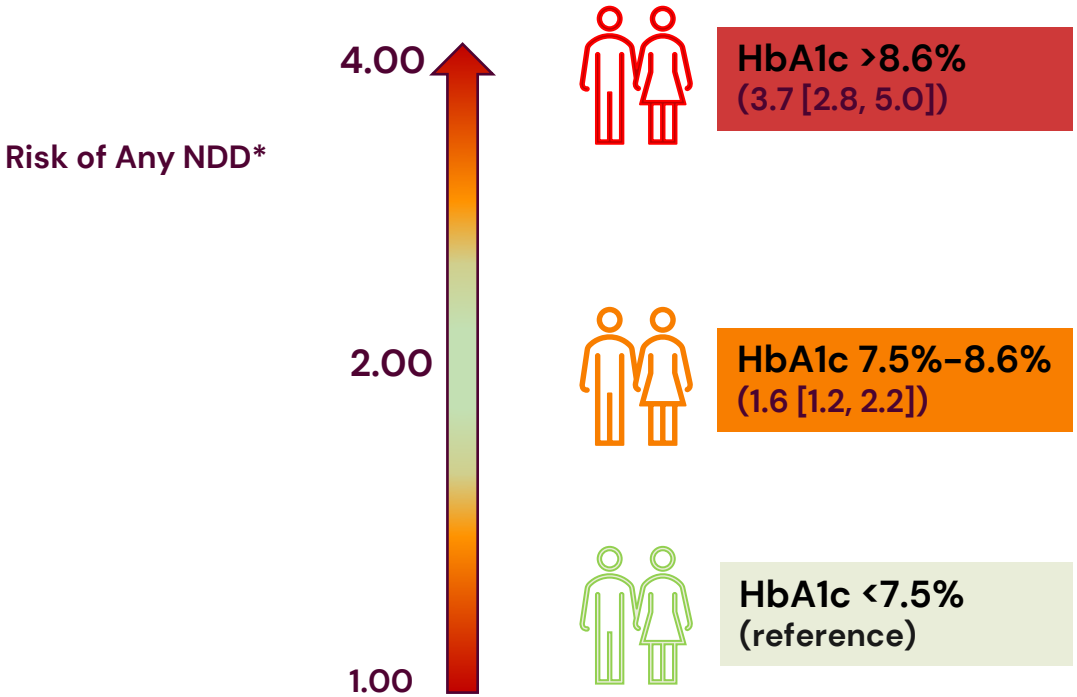
Shengxin Liu[1] · Ralf Kuja-Halkola[1] · Henrik Larsson[1,2] · Paul Lichtenstein[1] · Jonas F. Ludvigsson[1,3,4,5] · Ann-Marie Svensson[6,7] · Soffia Gudbjörnsdottir[6,7] · Magnus Tideman[8] · Eva Serlachius[9] · Agnieszka Butwicka[1,9,10]

Diabetes typ 1 i och risken för NPF



* Adjusted for age at diabetes diagnosis, birth year, sex, other psychiatric morbidity before inclusion, parental psychiatric morbidity and parent highest education level.

Diabetes typ 1 i och risken för NPF



* Adjusted for age at diabetes diagnosis, birth year, sex, other psychiatric morbidity before inclusion, parental psychiatric morbidity and parent highest education level.

NORDIC JOURNAL OF PSYCHIATRY
2025, VOL. 79, NO. 2, 136–145
https://doi.org/10.1080/08039488.2025.2455555

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ARTICLE

OPEN ACCESS Check for updates

Multicenter screening for ADHD among school-age pediatric patients with type 1 diabetes – study protocol

Hanna Kuśmierczyk-Kozieł[a#], Arkadiusz Michalak[a,b,c#], Jędrzej Chrzanowski[b], Katarzyna Błaziak[c], Beata Mianowska[a], Agnieszka Szadkowska[a], Agata Chobot[d,e], Przemysława Jarosz-Chobot[f], Małgorzata Myśliwiec[g], Iwona Makowska[h], Anna Kalenik[i], Marcin Rzeszutek[i], Monika Zamarlik[j,k], Ewa Rusak[f], Anna Kaczmarek[a], Aleksandra Nowak[a], Magdalena Połaniecka[g], Malwina Musiał-Paździor[g], Klaudia Szmigiel[f], Anna Sobota-Krawczyk[d], Marta Rutkowska[f], Tomasz Wolańczyk[i], Wojciech Fendler[b,c,l] and Agnieszka Butwicka[b,m,n,o]

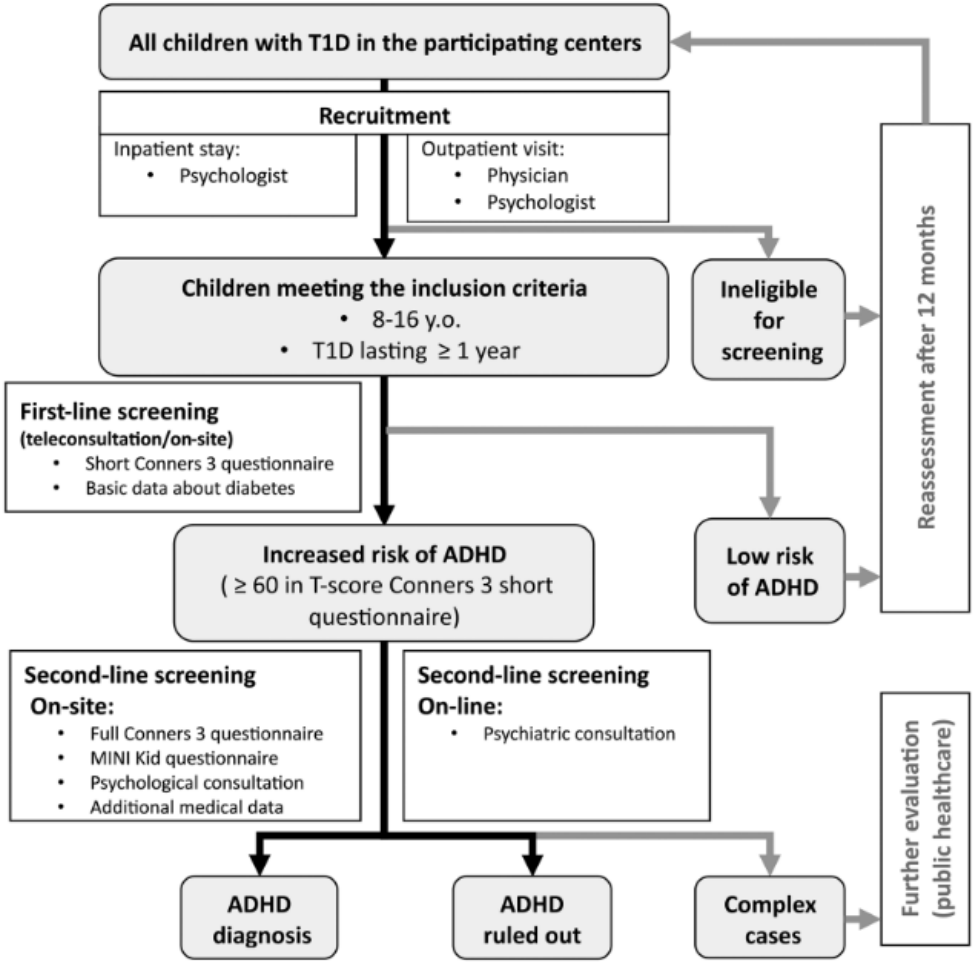
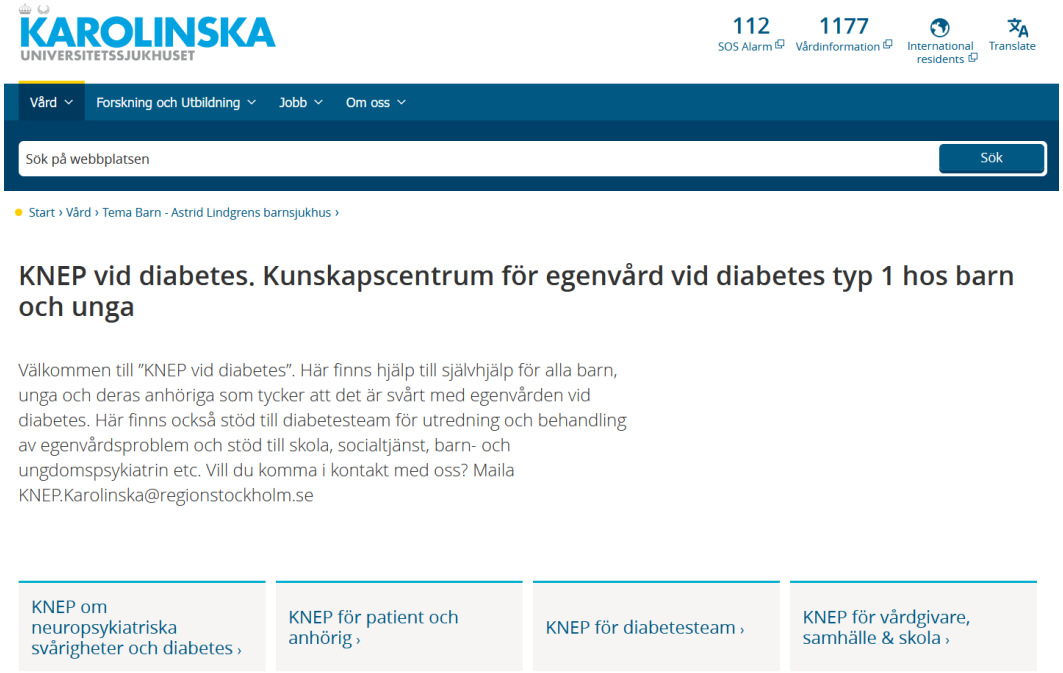


Figure 1. Expected flowchart of study participants. Grey boxes present the study population at specific stages; white include a summary of screening procedures and decision-making points.

- https://www.karolinska.se/NEP

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