DKA in diabetes: a multinational comparison of 59,191 paediatric patients from England, Wales, United States, Austria and Germany.

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Introduction

DKA in children and adolescents with established Type 1 Diabetes:
- is a major problem with considerable cost to patients, families and health care systems
- can be considered as a quality of care indicator and a failure of relationship between the care provider and the family/patient
- has considerable variability in rates recognised both nationally and internationally.
- We analysed multicenter registry and audit data from 5 countries with similarly advanced, yet differing, healthcare systems where data on DKA admissions are routinely collected.
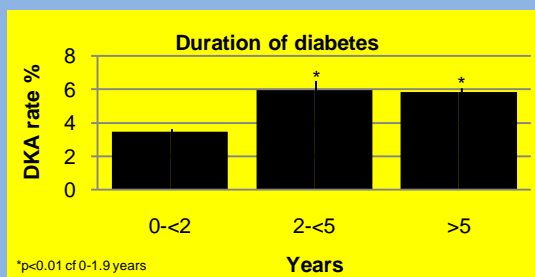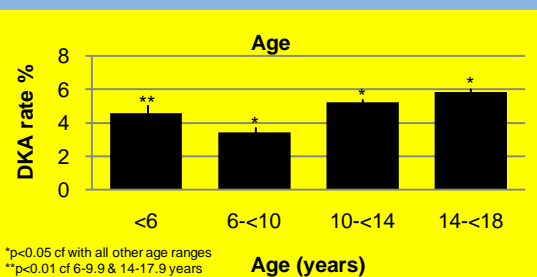
Methods and Objectives

Data from 59,191 individuals <18 years with T1D 2011-12:
- T1D Exchange (T1DX, n=13,966, United States of America)
- National Pediatric Diabetes Audit (NPDA, n=18,963, England and Wales)
- DPV initiative (n=26,262, Germany and Austria)
- DKA was defined as ≥1 hospitalisation with a pH<7.3 during the prior year. Data were analysed using multivariable logistic regression models for the whole population.

Results

	Overall	DPV	NPDA	T1DX	Germany	Austria	England	Wales	P
N	59,191	26,262	18,963	13,966	24,483	1,779	17,726	1,237	
% male	52.5	52.7	52.9	51.6	52.5	54.5	53.0	52.4	NS
Age (SD)	11.8 (3.9)	11.5 (4.1)	12.2 (3.7)	11.8 (3.9)	11.5 (4.1)	11.3 (4.3)	12.2 (3.7)	12.4 (3.7)	<0.001
Age diagnosis (SD)	7.4 (4.0)	7.7 (4.1)	7.4 (3.9)	6.8 (4.0)	7.7 (4.1)	7.6 (4.2)	7.4 (3.9)	7.4 (3.9)	<0.001
Duration (SD)	4.2 (3.7)	3.8 (3.7)	4.8 (3.6)	4.1 (3.8)	3.8 (3.7)	3.9 (3.9)	4.8 (3.6)	5.0 (3.6)	<0.001
% on pump	32.6	40.9	10.6	47.0	40.9	40.5	10.6	11.6	<0.001
% ethnic minority	21.7	20.0	23.8	22.2	19.6	26.2	25.1	4.1	<0.001
HbA1c mmol/mol (SD)	68 (17)	64 (17)	74 (17.2)	68 (15)	64 (17)	64 (17)	74 (17)	74 (18)	<0.001
HbA1c % (SD)	8.4 (1.6)	8.0 (1.6)	8.9 (1.6)	8.4 (1.4)	8.0 (1.6)	8.0 (1.5)	8.9 (1.6)	8.9 (1.6)	<0.001
% <58mmol/mol (7.5%)	29.9	42.8	14.4	24.7	42.8	43.0	14.4	14.1	<0.001
% DKA	5.3	4.5	5.9	6.2	4.5	3.3	6.0	4.4	<0.005

Age

*p<0.05 cf with all other age ranges
**p<0.01 cf 6-9.9 & 14-17.9 years

Duration of diabetes

*p<0.01 cf 0-1.9 years

Odds ratio Gender F:M		
All	1.34	1.24-1.44
USA	1.25	1.09-1.44
Germany	1.25	1.11-1.42
Austria	0.94	0.55-1.61
England	1.48	1.31-1.68
Wales	0.49	0.27-0.86
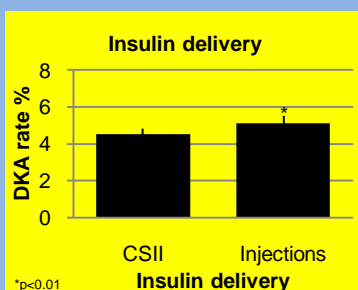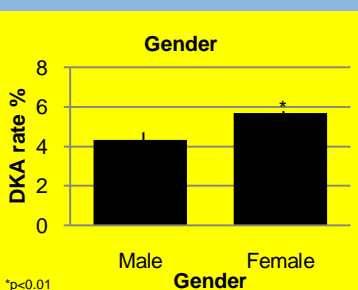
Odds ratio Ethnicity Yes:No		
All	1.32	1.21-1.43
USA	1.52	1.31-1.77
Germany	1.37	1.19-1.58
Austria	3.40	1.99-5.83
England	1.02	0.88-1.18
Wales	1.66	0.48-5.71

Gender

*p<0.01

Ethnicity

*p<0.01

Insulin delivery

*p<0.01

Odds ratio Insulin CSII:Injection		
All	0.88	0.81-0.96
USA	0.55	0.47-0.64
Germany	1.11	0.98-1.26
Austria	1.81	1.05-3.16
England	1.19	0.98-1.44
Wales	0.57	0.2-1.62

Conclusion

These multicentre data demonstrate important differences in DKA in childhood T1D across three registries and five nations. Benchmarking such data are important so countries can better understand where to target interventions to improve quality of care.

RCPCH — Royal College of Paediatrics and Child Health — Leading the way in Children's Health

NPDA — National Paediatric Diabetes Audit

HQIP — Healthcare Quality Improvement Partnership

DPV — QS-DPV — DPV-Wiss

T1D Exchange