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The North Jutland County Diabetic Retinopathy Study (NCDRS) Population Characteristics

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Purpose

Several population based studies have reported blood glucose and blood pressure to be risk factors for development of proliferative retinopathy and diabetic maculopathy. These studies were initiated decades ago and may therefore reflect treatment and composition of a previous era. This study included the present diabetic population in the County of North Jutland, Denmark.

Methods

This cross-section study included 656 type 1 and 328 type 2 diabetic subjects undergoing retinopathy screening in the county of North Jutland in the period 1st April 2000 to 30th April 2004. Type 1 diabetic subjects were nearly entirely included from larger Aalborg (an urban area in the County of North Jutland) representing 70-75 % of all type 1 diabetic subjects. Type 2 diabetic subjects were enrolled from the entire County and comprised less than 5 % of all type 2 diabetic subjects.
Crude prevalence rates for several retinal manifestations are presented together with their association to an internationally approved retinopathy scale [1].

Retinopathy grading

Level	Definition
0	No retinal abnormality
1	Microaneurysms only
2	More than just microaneurysms but less than level 3
3	Any of the following: 20 or more intraretinal haemorrhages in each of the 4quadrants; definite venous beading in 2 or more quadrants; prominent IRMA in one or more quadrant and no sign of proliferative retinopathy
4a	Newly diagnosed neovascularization without signs or history of laser treatment
4b	Visibly previous laser treatment or history of such treatment

Definition of macular oedema

Clinically significant macular oedema
The presence or absence of clinically significant macular oedema was registered following a clinical examination and using the ETDRS criteria.

Results

Table 1
Populat1on characteristic parameters

	Type 1	Type 2 diabetes
N	656	328
Age at entry (years)	37.3	58.1
Duration of diabetes (years)	17.6	8.0
Age at diagnosis (years)	19.0	48.0
Female participants (%)	51.7 %	45.1 %
Height (cm)	172.0	171.0
Weig ht (kg)	72.0	88.0
BMI (kg/m²)	24.1	29.7
HbA1c (%)	8.3	8.1
Diastolic blood pressure	80.0	80.0
Systolic blood pressure (mmHg)	130.0	140.0
Neuropathy (%)	9.1	18.0
BP reducing medication (%)	26.2	57.6
Oral antidiabetics (%)	0.0	36.3
Insulin (%)	100	64.9
Lipid lowering medication (%)	6.7	27.1

Table 2
Visual acuity at various retinopathy levels

	Type 1 diabetes		Type 2 diabetes	
	Visual acuity	No	Visual acuity	No
All	0.90	656	0.85	328
0	1.00	303	0.90	201
1	1.00	136	0.8.	41
2	0.90	161	0.80	71
3	0.90	19	0.80	12
4a	0.60	5	0.50	1
4b	0.80	32	0.65	2

Table 3
Point prevalence of proliferative retinopathy and clinically significant macular oedema

	Type 1 diabetes	Type 2 diabetes
Proliferative retinopathy	0.8 %	0.3 %
Clinically significant macular	7.9 %	12.8 %

Table 4
The prevalence of rare retinal lesions.

Rare retinal lesions	Prevalence
White blood vessels	9/984: 0.9 %
Fibrous tissue	12/984: 1.2 %
Venous beading	25/984: 2.5 %
Venous loop	8/984: 0.8 %
Double contoured vessels	7/984: 0.7 %
IRMA	23/984: 2.3 %
Preretinal haemorrhages	1/984: 0.1 %
Vitreous haemorrhages	0/984: 0.0 %

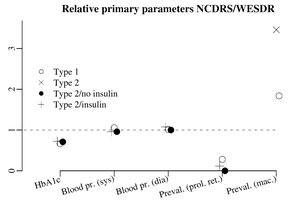

Fig 1
A comparison of previous (WESDR) [2] and present (NCDRS) prevalence rates for HbA1c, blood pressure, proliferative retinopathy and clinically significant macular oedema. Levels above 1 indicate an increased prevalence till today; levels below one indicates decreased prevalence till today.

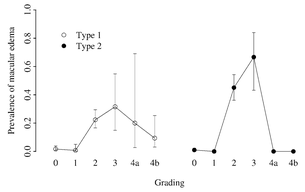

Fig 3
The association between an internationally approved retinopathy scale and the prevalence of clinically significant macular oedema.

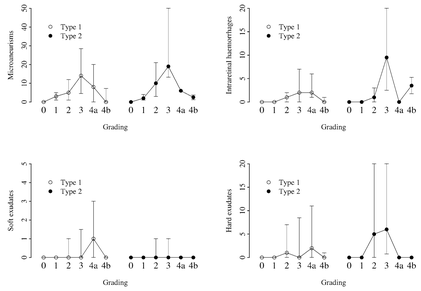

Fig 2
The association between an internationally approved retinopathy scale and the number of frequently occurring retinal lesions (microaneurysms, intraretinal haemorrhages, hard exudates and soft exudates).

Conclusion

1. The prevalence of proliferative retinopathy seems lower than in previous studies.
2. The prevalence of clinically significant macular oedema seems increased compared to previous studies.
3. There is a non-linear association between the retinal grading and the number of retinal lesions.
4. There is a non-linear association between the retinal grading and the prevalence of clinically significant macular oedema.

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