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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 i 4quadrants; definite venous beading in 2 or more quadrants one or more quadrant and no sign of proliferative retinopath |
| 4a | Newly diagnosed neovascularization without signs or history |
| 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

656 Age at entry (years) 37.3 17.6 Duration of diabetes (years) Age at diagnosis (years) 19.0 51.7 % Female participants (%) 172.0 Height (cm) 72.0 ht (kg) BMI (kg/m²) 24.1 8.3 HbA1c (%) Diastolic blood pressure 80.0 130.0 Systolic blood pressure (mmHg) 9.1 Neuropathy (%) 26.2 BP reducing medication (%) Oral antidiabetics (%) 0.0 100 Insulin (%) Lipid lowering medication (%) 6.7

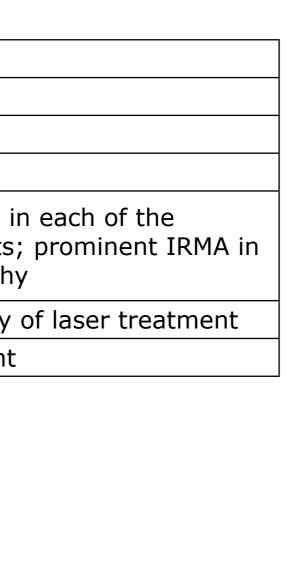


Table 2

Visual acuity at various retinopathy levels

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

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

| Linically Significant macular Deuenna | | | | | |
|---------------------------------------|-----------------|-----------------|--|--|--|
| | 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 % |
| | · |

Populat1on characteristic parameters

Type 1

| T O I ¹ I I |
|--------------------------------------|
| Type 2 diabetes |
| 328 |
| 58.1 |
| 8.0 |
| 48.0 |
| 45.1 % |
| 171.0 |
| 88.0 |
| 29.7 |
| 8.1 |
| 80.0 |
| 140.0 |
| 18.0 |
| 57.6 |
| 36.3 |
| 64.9 |
| 27.1 |
| |

2 diabetes al acuity No 328 201 41

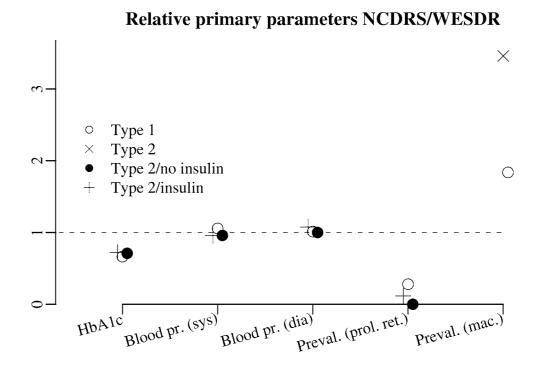
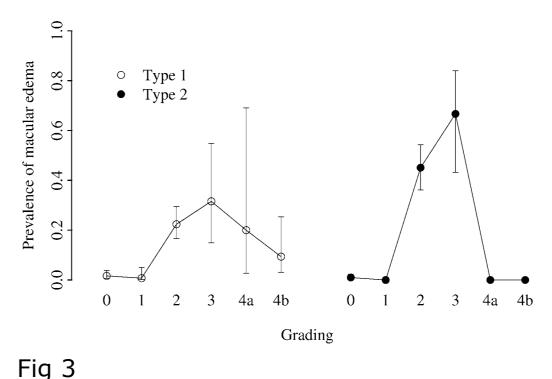


Fig 1

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.



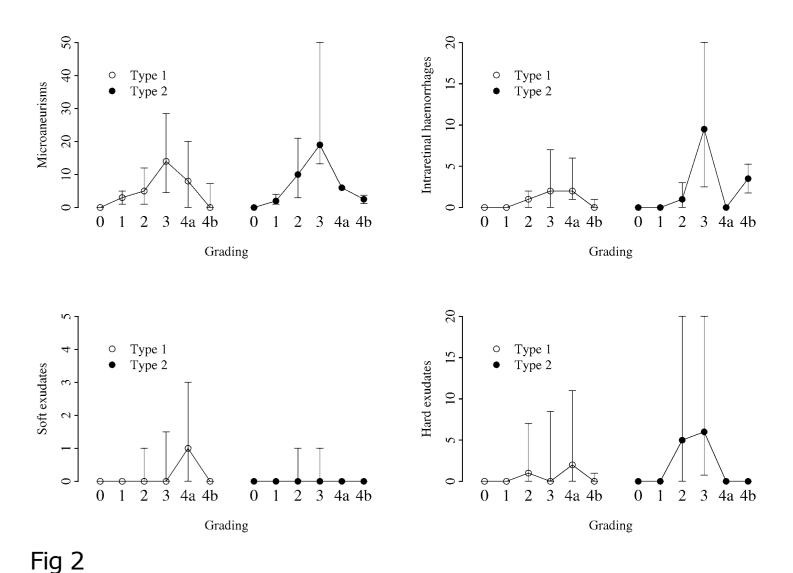
The association between an internationally retinopathy scale and the approved prevalence of clinically significant macular oedema

Conclusion

- in previous studies.
- seems increased compared to previous studies.
- and the number of retinal lesions.

References

Wilkinson CP, Ferris FL, Klein R et al (2003). Proposed international Clinical Diabetic retinopathy and diabetic macular oedema disease severity scale. Ophthalmology 110: 1677-1682. The Wisconsin Epidemiologic Study of Diabetic maculopathy. XI. The incidence of macular oedema. Ophthalmology 1989; 96: 1501-1510.



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

1. The prevalence of proliferative retinopathy seems lower than

2. The prevalence of clinically significant macular oedema 3. There is a non-linear association between the retinal grading 4. There is a non-linear association between the retinal grading

and the prevalence of clinically significant macular oedema.

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