NOCTURNAL BLOOD PRESSURE IS RELATED TO THE PROGRESSION OF RETINOPATHY IN TYPE 1 DIABETIC PATIENTS

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INTRODUCTION

The main objective is to evaluate the relationship between early blood pressure alterations (detected by ambulatory blood pressure monitoring – abpm-) and the development/progression of retinopathy in patients with type 1 diabetes clinically normotesive

METHODS

We designed a prospective observational study of 85 patients, clinically normotensive and without microalbuminuria, monitored over 7 years. Abpm was performed over 24 h and subclinical hypertension was considered if: 1) mean systolic pressure (sbp) was greater than 130 mmHg in the 24 hours and daytime periods and greater than 120 mmHg in the nighttime period and/or mean diastolic pressure (dbp) greater than 80 mmHg or 70 mmHg in the same periods respectively, and/or 2) more than 50% of the readings were higher than the defined previous criteria. Non dipper pattern was defined as nocturnal sbp or dbp <10% relative to the diurnal mean value. We evaluated the development or progression of retinopathy during the following period.

RESULTS

23.5% (n=20) were diagnosed with subclinical hypertension and 36% (n=31) with non dipper pattern as the only pathological finding. 69 patients completed the seven-year follow-up. During this period, 31.8% presented development or progression of retinopathy. Initial mean nocturnal dbp (OR: 1.122, p: 0.034) and final non dipper pattern (or: 5.857, p: 0.005) showed as independent risk factors of progression/development of retinopathy.

Table 1. Characteristics of participants (n=85) at the start of the study

Anthropometric and demographic variables	
Age (years)	27,9 ± 6,1
Duration of DM1 (years)	12,3±6.5
Sex (no. of subjects and %) Female Male	47 (55,3) 38 (44,7)
Body-mass index (Kg/m2)	24,1 ± 3,1
Family history of hypertension (no. of subjects and %)	52 (61,2)
Family history of diabetes (no. of subjects and %)	63 (74,1)
Glycosylated hemoglobin (%)	7,9 ± 1,1

Table 2. Baseline characteristics of subjects analyzed at 7 years of follow-up (n = 69)

Baseline ambulatory blood pressure monitoring parameters		
	Retinopathy progression	
Parameters (mmHg)	Normal or estable (n=47)	Progression (n=22)
24-h systolic blood pressure mean	118.2 ± 8.8	121.1 ± 9.1
Daytime systolic blood pressure mean	121.8 ± 9.2	124.3 ± 9.2
Asleep systolic blood pressure mean	107.7 ± 10.2 *	111.1 ± 10.4 *
24-h diastolic blood pressure mean	72.1 ± 8.2	75.1 ± 10.4
Daytime diastolic blood pressure mean	74.4 ± 5.9	76.3 ± 5.1
Asleep diastolic blood pressure mean	61.3 ± 5.5 *	64.8 ± 7.3*
Non-dipper; n (%)	21 (44.7%)	11 (50%)
		* p<0.005

Table 3. Multiple regression analysis of patients analyzed at 7 years of follow-up using retinopathy progression as dependent variable

Variable	OR	95% CI	p
Initial dbp in repose period	1.122	1.01-1.25	0.034
Initial levels of cholesterol	1.023	1.00-1.05	0.054
Initial waist circumference	1.075	1.01-1.15	0.028
Final non-dipper pattern	5.857	1.68-20.39	0.005

Figure 1. Percentage of progression of retinopathy as a function of diastolic blood pressure in repose period
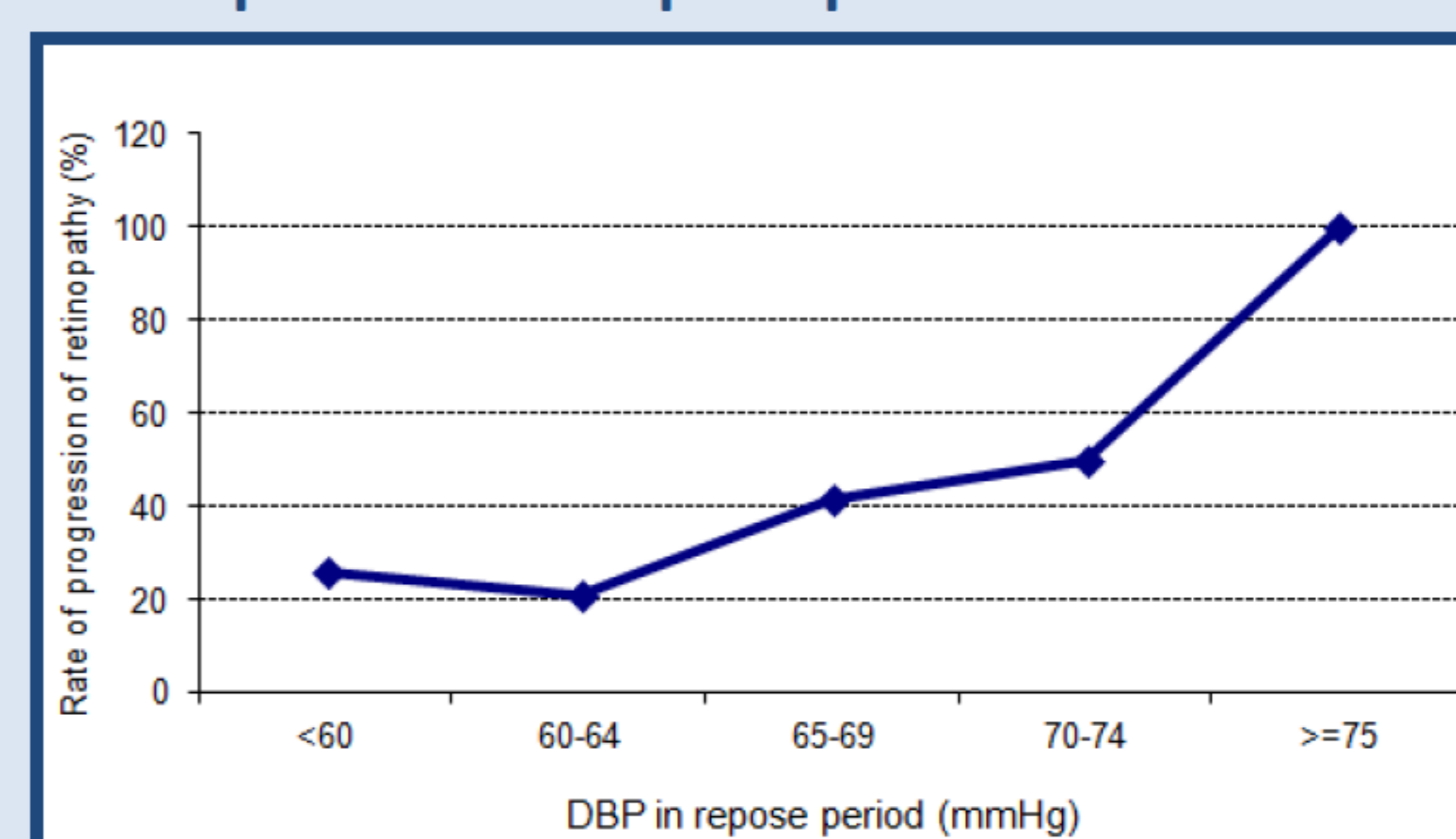
CONCLUSIONS

In type 1 diabetic patients clinically normotensive there is a high prevalence of blood pressure alterations detected by abpm. Nocturnal blood pressure parameters predisposes the development or progression of retinopathy.