NOCTURNAL BLOOD PRESSURE CUT OFF POINTS RELATED TO THE DEVELOPMENT OF MICROVASCULAR COMPLICATIONS AND ARTERIAL HYPERTENSION IN PATIENTS WITH TYPE 1 DIABETES

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INTRODUCTION

In preliminary results of our group, we detected an association between the mean nocturnal blood pressure and development microvascular complications. The objective was to evaluate possible nocturnal blood pressure cut off points in relation to the development or progression of retinopathy, microalbuminuria and arterial hypertension in type 1 diabetic patients

METHODS

We designed a prospective observational study of 85 patients, clinically normotensive and without microalbuminuria, monitored over 7 years. We performed a 24h-ambulatory blood pressure monitoring (abpm) at the beginning and after 7 years. We evaluated the development/progression of retinopathy and development of microalbuminuria and established hypertension over the follow up period. We analyzed different ranges of nocturnal systolic blood pressure (sbp) and diastolic blood pressure (dbp) as independent variables for the development of such complications

RESULTS

69 patients completed seven-year study. After the follow up period, 31.8% presented development/progression of retinopathy, 10.14% developed microalbuminuria and 7.24% of the normotensive patients progressed to established hypertension. Initial nocturnal dbp greater than 65 mmHg showed as a risk factor for the progression of retinopathy and the development of hypertension after 7 years (figures1-2). In spite of the association between the nocturnal sbp and development of microalbuminuria, we did not detect a cut off point from which a significant risk appeared.

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. Multiple regression analysis of patients analyzed at 7 years of follow-up using microvascular complications and development of hypertension as dependent variables

Variable	OR	95% CI	p
Dependent variable: retinopathy progression			
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**
Dependent variable: development of microalbuminuria			
Initial SPB in rest period	1.129	1.03 - 1.23	**0.007**
Dependent variable: development of hypertension			
Initial historical HbA1c	2.767	1.02 - 7.53	**0.046**
Initial BPD in rest period	1.243	1.01 - 1.53	**0.042**
Percentage of 24h SBP ≥130 mmHg	1.075	0.98 – 1.17	0.107

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

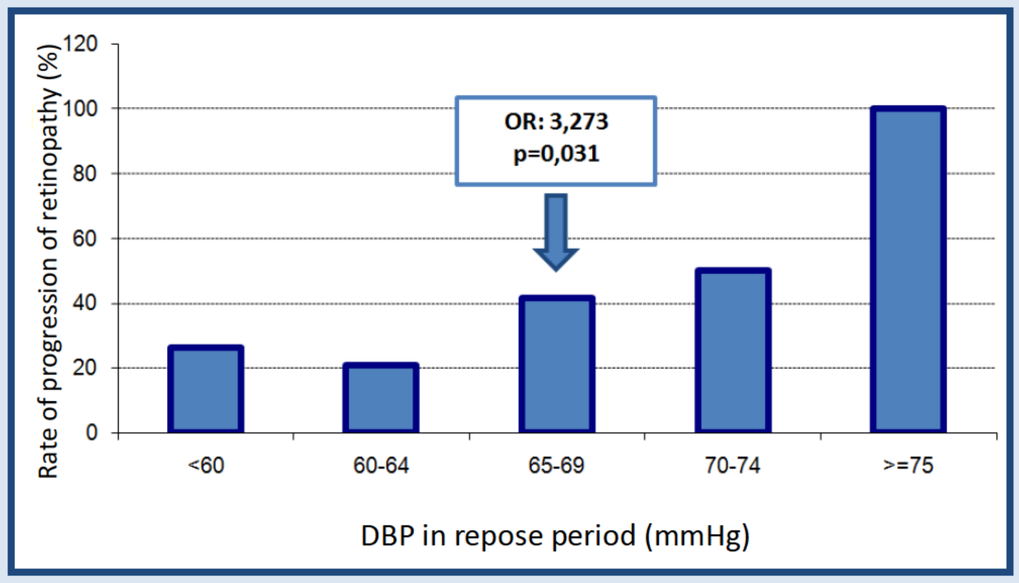
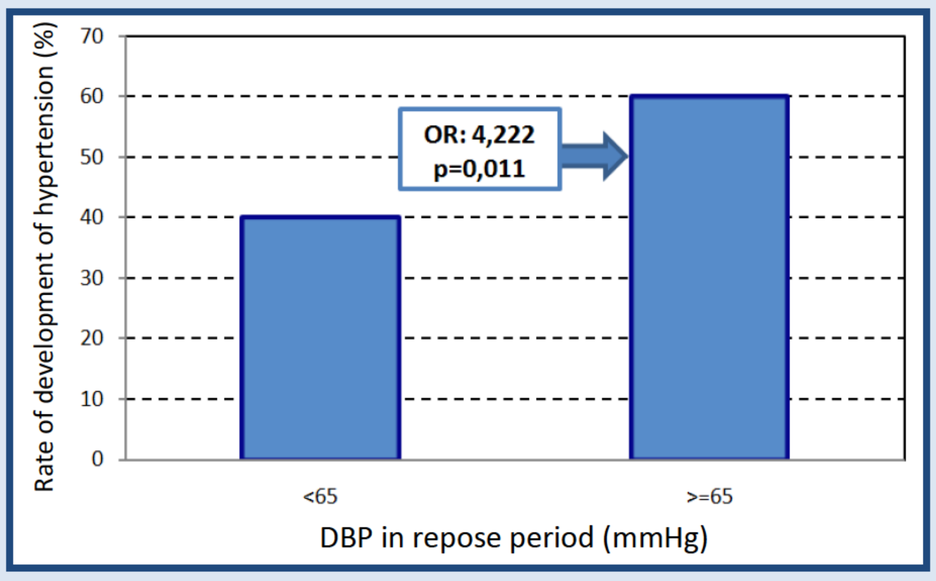


Figure 2. Percentage of development of hypertension as a function of diastolic blood pressure in repose period



CONCLUSIONS

In clinically normotensive and normoalbuminuric patients with type 1 diabetes, a nocturnal dbp greater or equal to 65 mmHg is related to the development/progression of retinopathy and the development of established hypertension.

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