

# **Pulse pressure and ambulatory arterial stiffness index (AASI) in patients with type 1 diabetes**

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## **Keyword:**

Complications - cardiovascular disease

## **ABSTRACT**

### **Aims :**

Arterial pulse pressure (PP) and ambulatory arterial stiffness index (AASI) have been proposed to evaluate the cardiovascular risk in various populations. The aim of the present study was to compare PP and AASI measured classically during a 24-h ambulatory monitoring of blood pressure (AMBP) and during a short 3-min posture test (squatting) in patients with type 1 diabetes mellitus.

**Methods :** systolic (SBP), diastolic (DBP) and pulse pressure (PP = SBP-DBP) were evaluated twice at a few days interval in 59 (20-55 years) type 1 diabetic patients (24 women/35 men, 41±9 years, 20±9 years of diabetes, HbA1c 8.6±1.6 %) with 1) a 24-h AMBP using a Spacelabs 90207® and allowing a separate analysis between nighttime (0-6 AM) and daytime (9AM-9PM); and 2) a continuous noninvasive monitoring (Finapres®) during a 3-min posture test (1 min standing, 1 min squatting, 1 min standing). AASI was calculated as 1 minus the slope of the DBP over the SBP. Twenty-two diabetic patients were treated with a renin-angiotensin inhibitor, mainly because of microalbuminuria.

**Results :** Overall PP was significantly higher during the posture test than during 24h AMBP (58±14 vs 48±9 mmHg; p <0.0001 ). PP was significantly higher in squatting position than during standing (59±17 vs 54±15 mm Hg; p<0.0001). During AMBP, PP was similar during nighttime (46±9 mmHg) and during daytime (46±9 mmHg). A significant correlation was observed between PP measured during the posture test and PP measured during AMBP (r= 0.3078; p=0.0297). AASI during posture test was significantly higher than during 24h AMBP (0.55±0.18 vs 0.36±0.17; p<0.0001). In contrast to what was observed with PP, no significant correlation was observed between AASI calculated during the posture test and AASI calculated during AMBP (r=0.09; NS). A highly significant correlation was observed between PP AMBP and AASI AMBP (r= 0.4794; p=0.0003), but not between PP squatting and AASI squatting (NS). A positive correlation was observed between PP squatting and age (r= 0.4339; p=0.0007) and, although to a lesser extent, between PP AMBP and age (r= 0.3141; p=0.0279). Different results were obtained with AASI for which a nearly significant correlation was observed between AASI AMBP and age (r= 0.2600; p=0.0577), but no correlation at all between AASI squatting and age (r=0.0214; NS). No significant differences in PP and AASI (whatever the test considered) were observed in patients receiving or not receiving a renin-angiotensin blocker.

**Conclusion :** Results of PP and AASI measurements performed during a 24h AMBP recording and a 3min posture test are not superimposable, but gave complementary information, in a population with type 1 diabetes mellitus. Our proof-of-concept study does not support the use of AASI as a cardiovascular risk marker when calculated during a short posture test.