

BOTH LOW AND HIGH SYSTOLIC BLOOD PRESSURE INCREASES THE RISK OF CARDIOVASCULAR EVENTS AND ALL-CAUSE OF MORTALITY IN PATIENTS WITH TYPE 2-DIABETES AND RENAL IMPAIRMENT WITHOUT PREVIOUS CARDIOVASCULAR DISEASE OR CHRONIC HEART FAILURE - THE SWEDISH NATIONAL DIABETES REGISTER (NDR).

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Background

Current guidelines recommend a blood pressure < 140/90 mmHg in patients with diabetes and renal impairment and <130/80 mmHg in the presence of albuminuria.

Aim

To analyse the association between systolic blood pressure level and cardiovascular events (CVE) and all-cause of mortality in patients with type 2 diabetes and renal impairment without previous cardiovascular disease (CVD) or chronic heart failure (CHF).

Patient and methods

33 356 patients with type 2-diabetes and renal impairment (eGFR <60ml/min/1.73m² according to MDRD) from the Swedish National diabetes register (NDR) were categorized into 10 equal-sized groups according to BP level in main study.

BP-values were the mean of all reported values from baseline to the first event or the end of study.

In this sub-study 21 183 patients with type-2 diabetes and renal impairment without previous CVD or CHF (48% men, age 74±9 years, BMI 29.1±4.8 kg/m², diabetes duration 9±8 years, eGFR 49±9 ml/min/1.73m² according to MDRD) were followed for mean 5.3 years (64 months).

Linkages were performed between the NDR and the hospital discharge, cause of death, and prescribed drug registers.

Adjusted time-dependent cox models adjusting for CV risk factors and ongoing medication were used to assess the relationship between BP level and CVEs or all-cause mortality.

Results (see also table 1 below)

During the follow up period 4474 (21%) CVEs and 5155 (24%) deaths occurred. Almost 40% of all patients with a SBP <120 mmHg or >160 mmHg died during the study.

The lowest incidences of CVEs (14%) and all-cause mortality (16%) were observed in the SBP interval 135-139mmHg.

In the adjusted Cox regression model with SBP 135-139 as a reference groups, SBP intervals 80-120 mmHg (HR 2.36, 95% CI 1.91-2.92) and 160-230 mmHg (HR 3.18, 95% CI 2.66-3.82) had highest risk of CVEs. SBP intervals 80-120 mmHg (HR 2.70, 95% CI 2.40-3.27) and SBP interval 160-230 mmHg (HR 2.04, 95% CI 1.72-2.42) the highest risk of all-cause of mortality.

Conclusions

Both low and high systolic blood pressure increases the risk of cardiovascular events and all-cause of mortality also in patients with type 2-diabetes and renal impairment without previous cardiovascular disease or chronic heart failure. This suggests other plausible reasons for this relationship than prior cardiovascular disease or congestive heart failure. For further details see also

Afghahi H et al Blood pressure level and risk of major cardiovascular events and all-cause of mortality in patients with type 2 diabetes and renal impairment: an observational study from the Swedish National Diabetes Register. *Diabetologia*. 2015 Mar 14. [Epub ahead of print].

Table 1. Incidence of stroke, CHD, stroke, CVEs, all-cause mortality, and HRs of CVE and all-cause mortality by deciles of mean SBP in patients without previous CVD or CHF (n=21,183). All patients had renal impairment (eGFR <60ml/min/1.73m² according to MDRD)^a.

SBP Interval (mmHg)	Mean SBP (mmHg)	Stroke number/%	CHD number/%	CVE number/%	CVE ^b HR 95% CI	All-cause mortality number/%	All-cause mortality ^b HR 95% CI
80-120	114±7	88/6.8	180/6.8	291/22.6	2.36 (1.91, 2.93)	461/35.8	2.70 (2.24, 3.27)
120-127	124±2	104/5.4	202/10.1	344/17.2	1.65 (1.35, 2.02)	423/21.2	1.44 (1.19, 1.75)
128-131	130±1	123/6.0	226/11.1	395/19.4	1.66 (1.36, 2.03)	443/21.8	1.45 (1.23, 1.80)
131-135	134±1	109/5.0	210/9.6	360/16.4	1.40 (1.14, 1.71)	393/17.9	1.10 (0.90, 1.34)
135-139 ^c	137±1	119/4.8	172/7.0	342/14.0	1 (ref group)	398/17.9	1 (ref group)
139-142	140±1	148/6.9	273/12.8	480/22.5	1.83 (1.51, 2.22)	558/26.2	1.63 (1.36, 1.95)
142-146	144±1	132/5.8	242/10.7	430/18.8	1.52 (1.25, 1.85)	488/21.4	1.23 (1.07, 1.56)
146-151	149±2	173/7.5	271/11.8	541/23.7	1.86 (1.54, 2.24)	553/24.1	1.30 (1.08, 1.50)
151-160	155±3	170/7.0	281/11.6	527/21.8	1.58 (1.31, 1.91)	595/24.6	1.18 (1.00, 1.42)
160-230	169±10	238/11.3	406/19.0	764/36.5	3.18 (2.66, 3.82)	843/40.2	2.04 (1.72, 2.42)

SBP; systolic blood pressure, blood pressures are means±SD; ^aMean follow up time 5.3 years. ^b(HR) (95% CI) adjusted for age, diabetes duration, gender, HbA1c, BMI, presence/absence of albuminuria, smoking, LDL-cholesterol, triacylglycerol/HDL, previous CVD, previous CHF, antihypertensive and lipid-lowering treatment. ^cSBP 135-139 mmHg was defined as the reference group

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