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## Predictors of uncontrolled blood pressure in hypertensive treated individuals–The CONSTANCES cohort study

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medium and high. We considered heavy alcohol drinking, sedentary level PA, low/medium dietary adherence and overweight/obese (body mass index  $\geq 25$  kg/m<sup>2</sup>) as unhealthy behaviors. Using logistic regression models we estimated the association between control of hypertension and unhealthy behaviors. Statistical analyses were stratified by sex and were performed with SAS 9.4 (SAS Institute). **Results** A total of 8,927 participants were analyzed. The prevalence of uncontrolled HTN was of 53.3% and it was more common in men than in women (66.3% vs. 42.6% respectively,  $P < 0.001$ ). The odds of uncontrolled HTN increased with low dietary adherence in men only ( $P = 0.038$ ), overweight and obese men ( $P < 0.001$ ), heavy alcohol drinking in both men and women ( $P < 0.05$  for both) compared to moderate/light (never) drinking. However, there was no statistically significant association with physical activity in both genders. The frequency of uncontrolled HTN increased with the number of unhealthy behaviors in both sexes ( $P < 0.001$  for men and  $P = 0.008$  for women). Men and women reporting three unhealthy behaviors had 1.53-fold and 1.73-fold increase of the odds of uncontrolled HTN, respectively.

**Conclusion** An unhealthy lifestyle including low/medium adherence to dietary recommendations, high alcohol consumption and overweight/obesity was associated with uncontrolled HTN among treated hypertensive individuals.

**Disclosure of interest** The authors declare that they have no competing interest.

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### Predictors of uncontrolled blood pressure in hypertensive treated individuals—The CONSTANCES cohort study



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**Background** A broad range of factors has been identified to contribute to poor blood pressure (BP) control. But further epidemiologic data in France are needed.

**Purpose** We aimed to assess sociodemographic, clinical and behavioral predictors of uncontrolled BP among treated hypertensive individuals.

**Methods** We conducted cross-sectional analysis using data from the CONSTANCES cohort study. We included 11,159 participants previously diagnosed with hypertension and taking antihypertensive medications. Uncontrolled BP was defined as mean systolic BP  $\geq 140$  mm Hg and/or mean diastolic BP  $\geq 90$  mm Hg. Alcohol use disorder severity was defined according to the French version of the Alcohol Use Disorders Identification Test (AUDIT). Dietary assessment was done based on adherence to French dietary guidelines using the modified National Program on Nutrition and Health (mPNNS). Depressive symptoms were assessed with the Center of Epidemiologic Studies Depression scale (CES-D). Gender specific age-adjusted multivariable analyses were performed using logistic regression models. Adjusted mean systolic BP were studied across selected variables using the General Linear Model.

**Results** The prevalence of uncontrolled BP was 60.2% and it was higher in men than in women (66.5% vs. 52.5%,  $P < 0.0001$ ). A higher proportion of men had both SBP and DBP not at goal (42%) compared to women (34%). We found a significantly lower SBP with

better dietary compliance ( $P = 0.003$  in men), high physical activity ( $P = 0.048$  in women) and low risk of alcohol use disorder ( $P < 0.01$ , both sexes). There was no significant relationship with depression represented by CES-D. In both sexes, predictors of uncontrolled HTN were increasing age, history of CVD and dyslipidemia. In men, additional factors included diabetes (adjusted odds ratio 0.74;  $P = 0.036$ ), increased BMI (ORa 1.26,  $P = 0.01$ ), heavy alcohol drinking (ORa 1.59,  $P < 0.001$ ) and high dietary adherence (ORa 0.69,  $P = 0.05$ )

**Conclusion** In this population-based study, clinical and behavioral characteristics were predictors of uncontrolled HTN. Modifiable risk factors such as weight, diet, alcohol use and physical activity influence the SBP and BP control.

**Disclosure of interest** The authors declare that they have no competing interest.

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### Unhealthy behavior and risk of hypertension—The CONSTANCES population based cohort



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**Background** Unhealthy behaviors may contribute to an increasing prevalence of hypertension (HTN).

**Purpose** We aimed to evaluate the individual and combined association between unhealthy behavior and HTN.

**Methods** We conducted cross-sectional analysis on 48,346 volunteer participants from the CONSTANCES cohort study. Prevalent HTN was defined by a systolic blood pressure (BP)  $\geq 140$  mmHg and/or a diastolic BP  $\geq 90$  mmHg or by individuals receiving antihypertensive medications. Lifestyle behaviors were assessed through validated self-administered questionnaires. Dietary adherence assessment was done using the modified French National Program on Nutrition and Health (mPNNS) score. We considered heavy alcohol drinking, sedentary level PA, low/medium dietary adherence, and overweight/obese as unhealthy behaviors. Using logistic regression, we compared characteristics of subjects according to the number of unhealthy behaviors stratified by sex. After further adjustment, we estimated the association between HTN and unhealthy behaviors.

**Results** The prevalence of HTN was of 31.6% and it was more common in men than in women (39.0% vs. 24.5% respectively,  $P < 0.001$ ). Of those with HTN, 3.3%, 31.7%, 48.8% and 16.2% exhibited 0, 1, 2 or  $\geq 3$  unhealthy behaviors respectively. The prevalence of HTN increased with low/medium dietary adherence compared to high ( $P < 0.01$  for men and women), in overweight/obese compared to normal BMI ( $P < 0.0001$  in both sexes) and with heavy alcohol consumption compared to moderate or never ( $P < 0.001$  for men,  $P = 0.007$  for women). On the other hand, the odds of HTN decreased with moderate/high PA compared to sedentary ( $P < 0.01$  for both genders). Combination of several unhealthy behaviors was associated with increased odds of HTN ( $P$  trend  $< 0.001$ ); men reporting 2 or  $\geq 3$  unhealthy behaviors had an adjusted odds ratio (ORa) of 2.08 and 2.93 respectively, while women had an ORa of 1.98 and 2.46, respectively.

**Conclusion** An unhealthy lifestyle including low/medium adherence to dietary recommendations, high alcohol consumption, low