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ARE OVERACTIVE BLADDER SYMPTOMS RELATED TO THE PRESENCE OF ARTERIAL HYPERTENSION?

Hypothesis / aims of study

Spontaneously hypertensive rats exhibit voiding dysfunction particularly increased micturition frequency and non-voiding detrusor contractions [1], and lower urinary tract symptoms attributed to benign prostatic hyperplasia are more pronounced in men with concomitant arterial hypertension (HT) [2]. Therefore, we have explored the relationship between the presence of hypertension and overactive bladder (OAB) symptoms in a large cohort of OAB patients.

Study design, materials and methods

This study is based upon a pre-planned secondary analysis of the baseline (pre-treatment) data of a previously published large observational study [3]. To allow for a more robust analysis, three operative and overlapping definitions of HT were applied concomitantly. “Measured HT” was defined as a diastolic pressure >90 mmHg. “Diagnosed HT” was defined as the diagnosis of HT being recorded by the physician. “Treated HT” was defined as the presence of any blood pressure-reducing medication on the case record form. Normotensive controls (NT) were defined as subjects to which none of the three HT definitions applied. Descriptive baseline data are shown as means ± SD of n patients. The associations between the variations definitions of HT and OAB symptom episode frequency was explored by logistic regression analysis using age as a covariate, and data are presented as odds ratios with 95% confidence intervals.

Results

Among 4450 study participants, 2194 were classified as NT, 453 had measured HT, 1857 diagnosed HT and 1780 treated HT (of whom 1066 had one, 470 two and 244 more than two antihypertensive medications). Their age and OAB symptom episode frequencies are shown in Table 1.

Table 1: Age and OAB symptom episode frequency

	NT	Measured HT	Diagnosed HT	Treated HT
n	2194	453	1857	1780
Age	58.4±13.2	66.5±10.9	69.2±10.3	69.4±10.3
Micturitions/24 h	13.2±4.8	13.6±4.7	13.4±5.0	13.4±5.0
Nocturia/24 h	3.6±2.0	3.9±1.7	4.0±1.9	4.1±1.9
Urgency 24/h	9.4±6.1	9.5±5.5	9.0±5.9	8.9±5.9
Incontinence/24 h	4.3±3.3	5.0±4.2	4.9±4.0	4.9±4.0

While the three HT groups were markedly older than the NT group, the episode frequency of the OAB symptoms was rather similar in all four groups. Because OAB symptoms are known to increase in age, no statistical analysis was applied to these differences. Rather we have performed logistic regression analysis using the NT subjects as the reference group to explore whether any of the three HT definitions were statistically associated with an increased odds ratio for greater age and/or OAB symptom episode frequency (Table 2). This indicated that subjects with measured HT were more likely to have a greater number of urgency episodes, whereas subjects with diagnosed or treated HT were more likely to have a greater number of nocturia episodes. An inverse analysis, i.e. exploring whether each additional year of age or each additional episode of OAB symptoms was associated with a greater likelihood of having HT showed that age increased the likelihood of having any form of HT; more urgency episodes were associated with a slightly smaller risk odds ratio for diagnosed or treated HT, whereas nocturia episodes were associated a greater odds ratio for diagnosed or treated HT (Table 3).

Table 2: Logistic regression for the likeliness of greater age or OAB symptom episode frequency relative to the NT group. 95% confidence intervals excluding 1 indicate a statistically significant odds ratio.

	Measured HT	Diagnosed HT	Treated HT
Age, years	0.700 (0.555-0.881)	2.066 (1.658-2.573)	2.241 (1.797-2.795)
Micturitions/24 h	1.191 (0.945-1.502)	0.936 (0.751-1.167)	1.122 (0.899-1.400)
Urgency/24 h	1.343 (1.064-1.695)	0.927 (0.741-1.159)	0.871 (0.695-1.090)
Nocturia/24 h	0.932 (0.737-1.179)	1.259 (1.006-1.574)	1.444 (1.153-1.808)
Incontinence/24 h	1.049 (0.827-1.332)	1.202 (0.949-1.522)	1.119 (0.883-1.418)

Table 3: Logistic regression for the likeliness of having HT per year of greater age or episode of OAB symptom relative to the NT group. 95% confidence intervals excluding 1 indicate a statistically significant odds ratio.

	Measured HT	Diagnosed HT	Treated HT
Age, years	1.020 (1.011-1.028)	1.065 (1.058-1.072)	1.067 (1.060-1.074)
Micturitions/24 h	1.018 (0.990-1.048)	1.010 (0.990-1.031)	1.007 (0.986-1.027)
Urgency/24 h	1.002 (0.980-1.024)	0.977 (0.962-0.993)	0.972 (0.957-0.988)
Nocturia/24 h	0.964 (0.902-1.031)	1.069 (1.021-1.119)	1.092 (1.043-1.144)
Incontinence/24 h	1.010 (0.979-1.043)	1.009 (0.986-1.033)	1.015 (0.992-1.039)

Interpretation of results

While some associations between HT definitions and OAB symptom episode frequency yielded statistical significance, the resulting odds ratios typically were close to unity, indicating that the associations were weak at best. Moreover, some of the detected associations may be secondary to existing antihypertensive treatment, e.g. with diuretics, rather than reflecting primary associations between HT and OAB.

Concluding message

We conclude that associations between HT and OAB episode frequency are weak at best. This contrasts findings in rats [1] or men with voiding dysfunction attributed to benign prostatic hyperplasia [2]. While an enhanced activity of the sympathetic nervous system is a typical feature of spontaneously hypertensive rats and HT patients and may also contribute to the pathophysiology of voiding dysfunction attributed to benign prostatic hyperplasia, it may not be a major factor in OAB.

References

1. Steers et al. (1999) The spontaneously hypertensive rat: insight into the pathogenesis of irritative symptoms in benign prostatic hyperplasia and young anxious males. Exp. Physiol. 84: 137-147
2. Michel et al. (2004) Association of hypertension with symptoms of benign prostatic hyperplasia. J. Urol. 172: 1390-1393
3. Michel et al. (2008) Cardiovascular safety and overall tolerability of solifenacin in routine clinical use. Drug Safety 31: 505-514

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Is this a clinical trial?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**No**
This study did not require eithics committee approval because	**ethical committee approval was neither required or recommended for observational studies in Germany at the time the underlying study was performed. Then present abstract only analyzes baseline data, i.e. no intervention has been performed.**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**No**