Lifestyle interventions in the management of hypertension: a survey based on the opinion of 105 practitioners

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Background. Lifestyle interventions in the management of hypertension were beneficial in published studies.

Objective. To evaluate (1) which lifestyle recommendations are given by physicians and to what extent the possibility of drug-induced hypertension is addressed; (2) to study the characteristics of the physicians who more often perform lifestyle interventions.

Methods. General practitioners in the area of Dordrecht were asked whether or not they included lifestyle advice in the management of their patients' hypertension.

Results. Of the 176 physicians invited, 105 consented to take part. Measures to reduce body weight, stopping smoking, and physical exercise advice were given by 94, 92, and 92% of the physicians, respectively. Advice on psychological relaxation and reducing liquorice (Dutch: drop) intake was only given by 23 and 32%. Rural physicians were more active: they more often recommended quitting smoking ($p<0.02$), reducing weight ($p<0.02$), and participating in sporting activities ($p<0.02$). And so were older physicians: they more often recommended starting low-calorie diets ($p<0.05$), stopping liquorice consumption ($p<0.04$) and emphasised drug compliance ($p<0.02$). Increased blood pressure as a side effect of concomitant medications, other than nonsteroidal anti-inflam-

matory drugs and oral contraceptives, was virtually never addressed.

Conclusions. (1) Advice to reduce body weight, stop smoking, and increase physical exercise are the only lifestyle recommendations routinely given, (2) rural physicians and older physicians were more active in giving non-drug treatments, (3) increased blood pressure as a side effect of medications was virtually never addressed. (*Neth Heart J* 2009;17:9-12.)

Keywords: non-drug treatment, hypertension, lifestyle factors, antihypertensive drugs

Several studies have demonstrated a benefit of lifestyle recommendations in the management of hypertension,¹⁻⁹ although controlled trials are rare. In one long-term (four-year) controlled study – the Treatment of Mild Hypertension Study (TOMHS)¹⁰ – lifestyle interventions, including weight loss, sodium restriction, moderated alcohol intake, and behaviour modification produced a reduction in blood pressure of 9/9/mmHg. After the addition of various medications, an additional reduction of 5/3 mmHg was obtained. There was a significant reduction in cardiovascular events in the medication plus lifestyle group compared with the lifestyle group only.

The Dietary Approaches to Stop Hypertension (DASH)¹¹ study demonstrated that a diet rich in fruits, vegetables, and low-fat dairy products, with reduced saturated and total fat, can substantially reduce blood pressure. The Trial of Nonpharmacologic Interventions in the Elderly (TONE) study¹² demonstrated that appropriate advice about diet, exercise and weight loss was significantly more likely to prevent either restarting antihypertensive drug therapy or cardiovascular events than general health education alone. Most publications, however, are uncontrolled or case reports, such as two recent liquorice studies from the Netherlands.^{13,14} In spite of limited research data, current consensus reports address the issue.^{15,16} The ESC hypertension guidelines advise (1) smoking cessation, (2) weight reduction and stabilisation, (3) reduction of excessive alcohol intake, (4) physical

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exercise, (5) reduction of salt intake, (6) increase in fruit and vegetable intake and decrease in saturated and total fat intake.

Hypertension is a registered possible adverse effect of various drug classes including the NSAIDS (non-steroidal anti-inflammatory drugs), oral contraceptives, sympathicomimetics, antimigraine drugs, antidementia drugs, corticosteroids, antidepressants, antineuropathic drugs, antiepileptic drugs, and anti-Parkinson drugs.^{17,18}

This paper tries to answer two questions. First, we will evaluate what lifestyle recommendations are routinely given by physicians in general practice, and to what extent the possibility of drug-induced hypertension was considered by them to be a real possibility. Second, we will study the characteristics of the physicians who more often perform lifestyle interventions.

Methods

We assumed that the region of Dordrecht and Alblasserwaard, situated in the centre of the Netherlands with 350,000 inhabitants, approximately 50% of them living in rural areas and 50% of them in cities,

Table 1. A condensed summary of the self-administered questionnaire applied in this study.

Do you routinely recommend that the patient:

- Quits smoking
- Reduces alcoholic beverages
- Reduces salt intake
- Reduces liquorice intake
- Stops eating an unhealthy diet
- Loses weight
- Increases physical activities
- Improves drug compliance
- Adopts a healthier lifestyle in general

Do you routinely discuss a possible role for psychological tension with your patient

Do you recommend self-measured blood pressure

Do you routinely discuss the following as possible contributory factor to hypertension:

- Corticosteroids
- Antidepressants
- Antimigraine drugs
- Antiepileptic drugs
- Anti-Parkinson drugs
- Contraceptives
- Antidementia drugs
- Antineuropathic drugs
- Nonsteroidal anti-inflammatory drugs
- Sympathomimetics

would pretty much represent the entire Dutch population. All general practitioners in this region were invited to participate in this study. The study took place in the months August 2007 to February 2008. Self-administered questionnaires consisted of questions about physicians' personal characteristics (five questions), questions about lifestyle recommendations, specifically asking about non-pharmaceutical treatments (12 questions), questions addressing whether or not the physicians routinely gave specific lifestyle advice, including taking into account the possibility that blood pressure increasing factors including medicines known to increase blood pressure were involved (ten questions), and healthy lifestyle questions (three questions). The questions were partly based on the items applied in previous studies.^{1,8,9} Binary questions were generally applied. A condensed summary of the questionnaire is shown in table 1. Prior to the study, the questionnaire was approved by four physicians, one experienced general practitioner and three internists and hypertension specialists.

Statistical analysis

The summary statistics were given with 95% confidence intervals. Also multiple logistic regression analyses were performed with the various non-drug treatments as outcome variables and the physicians' characteristics as predictors. The goodness of fit of the multiple logistic models were assessed using Nagelkerke R squares. Multicollinearity was assessed using Pearson correlation coefficients. Two-sided p values <0.05 were defined as statistically significant. A p value between 0.05 and 0.10 was defined as a trend to significance. As this is exploratory research, no formal corrections for multiple testing were performed.

Results

Of the 176 physicians included, 105 adequately completed the self-administered questionnaire (60%, 95% confidence interval 52 to 67%). Body weight reducing measures, stopping smoking, and physical exercise advice were most often given (table 2). Advice on psychological relaxation and reduction of the intake of liquorice was given by less than ≤32% of the doctors (table 2). Of the physicians, 77% and 37%, respectively, routinely considered that NSAIDS (nonsteroidal anti-inflammatory drugs) and oral contraceptives may be responsible for their patients' hypertension. However, the other eight categories of drugs, which are classified as drugs with hypertension as a possible side effect, were rarely or not taken into account (0 to 15%, table 3).

Table 4 shows the results of the logistic regression analyses with the various non-drug treatments as outcome variables and the physicians' characteristics as predictors. Rural physicians were more active in advising non-drug treatment than were their city counterparts: they recommended or tended to recommend better (1) quitting smoking (p<0.02), watching

Table 2. Number of physicians who routinely discussed various non-drug treatments and advice with their patients (n=105).

Items	Physicians n (%)	95% CI
Overweight	99 (94)	88-98
Nicotine	97 (92)	85-97
Sporting activities	97 (92)	85-97
Liquorice	87 (83)	75-90
Alcoholic beverages	87 (83)	75-90
Dietician	86 (82)	73-89
Salt intake	77 (73)	65-82
Healthy diet	65 (62)	54-73
Self-measured blood pressure	55 (52)	44-64
Liquorice tea	34 (32)	22-40
Psychological tension	24 (23)	19-36

CI=confidence interval.

Table 3. Numbers of physicians who routinely considered the possibility of hypertension as a side effect of drugs (n=105).

Drug	Physicians n (%)	95% CI
NSAIDS	82 (78)	68-85
Contraceptives	39 (37)	28-47
Sympathomimetics	16 (15)	9-24
Antimigraine drugs	15 (14)	8-23
Antidementia drugs	14 (13)	7-21
Corticosteroids	7 (7)	3-14
Antidepressants	6 (6)	3-13
Antineuropathic drugs	4 (4)	1-9
Antiepileptic drugs	1 (1)	0-5
Anti-Parkinson drugs	0 (0)	0-3

NSAID=nonsteroidal-anti-inflammatory drug, CI=confidence interval.

weight ($p<0.02$), participating in sporting activities ($p<0.02$), and increasing physical activity ($p<0.06$). Older physicians were also more active compared with their younger counterparts: they were better in advising low-calorie diets ($p<0.05$), emphasising drug compliance ($p<0.02$), and stopping liquorice intake (Dutch:

drop) ($p<0.04$). However, the older physicians tended to less often recommend participation in sporting activities ($p<0.07$). Female physicians also tended to less often recommend sporting activities ($p<0.10$), but more often advised a change in contraceptive method ($p<0.09$) than did their male counterparts.

Table 4. Physicians' characteristics that were statistically significant predictors for specific non-drug treatments given.

Physicians characteristics and non-drug treatment advice	B value	SE	P value	Odds ratio
More often addressed by rural physicians				
- Physical exercise	0.40	0.21	<0.06	1.49
- Nicotine	0.60	0.26	<0.02	1.82
- Sodium intake	0.31	0.19	<0.10	1.36
- Liquorice tea	0.32	0.18	<0.09	1.38
- Body weight	0.93	0.38	<0.02	2.53
- Sport	0.62	0.27	<0.02	1.66
Less often addressed by physicians new in practice				
- Drug compliance	-1.56	0.64	<0.02	0.21
- Liquorice	-1.24	0.61	<0.04	0.29
- Sport	-1.54	0.85	<0.07	0.21
Less often addressed by younger physicians				
- Liquorice	-1.33	0.78	<0.09	0.26
- Low-calorie diet	-1.10	0.55	<0.05	0.33
- Antidepressants	-2.06	1.27	<0.10	0.13
More often addressed by male physicians				
- Sport	2.18	1.34	<0.10	8.85
Less often addressed by male physicians				
- Contraceptives	-0.99	0.57	<0.09	0.37

All predictors were adjusted for gender, age, years of practice, type of practice (rural or city and solo or group practice). The Nagelkerke R square values varied from 0.10 to 0.35, the Pearson correlation coefficients varied from -0.66 to + 0.67.

Discussion

Advice on smoking cessation, and weight reduction and increase in exercise was given by 92 to 94% of the physicians, respectively. However, recommendations regarding healthy diet, relaxation methods for reducing psychological tension, and self-measured blood pressures are not routinely given, leaving room for improvement.

NSAIDs and oral contraceptives were regularly considered as possibly being responsible for hypertension. However, other common classes of hypertension-enhancing drugs such as sympathicomimetics, antidepressants, antimigraine drugs, and corticosteroids were rarely addressed by the physicians. Anti-Parkinson drugs were not considered as a cause at all.

Rural physicians and older physicians were more active in giving non-drug treatments than were their counterparts. This has not been previously shown in physicians treating hypertension, but is consistent with other studies showing a preference of older physicians and rural family practitioners for preventive and non-drug treatment recommendations.^{19,20} Female physicians displayed patterns of non-drug treatments and types of advice fairly similar to those of their male counterparts.

A limitation of our study was that it was retrospective and may, therefore, suffer from some recall bias. Another limitation was the large proportion of physicians who were invited but preferred not to participate (41%). This may have introduced some selection bias in the data.

A survey similar to ours performed by the Netherlands Institute for Health Services Research (NIVEL) (table 5)²¹ has recently been completed in this country. The overall percentage of physicians giving non-drug treatments was somewhat smaller in this study than it was in ours. The difference between the two studies may be related to a relatively high recruitment of rural physicians in our study, but selection bias is also a possibility.

Conclusions

1. Non-drug treatments are far from routinely applied by general practitioners.
2. Rural physicians and older physicians were more active in giving non-drug treatments.
3. Increased blood pressure as a side effect of concomitant medications, other than NSAIDs and oral contraceptives, was virtually never addressed by any category of physicians. ■

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Table 5. Current survey compared with the 2007 NIVEL survey.²¹

	Current study	NIVEL
GPs asked to participate	176	600
Responders (number, %)	104 (59)	180 (30)
Advised quitting smoking (%)	92	76
Advised reducing alcohol (%)	83	26
Advised healthy diet (%)	62	44
Advised physical activities (%)	92	61

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