Risk Factor Profile and Achievement of Treatment Goals among Hypertensive Patients in General Practice In Israel: Baseline Results From The Israeli Blood Pressure Control (IBPC) Program

Eyal Leibovitz MD[1], Dov Gavish MD[1], Dror Dicker MD[3], Reuven J. Viskoper MD[2] and Chaim Yosefi MD[2] for the IBPC program

[1]Department of Internal Medicine A, Wolfson Medical Center, Holon, Israel
Affiliated to Sackler Faculty of Medicine, Tel Aviv University, Ramat Aviv, Israel
[2]Department of Internal Medicine B, Barzilai Medical Center, Ashkelon, Israel
[3]Department of Internal Medicine C, Hasharon Medical Center, Petah Tiqva, Israel

Key words: blood pressure control, target organ damage, antihypertensive treatment, family physician

Abstract:

Background: The Israeli Blood Pressure Control program was initiated to enhance the control of modifiable risk factors among high risk hypertensive patients followed by general practitioners in Israel.

Objective: To report the baseline results of the state of the treatment regarding blood pressure management, lipid and glucose control as well as obesity and smoking cessation among the patients.

Methods: Hypertensive patients were screened in 30 general practice clinics supervised by family medicine specialists seeing 1,000–5,000 patients each. Between 50 and 250 hypertensive patients were diagnosed at each participating clinic. Blood pressure levels, body mass index, lipid and glucose levels, as well as target organ damage and medications were recorded for all patients.

Results: Of the 4,948 patients registered, 2,079 were males (42%). Mean age was 64.8 $\pm$ 12. Blood pressure control was achieved in only 33.1% of total hypertensive patients. Low density lipoprotein control was achieved in 31.1% of all patients, and glucose control in only 28.5%% of diabetic patients (glucose < 126 mg/dl); 20.7% of the diabetics had glucose levels above 200 mg/dl. In this group of patients 38.9% were obese (BMI >30 kg/m^2). While there were more obese females than males (48.0% vs. 35.6%), no difference was found in blood pressure, lipid or glucose control between the genders.

Conclusion: Risk factor management of hypertensive patients attending general practice clinics in Israel is not optimal, especially among those with diabetes or in need of secondary prevention measures. A long-term intervention program for high risk patients in the community is needed to improve the current situation.

IMAJ 2003;5:697–701

Atherosclerosis is the leading cause of death in the western world [1]. Many studies have proven that treating risk factors for the disease (such as hypertension, hyperlipidemia and diabetes) reduces morbidity and mortality. Based on these results, many medical societies have published their treatment recommendations [2–5] to help achieve optimal risk reduction. Despite the accumulated knowledge on this disease and the clear treatment recommendations, the incidence of atherosclerosis is still very high.

One of the main reasons is that the guidelines, both the American [7–10] and the European [11,12], are not fully implemented. The HERS study (Heart and Estrogen/Progestin Replacement) showed that 91% of the volunteers enrolled in the study did not reach the low density lipoprotein target levels [7]. Researchers in the EUROASPIRE study (European Action on Secondary Prevention by Intervention to Reduce Events) showed a low rate of blood pressure and lipid control (along with obesity and other modifiable risk factors) in 1991 and 1997 [11,12].

Many centers tried to improve the quality of treatment by increasing the number of follow-up visits and blood testing, as well as by adjusting the treatment to suit each individual patient. These attempts succeeded in improving the risk factor control rate, but since most projects called for directing patient follow-up to specialized risk factor clinics [13,14] the guidelines were not implemented fully.

We designed a program to help improve the quality of care for patients at risk for cardiovascular events while using the patients' own family practitioners as the follow-up physicians. We report the baseline results of blood pressure control as well as the control rate of additional risk factors.

Patients and Methods

The Israeli Blood Pressure Control program was initiated in 2000. In this survey we included patients from 30 general practice clinics across Israel, which are directed by specialists in family medicine who see between 1,000 and 5,000 patients each. The participating physicians were interested in hypertension control, and all showed readiness to join a program that aimed at improving the quality of care in general practics. The program mandated active participation, and each physician was allocated a small budget for program-related expenses. All physicians were asked to screen between 50 and 250 hypertensive patients and to fill out forms with the relevant data (the number of patients screened affected each budget).

For each patient we recorded the following: age, gender, blood pressure levels, presence of diabetes and hyperlipidemia, body mass index, lipid levels (high density lipoprotein cholesterol, LDL cholesterol, and triglycerides), glucose levels, target organ damage, and medications. There were no names on the forms, and each participating center was given a number. The study was approved by the Institutional Review Board.

The local laboratories performed blood work for each respective clinic. Blood pressure measurements were recorded by the

BMI = body mass index

physicians as a mean of two consecutive measurements 5 minutes apart while the patient was resting for 10 minutes before the first measurement. BP measurements were done using the sphingomanometer that was available in each clinic. BMI was calculated by the family practitioners, but they were asked to record the patients' weight and height as well. Weight and height were measured (without shoes) by the physicians, using the clinic's weight and height scales. Smoking status was also recorded, with patients being categorized as smokers (current smokers) or non-smokers (including past smokers and non-smokers). For the smokers, the physicians were asked to record the number of cigarettes smoked per day.

TOD was defined as one or more of the following: ischemic heart disease, cerebrovascular disease (either stroke or transient ischemic attack), peripheral vascular disease, any degree of retinopathy, proteinuria above 300 mg/day, creatinine level above 1.5 mg/dl, and left ventricular hypertrophy (diagnosed by electrocardiography or echocardiography). Physicians were asked to record every TOD but did not have to specify severity (i.e., number of strokes, creatinine level, proteinuria level, or degree of retinopathy).

Treatment profile was recorded for blood pressure. Each drug category was given a letter ("A" for angiotensin-converting enzyme inhibitors, "B" for beta-blockers, etc.) and the physicians were asked to record the letters of the drugs that each patient received. Patients taking three or more medications from three different drug groups at the maximal recommended doses were marked as "maximal therapy." The names and doses of drugs were not recorded. Treatment with lipid-lowering medications was recorded, but not the type or dose of the drug (i.e., statins, fibrates or resins). Antidiabetic medications and other drugs were not recorded.

We defined blood pressure control according to the ISH guidelines (International Society of Hypertension) [1], which are similar to the JNC-VI guidelines (Joint National Committee) (i.e., below 140/90 in all cases except for diabetics and/or patients with nephropathy). LDL control was defined according to the Israel Medical Association guidelines for lipid control, which are similar to the NCEP-ATP III guidelines (National Cholesterol Education Program-Adult Treatment Panel) (i.e., LDL target below 100 mg/dl for patients with diabetes, ischemic heart disease, cardiovascular disease or peripheral vascular disease, and below 130 or 160 mg/dl according to the number of risk factors) [2]. A "controlled hypertensive patient" was defined as a patient with BP levels below or equal to the target blood pressure levels according to the guidelines. A "controlled hyperlipidemic patient" was defined as a patient with LDL levels below the recommended LDL levels; a "controlled patient" as a patient with both blood pressure and LDL cholesterol levels controlled; and a "diabetic controlled patient" as a diabetic patient who is a "controlled patient" with fasting serum glucose levels below 126 mg/dl. We also defined parameters for clinics: a "successful hypertension clinic" was defined as a clinic that has more than 35% "controlled hypertensive patients," and a "successful hyperlipidemia clinic" as a clinic with more than 35% "controlled hyperlipidemia patients."

Data analysis was done using the SPSS statistical software. We used chi-square analysis to determine the frequency of treatment goal achievement. To compare numerical data from the different patient groups we used the ANOVA procedure, and for the post-hoc analysis we used the Bonferroni procedure.

Results

The data of 4,948 patients from 30 different general practices were registered. Patients' demographics and risk factor prevalence are shown in Table 1. Mean blood pressure was 141.2/84.3. BP levels did not vary between males and females. Systolic blood pressure was 141.2 mmHg for males and 141.3 for females. Diastolic blood pressure was 84.6 mmHg for males and 84.0 for females. Systolic blood pressure was not correlated with age ($r = 0.09$, $P = 0.53$) but diastolic blood pressure had a negative correlation with age ($r = -0.22$, $P < 0.001$). Both systolic and diastolic BP were correlated to BMI ($r = 0.06$, $P < 0.001$ for both cases).

We found no differences in systolic and diastolic BP levels between patients with and without target organ damage. However, analysis of the subgroups of patients according to the different target organ damage showed that systolic blood pressure levels were higher in patients with peripheral vascular disease, significant proteinuria, and diabetes; whereas diastolic blood pressure levels were elevated in patients with a history of stroke, hypertensive retinopathy or proteinuria. The influence of different parameters on the blood pressure levels is specified in Table 2.

Table 1. Demographic parameters, risk factor status and the extent of organ damage

Parameter	Value (n=4,948)
Demographics	
Age (mean ± SD)	64.6 ± 12.3
Males (%)	2,079 (42%)
Target organ damage	
Cerebrovascular disease (%)	301 (6.1%)
Coronary heart disease (%)	705 (14.2%)
Peripheral vascular disease (%)	247 (5.0%)
Left ventricular hypertrophy (%)	573 (11.6%)
Proteinuria > 1g/d (%)	278 (5.6%)
Creatinine > 1.5 mg/dl (%)	101 (2.0%)
Retinopathy (%)	267 (5.4%)
Additional risk factors	
Diabetes	1,127 (22.8%)
Obesity	1,925 (38.9%)
BMI	29.0 ± 4.8 (kg/m^2)
Blood pressure	
Systolic BP (mean ± SD)	141.2 ± 16.5 mmHg
Diastolic BP (mean ± SD)	84.3 ± 10.4 mmHg
Maximal treatment (%)	653 (13.2%)
Laboratory results	
Glucose (mean ± SD)	114.3 ± 42.4 mg/dl
Triglycerides (mean ± SD)	172.5 ± 90.2 mg/dl
LDL cholesterol (mean ± SD)	133.9 ± 41.9 mg/dl
HDL cholesterol (mean ± SD)	46.2 ± 12.4 mg/dl

BP = blood pressure
TOD = target organ damage

Table 2. Parameters influencing blood pressure levels

	Presence of parameter		*P* value*
Parameter	**Yes**	**No.**	
Total target organ damage			
Systolic BP	141.6	141.0	0.33
Diastolic BP	**84.4**	**84.1**	**<0.001**
Hx of stoke or transient ischemic attack			
Systolic BP	142.8	141.1	0.12
Diastolic BP	**84.5**	**84.2**	**0.03**
Peripheral vascular disease			
Systolic BP	**144.7**	**141.0**	**0.01**
Diastolic BP	84.3	84.2	0.16
Hypertensive retinopathy			
Systolic BP	141.0	141.2	0.82
Diastolic BP	**84.2**	**85.3**	**0.06**
Elevated creatinine			
Systolic BP	141.6	141.2	0.74
Diastolic BP	83.4	84.3	0.64
Left ventricular hypertrophy			
Systolic BP	139.5	141.5	0.007
Diastolic BP	83.6	84.3	0.66
Ischemic heart disease			
Systolic BP	139.7	141.5	0.006
Diastolic BP	83.6	84.3	0.42
Significant proteinuria			
Systolic BP	**145.9**	**140.9**	**<0.001**
Diastolic BP	**88.3**	**84.0**	**<0.001**
Diabetes mellitus			
Systolic BP	**142.3**	**140.9**	**0.02**
Diastolic BP	83.6	84.4	0.15

* *P* value is adjusted for age and gender

Only 33.1% were considered "hypertension controlled patients," and 14 of the participating clinics (47%) as successful hypertension clinics. Blood pressure control was similar between males and females. BP control was achieved in 976 women (34.1%) and 660 males (31.7%) ($P = 0.19$). We performed logistic regression to identify the parameters that affected blood pressure achievement. We found that female gender (odds ratio 1.34, 95% confidence interval 1.13–1.60) and LDL-lowering medications (OR 1.36, 95%CI 1.13–1.64 respectively) were associated with a higher achievement of BP target goals, $P < 0.001$ for both parameters. The presence of diabetes (OR 0.21, 95%CI 0.16—0.28) and elevated LDL levels (OR 0.995, 95%CI 0.993–0.998) were associated with a lower rate of BP target goal achievement ($P < 0.001$ for both parameters). BMI levels, triglyceride levels and the fact that patients received "maximal therapy" did not affect the rate. Target organ damage did not influence the rate of BP goal achievement, but analysis of the different target organ damage showed that stroke (OR 1.61, 95%CI 1.10–2.38), proteinuria (OR 13.2, 95%CI 5.3–32.6), nephropathy (OR 3.07, 95%CI 1.16–8.09), ischemic heart disease (OR 0.54, 95%CI 0.38–0.81) and retinopathy (OR 0.54, 95%CI 0.39–0.74) affected the rate of BP goal achievement. Left ventricular hypertrophy and peripheral vascular disease did not affect the BP goal achievement rate.

Target organ damage occurred in 36.2% of the patients, and 38.9% patients were obese. TOD was more prevalent among males than females (42% vs. 32%, $P < 0.001$). The most common TOD among males and females was ischemic heart disease (14.2%). Also, 17.5% of the males suffered from ischemic heart disease (as compared to 11.8% of females, $P < 0.001$). Other TOD that were more prevalent in males included left ventricular hypertrophy (13.6% in males vs. 10.1 in females, $P < 0.001$), significant proteinuria (7.4 vs. 4.4%, $P < 0.001$), peripheral vascular disease (6.0 vs. 4.2%, $P < 0.001$), and elevated creatinine (2.8 vs. 1.5%, $P = 0.001$). Cerebrovascular disease and retinopathy were similar among both genders (6.8 and 4.5% respectively in males vs. 5.6 and 6.0% respectively in females, $P = 0.16$ and $P = 0.06$ respectively). Gender did not influence the prevalence of diabetes (23.2 in males vs. 22.5% in females, $P = 0.64$), but more females were obese (48.0 vs. 35.6% of males, $P < 0.001$).

Only 31.1% of the registered hypertensive patients had LDL cholesterol levels below the recommended target levels, and only 10 clinics (33%) were successful (more than 35% of their registered hypertensive patients reaching the recommended LDL cholesterol levels). No difference was noted between the genders. LDL levels were below the guideline level in 887 females (31.0%) and 681 males (32.8%) ($P = 0.22$). Only 44.6% of the patients with elevated LDL cholesterol received lipid-lowering medications.

Only 11.1% of the patients were controlled (with both LDL cholesterol and blood pressure below the recommended treatment goals) [Figure 1]. Forty-six percent of the patients had neither LDL cholesterol nor blood pressure levels below the recommended goals. The most significant factors associated with uncontrolled patients were diabetes (OR 0.15, CI 0.099–0.25, $P < 0.001$) and the presence of TOD (OR 2.45, CI 1.81–3.32, $P < 0.001$). Other factors included age (OR 0.98, CI 0.97–0.99, $P < 0.001$) and LDL cholesterol levels (OR 0.93, CI 0.92–0.94, $P < 0.001$). Triglyceride and HDL cholesterol levels, gender, glucose and BMI did not influence this rate.

Glucose levels were far from optimal in the hypertensive patients with diabetes. Fasting glucose levels were above 126 mg/dl in 71.5% of the diabetic patients, and 20.7% of the diabetics had glucose levels above 200 mg/dl. There was no difference in hyperglycemia

OR = odds ratio
CI = confidence interval

HDL = high density lipoprotein

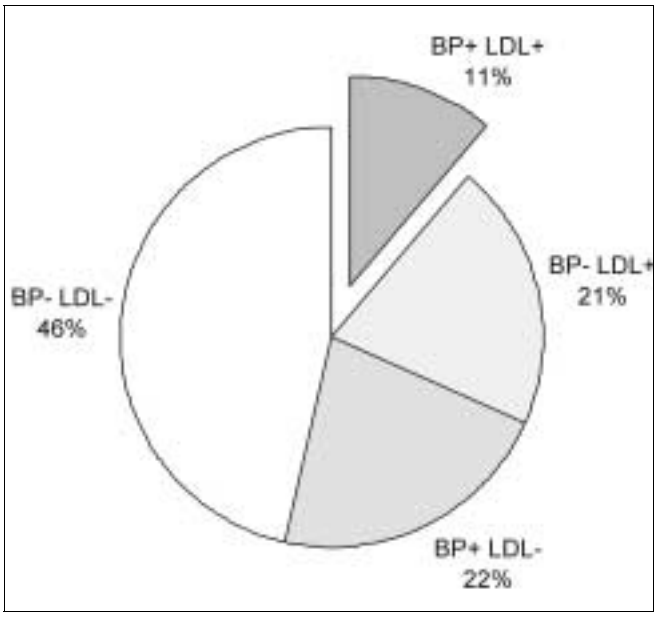

Figure 1. Rate of blood pressure and LDL cholesterol control among the patients. Blood pressure control is referred to as either BP+ (for controlled BP) or BP- (for uncontrolled BP), and LDL cholesterol control as LDL+ (for controlled LDL) or LDL- (for uncontrolled LDL).

(glucose > 126 mg/dl) between males and females. Only 4.8% of the diabetic patients were "controlled patients," and only 4.4% were "diabetic controlled patients." Some patients who were not considered diabetics also had elevated fasting glucose levels. In 302 hypertensive patients (7.9% of the non-diabetics) glucose levels were above 126 mg/dl, and 32 of them (0.8%) had levels above 200 mg/dl.

Because diabetes and the presence of TOD were the most significant factors to influence the rate of risk factor control, we divided the patients into four groups according to the presence or absence of diabetes mellitus and TOD. Results of the demographic data and risk factor analysis are shown in Table 3. Patients with diabetes and/or TOD received more antihypertensive medications (more patients received three or more drugs at maximal recommended dosage) and more antihyperlipidemic medications. Despite these extra medications, fewer patients in this group reached the treatment guideline goals for blood pressure control [Table 3].

Discussion

Medical research has proven that controlling risk factors is essential to prevent cardiovascular disease. The need to implement the guidelines for treatment is overwhelming and should be one of the principle commitments for the family practitioner. Despite this, there is growing evidence that the guidelines are not being implemented fully.

Our baseline results show that risk factor control in hypertensive patients is lacking. Only 33% of our hypertensive patients had their blood pressure controlled according to the Israeli recommendations. We found that gender, lipid-lowering medications and different target organ damage were major predictors of BP goal underachievement. Most of our diabetic hypertensive patients were not controlled (more than 95%). This is probably due, in part, to the lower target level that was required, but the number of diabetics who received "maximal treatment" was lower than in the general study population.

Other risk factors were also not controlled in the study population. We found that only 32% of the hypertensive patients had their LDL controlled, and only 11% had both BP and LDL controlled. Glucose levels were not controlled among diabetics either. Less than 30% of the diabetic hypertensive patients had fasting plasma glucose below 126 mg/dl. Given the fact that the combination of high blood pressure and diabetes has a much more deleterious effect on the kidney, this population should be carefully treated, and yet, their risk factors are poorly controlled.

The percent of undertreatment in hypertensive patients is also notable in the United States. Approximately 36% of the hypertensive patients had BP levels below the recommended target goals (according to JNC-VI) [13]. In Europe, the EUROASPIRE study also showed that blood pressure control is not optimal. Only 44.6% of congestive heart disease patients had BP levels below 140/90 mmHg in 1991, and in 1997 the results improved to 46.1%. Most countries had a 50% BP control rate: the rates of undertreatment were about 40% in Hungary and the Czech Republic and about 60% in Germany and Slovenia. According to our results, the percent of controlled hypertensives is lower than in Europe, however one should keep in mind that the population was

Table 3. Demographic data according to the presence or absence of diabetes mellitus and target organ damage

	No diabetes or TOD (n=2,586)	No diabetes, TOD (n=1,235)	Diabetes, no TOD (n=569)	Diabetes and TOD (n=558)	*P* value
Age (yrs)	62.5 ± 12.8	67.9 ± 11.5	64.5 ± 11.0	66.8 ± 10.6	<0.001
Gender (Males, %)	38.2	49.3	38.3	47.5	<0.001
Obesity (%)	40.1	42.0	53.0	45.7	<0.001
BMI (kg/m^2)	28.95.0	28.64.5	30.45.1	29.35.0	<0.001
Systolic blood pressure (mmHg)	141.0 ± 16.3	140.7 ± 16.4	141.2 ± 16.8	143.3 ± 17.3	<0.001
Diastolic blood pressure (mmHg)	84.6 ± 11.0	84.3 ± 9.6	82.9 ± 9.5	84.5 ± 10.1	<0.001
Controlled BP (%)	34.4	37.5	30.6	19.9	<0.001
Maximal treatment (%)	7.9	20.8	12.8	23.2	<0.001
LDL cholesterol (mg/dL)	135 ± 40.4	132.2 ± 43.7	133.9 ± 34.9	132.6 ± 49.8	NS
Triglycerides (mg/dL)	162.5 ± 80.0	170.7 ± 87.0	193.2 ± 103.5	201.8 ± 114.3	<0.001
Antihyperlipidemic treatment (%)	26.5	51.0	40.0	63.0	<0.001
Controlled LDL cholesterol (%)	42.3	24.6	12.1	18.1	<0.001
Patient controlled (%)*	14.4	10.0	4.9	4.7	<0.001

* Patient controlled: BP and LDL cholesterol controlled

JNC = Joint National Committee

different between the two groups (CHD patients in the EUROASPIRE study and hypertensives in the IBPC) and that the goal for our study was according to the ISH recommendations (and not under 140/90 as in the EUROASPIRE study).

Additional risk factors were suboptimally treated in the EUROASPIRE study, as in our study. Among CHD patients, lipid levels were controlled in 13.2% in EUROASPIRE I and in 41.2% in EUROASPIRE II. Our results show LDL control in 32%. Again, it should be remembered that our goal varied according to the patients (LDL between 100 and 160), whereas the EUROASPIRE study had a fixed goal of total cholesterol under 200 mg/dl. The marked improvement in the rate of lipid level control is indicative of a trend to increase the use of statins in the treatment of high risk CVD patients. However, since the results of the Heart Protection Study (advocating the use of statins in all patients) were published after those of the EUROASPIRE II, we can assume that the lipid control rate will be even higher today.

It is clear that undertreatment of all risk factors is prevalent throughout Israel, as it is in the rest of the western world. The reasons for the inadequate treatment are multiple. Poor patient compliance is partly responsible, but it is not the only parameter. Several studies showed that physicians are responsible for the inadequate control of risk factors. Physicians might not be fully aware of the new recommendations, do not record the levels of the risk factors and do not follow the response of the risk factors to the perscribed treatment [8]. Moreover, they do not update the treatment in response to the different risk factors and usually do not change the first treatment that was assigned [9]. Other factors that can affect the control rate of risk factors is the resistance of risk factors to medical treatment. In this case, strict adherence to the guidelines and prescription of several medications is crucial.

Analysis of our results according to the patients' socioeconomic status, educational status and ethnic origin would have added information for a clearer view of the problem, but this information is lacking in our database. Nevertheless, we believe that improving the quality of treatment that physicians give to their patients is the most effective tool to improve risk factor control. Therefore, our results are still valid and warrant an interventional program to help improve the control rate of risk factors in Israel.

References

1. ACC/AHA Guidelines for the Management of Patients with Acute Myocardial Infarction. Executive summary: A report of the American College of Cardiology/American Heart Association Task Force on practice guidelines (Committee on Management of Acute Myocardial Infarction). *Circulation* 1996;94:2341–50.
2. Chobanian AV, Bakris GL, Black HR, et al., for the National Heart, Lung, and Blood Institute Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; National High Blood Pressure Education Program Coordinating Committee. The seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. *JAMA* 2003;289:2560–72.
3. Fedder DO, Koro CE, L'Italien GJ. New National Cholesterol Education Program III Guidelines for Primary Prevention Lipid-Lowering Drug Therapy. Projected impact on the size, sex, and age distribution of the treatment-eligible population. *Circulation* 2002;105:152–6.
4. The Israeli recommendations for treatment and prevention of ischemic heart disease and atherosclerotic vascular disease. *Harefuah* 2000;130:1. (Hebrew)
5. The American Diabetes Association statement. *Diabetes Care* 2002;25(Suppl 1).
6. Schectman G, Hiatt J. Drug therapy for hypercholesterolemia in patients with cardiovascular disease: factors limiting achievement of lipid goals. *Am J Med* 1996;100:197–204.
7. Schrott HG, Bittner V, Vittinghoff E, Herrington DM, Hulley S. Adherence to National Cholesterol Education Program treatment goals in postmenopausal women with heart disease. The Heart and Estrogen/Progestin Replacement Study (HERS). The HERS Research Group. *JAMA* 1997;277:1281–6.
8. Pearson TA, Laurora I, Chu H, Kafonek S. The lipid treatment assessment project (L-TAP): a multicenter survey to evaluate the percentages of dyslipidemic patients receiving lipid-lowering therapy and achieving low-density lipoprotein cholesterol goals. *Arch Intern Med* 2000;160:459–67.
9. Lai LL, Poblet M, Bello C. Are patients with hyperlipidemia being treated? Investigation of cholesterol treatment practices in an HMO primary care setting. *South Med J* 2000;93:283–6.
10. Gerber J. Implementing quality assurance programs in multigroup practices for treating hypercholesterolemia in patients with IHD. *Am J Cardiol* 1997;80:57–61H.
11. EUROASPIRE Study Group. EUROASPIRE: a European Society of Cardiology survey of secondary prevention of coronary heart disease, principal results. *Eur Heart J* 1997;18:1569–82.
12. Clinical reality of coronary prevention guidelines: a comparison of EUROASPIRE I and II in nine countries. EUROASPIRE I and II Group. European Action on Secondary Prevention by Intervention to Reduce Events. *Lancet* 2001;357:995–1001.
13. Maue SK, Rivo ML, Weiss B, Farrelly EW, Brower-Stenger S. Effect of a primary care physician-focused, population-based approach to blood pressure control. *Fam Med* 2002;34(7):508–13.
14. Gavish D, Leibovitz E, Elly I, Zimlichman R. Follow-up in a lipid clinic improves the management of risk factors in CVD patients. *IMAJ* 2002;4:694–7.

CHD = congestive heart disease

IBPC = Israeli Blood Pressure Control

Correspondence: Dr. D. Gavish, Dept. of Internal Medicine A, Wolfson Medical Center, Holon 58100, Israel.
Phone/fax: (972-3) 502-8642
email: gavish@wolfson.health.gov.il

Acknowledgments:

The Israeli Blood Pressure Control Program:

Dr. Avinoam Markovitzh, Dr. Olivia Markovitz, Dr. Amiel Figenbaum, Dr. Shuki Leshem, Dr. Reuven Blumental, Dr. Miriam Cohen, Dr. Donald Silverberg, Dr. Regina Gershovitz, Dr. Mahmoud Siam, Dr. Israel Lupinski, Dr. David Sapir, Dr. Olga Moskovitz, Dr. Adiv Goldhaber, Dr. Irena Shapiro, Dr. Yana Shpreling, Dr. Agnes Miller, Dr. Rina Mindlin, Dr. Frida Glikberg, Dr. Binyamin Ashkenazi, Dr. Yevgeni Shwidel, Dr. Larisa Churnia, Dr. Hamed Bandari, Dr. Chalita Chazin, Dr. Yuri Zeldin, Dr. Irena Zeltser, Dr. Gene Shalwa, Dr. Nina Podborski, Dr. Sara Hazan Hanson, Dr. Maya Shulman, Dr. Tzila Forman, Dr. Shmuel Pasternak, Dr. Amnon Biton, Dr. Ilan Heinrich, Dr. Neta Kritz.