The Effect of a Community Hypertension Control Program

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SUMMARY A hypertension detection and control program sponsored by the Pan-American Health Organization and the World Health Organization (PAHO/WHO) was carried out in an urban health district of Havana City, Cuba. A baseline (initial) survey was conducted on a random sample of the population (≥ 15 years of age) to assess the problem of hypertension in that community. Subsequently, we extended the program in the same area by taking the blood pressure of as many people as we could, and a health education program on hypertension was developed and implemented. All hypertensive persons were treated. We surveyed about 90% of the adult population (29,640) over a 5-year period. We then conducted a final survey on a second random sample of the population to assess the effect of the program. The response rate to the letter of invitation to visit the hypertension clinic was 50%; 30% of the recall appointments were missed, and the dropout rate was 18.6%. Seventy percent of the hypertensive persons had Stage I disease (PAHO/WHO) with normal electrocardiograms. Before the program, 15.7% of the total number of hypertensive persons surveyed in the area had the disease under good control, and this increased to 31% after the program. Mortality due to cerebrovascular disease was reduced from 11/10,000/yr to 7/10,000/yr, whereas mortality caused by myocardial infarction did not change. (Hypertension 11 [Suppl I]: I-194–I-197, 1988)

KEY WORDS • blood pressure • prevalence • dropout rate • mortality • screening • health education

In Cuba the prevalence of hypertension in the adult population (15 years of age or older) is about 15% in urban areas1 and about 7.5% in rural areas. Our country was invited to participate in a Pan-American Health Organization/World Health Organization (PAHO/WHO) pilot program for community control of hypertension. The program included simultaneous action along three lines: general health education, physician education, and better care for hypertensive patients, including timely diagnosis and appropriate treatment. Our objective was to determine if a program based on this approach was feasible, effective, and efficient.

The objectives of the program were to 1) decrease the mortality caused by complications of hypertension (stroke and coronary heart disease); 2) increase the number of people aware of being hypertensive; 3) increase the number of hypertensive persons under treatment; 4) increase the number of hypertensive persons whose disease was under control; 5) classify the different types of hypertension in the community and their distribution by age, sex, and race; and 6) demonstrate the feasibility, effectiveness, and efficiency of the program.

Subjects and Methods

An urban community in Havana City with 32,694 persons aged 15 years or older was chosen for the study.

Hypertension Clinic

A hypertension clinic was established within the framework of the district's health center. Office hours of the program were Monday through Friday from 0800 to 1600. On Tuesdays and Fridays, additional time was offered from 1900 to 2100.

Baseline Survey

A random sample of 4295 persons was selected from residents of both sexes and their blood pressure was measured. The objective of this baseline survey was to assess the dimension of hypertension as a community health problem.

Eligibility for the Program

Subjects of both sexes found on three occasions to be at or above the following values were classified as hypertensive and registered.

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>15–19</th>
<th>20–29</th>
<th>30–64</th>
<th>≥ 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood pressure (mm Hg)</td>
<td>140/90</td>
<td>150/90</td>
<td>160/95</td>
<td>170/95</td>
</tr>
</tbody>
</table>

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Subjects previously diagnosed as hypertensive whose blood pressure values were below the hypertensive range because of treatment were also considered to be hypertensive. Casual blood pressure was determined in the right arm with the subject in the sitting position. The point of first appearance of an audible pulse beat (first sound) was recorded as the systolic pressure. Diastolic pressure was determined as phase 5 (disappearance of Korotkoff sounds).

**Screening**

Almost 90% of the population (29,640) was screened during the 5-year duration of the program. Several techniques were used for screening. Health education of the public included lectures and printed materials mailed or otherwise distributed. Letters were sent to the population inviting them to visit the hypertension clinic to have their blood pressure measured. We made house-to-house visits, and occupational group screening was carried out at places of work.

**Diagnostic Workup**

The basic workup was kept at a simple level. It included only the following: history, physical examination, weight, blood pressure, heart rate, serum potassium level, electrocardiograms, and urinalysis.

**Guidelines for Therapy**

The aim of treatment was to reduce blood pressure to the lowest level tolerable to the patient. Ideally, this was close to the normal range of pressure for a given age. Treatment consisted of reduction of salt consumption, maintenance of normal weight, discontinuance of smoking, physical exercise three to five times a week, mental relaxation, and medication. All patients were given some type of medication.

**Follow-up**

Patients were seen as often as was judged necessary. The interval between two visits did not exceed 3 months. The minimum information recorded at each visit included blood pressure, the therapy given since the last examination, weight, and heart rate. Once a year patients underwent a more detailed examination, which included electrocardiography, urinalysis, and determination of serum potassium.

If a patient missed an appointment, we sent him or her a letter. If he or she did not then appear, we sent a field nurse to the patient’s home. Members of the community organizations and the unions helped us to locate patients and to follow up on missed appointments and dropouts.

**Education of Health Workers and the Population**

The health workers of the area and the population were informed about the program, its objectives, methods, and expected benefits for the community. All vehicles of professional information were used: journals, meetings, seminars, and bulletins. Printed materials were also distributed. We also used local radio stations, television, videocassettes, and the press. Special emphasis was given to the benefits of controlling high blood pressure.

**Evaluation**

At the end of the fifth year the final evaluation of the program took place. A second random sample of 4325 persons was selected from the population and was studied in the same way as the baseline survey sample. The results of the second survey were compared with the findings of the initial survey.

Data for mortality caused by complications of hypertension (stroke and coronary heart disease) before and after the program were compared. Death certificates were the source of mortality data.

The number of missed appointments and dropouts, the total population screened, and the response rate to the letters and home visits were also studied in the final evaluation.

**PAHO/WHO Classification of Essential Hypertension**

Stage I: high blood pressure without evidence of organic changes in the cardiovascular system.

Stage II: high blood pressure with cardiovascular hypertrophy but without other evidence of organ damage.

Stage III: high blood pressure with evidence of organ damage attributable to the hypertensive disease (heart, kidney, cerebrovascular system).

**Classification of Blood Pressure Control**

Good: more than half of the blood pressures taken during the period were normal.

Medium: more than half of the diastolic blood pressures taken during the period were 95 to 105 mm Hg.

Poor: no response to treatment.

**Results**

Mortality due to cerebrovascular disease decreased from 11/10,000 inhabitants per year before the program to 7/10,000 inhabitants per year at the end of the program. There was no significant change in mortality caused by myocardial infarction.

Thirty percent of the recall appointments scheduled during the regular (0800–1600) office hours were missed, as well as 15% of the evening (1900–2100) appointments; 18.6% of the subjects dropped out of the program. Women attended the program more regularly than men. The response rate to the letter of invitation was 50% and to the home visits 68%.

The electrocardiograms were classified by the Minnesota Code. Seventy percent of the hypertensive participants had Stage I disease and normal electrocardiograms. The hypertensive group consisted of 95% with essential hypertension and 5% with secondary hypertension. Tables 1 to 4 provide relevant statistical data.

**Discussion**

The feasibility of the program was demonstrated at the end of the 5-year period. The support of the population and local decision makers was encouraging, and health personnel were cooperative.

Assessment of the project cost for this kind of integrated community approach is the most complicated...
The reduction in mortality due to cerebrovascular disease was significant, but mortality caused by myocardial infarction was not reduced. It seems that cerebrovascular disease is more vulnerable to blood pressure control. Moreover, almost all the patients were receiving thiazide therapy, and it may be that blood lipids increased with use of the diuretic.6,7

The distribution of hypertension by age, sex, and race had the same pattern as previously reported.8 It was more prevalent in women over 30 years of age, increased with age, and was more common in blacks than in whites. We found the more severe forms of hypertension in black people.

Table 4 shows the relation between the stage of hypertension and the response to treatment. Seventy percent of the hypertensive persons in the community had mild forms, which can be controlled easily. The most difficult problems were follow-up and patient compliance. The number of missed appointments and dropouts was very high. It is recommended that a dropout rate of no more than 10% be permitted per year.2 The response rate to the letter of invitation was very low. The North Karelia study had a 95% response rate.9

The frequency of essential and secondary hypertension was the same as in other reports.10

Conclusions

Because of the high prevalence of hypertension, this health problem must be attacked within the community at the primary care level. A program for the detection and control of hypertension with follow-up, such as the one described here, is feasible, efficient, and effective. Our study included the following findings:

- The number of persons whose hypertension was under control in the area studied had doubled at the end of the 5-year program.
- Seventy percent of the hypertensive persons in the urban health area studied were in Stage I (mild hypertension) and had normal electrocardiograms.
- Ninety-five percent of the hypertensive participants had essential hypertension; only 5% had secondary hypertension.
- Mortality caused by stroke was reduced during the study, but that due to myocardial infarction did not change.
- A high proportion of missed appointments and dropouts was encountered.

We believe that with more intensive activity within the community and a longer period of time (10, 15, or 20
years), the results would be better and the impact on
the mortality would be more impressive.

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