Four-Year Experience in a Hypertension Control Program
Operation Aspects

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SUMMARY Four-year experience with a hypertension control program in Medellin, Colombia, is reported. A simple and reproducible model is presented to be given mainly by general practitioners with follow-up care delegated to well-trained practical nurses. The model has proved efficient in avoiding dropouts and obtaining lower blood pressure readings. Survival and compliance curves indicate that both are affected for the whole length of the follow-up period. In particular, periodical evaluation allows better compliance rates. Paramedical personnel participation and educational activities are the most important strategies for improving compliance. (Hypertension 3 (suppl II): II-245-II-248, 1981)

KEY WORDS • hypertension control program • compliance • paramedical treatment • education • public health

In 1965-1966, a hypertension prevalence survey revealed an overall hypertension rate of 10% in adults (aged 15 years and older) for Colombia. Surveys 9 years later in Antioquia, a state in Northwestern Colombia, showed crude overall rates of between 10.2% and 25.1% in different small towns and some urban groups with similar age and sex composition. These findings indicated that hypertension should have top priority among public health problems in Colombia. Furthermore, mortality studies revealed that in urban areas in Colombia, as in highly industrialized countries, cardiovascular disease was the first cause of death.

With these considerations in mind, we organized, in June, 1976, a hypertension control program in Medellin, Antioquia, at the Centro Cardiovascular Colombiano, a nonprofit institution providing medical care to poor patients with cardiovascular diseases. This report covers our experience during the 4-year period (1976-1980), emphasizing operational aspects in the hypertension control program (HCP).

Methodology

The HCP was designed as a simple model for application at the primary level of a medical care system. It is low cost because it is carried out by trained general practitioners with the assistance of practical nonregistered nurses. Consultation with specialists is required only in few complicated cases. Figure 1 shows the details of the organization and objectives of the HCP. Major assignments are indicated by wide arrows. Criteria for diagnosis, treatment, and personnel duties are defined in a standard operating protocol (SOP). Three blood pressure measures were taken on different days, the first by an attending physician and the other two by a practical nurse. WHO Committee of Experts' recommendations (minimum pressure 160/95 mm Hg) were followed for diagnosing and classifying the severity of hypertension by phases. Clinical data were recorded on precoded printed forms on initial and annual examinations. Statistical analysis of data was carried out using computer systems.

To increase detection rate of hypertensive patients, we dispensed extensive information to the community about the HCP, and sponsored group educational activities promoting HCP, directed to relatives and friends of patients. To obtain an effective follow-up of all patients in the program, we took the following steps: 1) kept a patients' registry for early detection of missing control appointments; 2) engaged in an active search of missing patients by telephone or home visits; and 3) provided periodical blood pressure control by a practical nurse every 1 or 2 months. To improve compliance by hypertensive patients, paramedical personnel carried out: 1) a personalized health education program for patients; 2) wide distribution of booklets and tapes made to motivate patients to attend appoint-
OBJECTIVES

Detection and Treatment

Effective Follow-up

Improvement of Compliance

PURPOSE

Reduce complications and deaths.

RESULTS

In a 4-year period from June, 1976, to June, 1980, 1481 patients were admitted to the program. Their general characteristics are shown in table 1. The dropout rate before the program began was 38.5% according to a sample taken from medical records at the Center between 1973 and 1975. Similar figures have been reported by several authors and in a previous investigation of dropout rates in Medellin institutions. Cumulative dropout index for the 4-year follow-up period was 7.4% in our HCP. Using the actuarial method described by Fabiani and Carpentier, we calculated the compliance curve until December 31, 1980 (fig. 2), and found the dropout rate was very low during the first 30 months. In our experience, it seems that one full-time practical nurse is required for every 1500 admissions to keep the dropout rate below 10%.

Survival rate, taking in account the known deaths registered in the program, was also computed, by actuarial method (fig. 3). Unfortunately there are no previous data for comparison. Until June 30, 1980, 69 deaths were registered. The distribution of the cases in which hypertension was considered the main or contributory cause of death is shown in table 2. Most patients showed signs of target organ damage when entering into the HCP. Of 371 patients followed dur-
TABLE 1. Age, Sex, Socioeconomic, and Race Distribution of Patients

<table>
<thead>
<tr>
<th>Distribution</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (yrs)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;45</td>
<td>93</td>
<td>159</td>
<td>252</td>
</tr>
<tr>
<td>45-64</td>
<td>263</td>
<td>448</td>
<td>711</td>
</tr>
<tr>
<td>65 +</td>
<td>192</td>
<td>326</td>
<td>518</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>548</td>
<td>933</td>
<td>1481</td>
</tr>
<tr>
<td><strong>Socioeconomic status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>420</td>
<td>716</td>
<td>1136</td>
</tr>
<tr>
<td>Middle</td>
<td>128</td>
<td>217</td>
<td>345</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>548</td>
<td>933</td>
<td>1481</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Mestizo&quot;</td>
<td>—</td>
<td>—</td>
<td>1363</td>
</tr>
<tr>
<td>Black</td>
<td>—</td>
<td>—</td>
<td>30</td>
</tr>
<tr>
<td>Caucasian</td>
<td>—</td>
<td>88</td>
<td>930</td>
</tr>
</tbody>
</table>

Distribution data was computed according to the classification done by social workers based on occupation, income, and habitational status. A classification of racial group by sex was not possible.

Discussion

Cardiovascular morbidity and mortality are greatly influenced by hypertension. In Medellin, 41% of the medical consultations are due to hypertension among patients with cardiovascular complaints. There are several reports indicating a marked reduction in the morbidity and mortality rates after adequate treatment of hypertensives. In poor countries it is difficult to provide treatment to poor patients, since the traditional model of medicare is expensive. Countries with limited public health resources like Colombia need to develop new strategies for primary care to cover bigger population groups.

FIGURE 2. Compliance percent. Actuarial curve calculated according to method of J N Fabiani and A. Carpentier (Le Nouvelle Presse Médicale 6 (5 février), 1977 5)

FIGURE 3. Survival percent. Actuarial curve calculated according to method described by J.N. Fabiani and A. Carpentier. (Le Nouvelle Presse Médicale, 6 (5 février), 1977 5)
Since it is a known fact that compliance in the control of hypertension and other chronic diseases is obtained easier by paramedical personnel than physicians, we recommend the use of paramedics with the argument that they can achieve better communication and empathy with patients in long-term follow-ups. We present a model that could operate in different institutions with different economical resources because it is practical and reproducible. It has been copied and adapted in other cities in Colombia. The final impact of the program in decreasing complications and deaths could be analyzed only after greater numbers of patients are followed for longer periods of time.

Acknowledgments

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References


6. Fabiani JN, Carpentier A: La méthode actuarelle pour l'analyse statistique des résultats cliniques et expérimentaux. La Nouvelle Presse Médicale 6: 357, 1977


8. Veterans Administration Cooperative Study on Antihypertensive Agents. Effects of treatment on morbidity in hypertension. I Results in patients with diastolic blood pressure averaging 115 through 129 mm Hg. JAMA 202: 1028, 1967


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