Evaluation of a Hypertension Screening Programme in Independence, Belize

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ABSTRACT

This study assesses the effectiveness of a hypertension-screening programme in Independence, Belize. Forty-nine of the 101 patients screened were found to have elevated blood pressure readings and were advised to seek medical care. Four months later, interviews with 35 of the 49 patients from the hypertensive group revealed that 85.7% of the patients had sought medical care. Women, elderly patients and patients with a previous history of hypertension were more likely than men, younger patients and those without a history of hypertension to seek follow-up medical care. The screening programme successfully directed a high proportion of patients with elevated blood pressure to seek appropriate medical care.

Evaluación de Programa de Pesquizaje de la Hipertensión en Independencia, Belice

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RESUMEN

Este estudio evalúa la efectividad de un programa de pesquizaje de la hipertensión en Independencia, Belice. Se halló que 49 de 101pacientes sometidos al pesquizaje produjeron lecturas de alta presión sanguínea y tensión arterial, y se les aconsejó buscar atención médica. Cuatro meses después, entrevistas con 35 de los 49 pacientes del grupo hipertenso revelaron que el 85.7% de los pacientes habían buscado atención médica. Las mujeres, los pacientes mayores y los pacientes con una historia previa de hipertensión presentaban una probabilidad mayor a buscar atención médica de seguimiento, que los hombres, los pacientes más jóvenes y aquéllos sin una historia de hipertensión. El programa de pesquizaje tuvo éxito en hacer que una alta proporción de pacientes con presión sanguínea alta buscaran adecuada atención médica.

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INTRODUCTION

Morbidity and mortality from cardiovascular diseases are high in the Caribbean region (1, 2). Hypertension is the most common cause of cardiovascular disease (3, 4) and is prevalent in populations of African ancestry. Prevalence of hypertension in the Caribbean has been reported to be as high as 24% in some adult populations (5–8). Lowering blood pressure can significantly protect against cardiovascular diseases, including stroke, coronary heart disease and heart failure (9–11). As many developing countries proceed through the epidemiological transition from infectious causes of mortality to those similar to the mortality of the West, hypertension and other chronic disease screening programmes increase in importance. Blood pressure screening programmes may help to decrease the morbidity and mortality from hypertension. Such programmes are effective only if individuals diagnosed with hypertension seek appropriate follow-up medical care and receive appropriate medical treatment. Belize is well suited for such screening programmes since it has an excellent medical infrastructure that is freely accessible to its population. This study was conducted to determine how effective a hypertension screening clinic was in directing patients with abnormal blood pressure to medical care.

SUBJECTS AND METHODS

In January 2003, a group of medical doctors and nurses screened approximately 125 individuals in Independence, Belize, for diabetes mellitus, hypertension, glaucoma and visual acuity. The patients had been informed about the screening programme through radio announcements and community nurses' aides. Blood pressures were measured by a standard pneumatic sphygmomanometer and stethoscope.

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Individuals with systolic blood pressure $ 140 mm Hg or diastolic blood pressure $ 90 mm Hg were instructed to seek medical care. This included newly detected cases of hypertension as well as those with known hypertension. In May 2003, four months after the screening programme, a follow-up study was performed to determine whether these patients had sought medical attention as recommended. Through a questionnaire, the patients were asked why they did or did not seek medical care. Community nurse assistants worked with one author, to locate and interview the patients. Each of the subjects with hypertension was asked a series of questions either in person or over the phone. Chi-square tests were performed to determine statistical significance.

RESULTS

Study sample characteristics

Complete demographic and medical details were recorded for 101 individuals who were screened. Some patients left without either completing the screening or providing sufficient demographic data. Only the 101 patients (63 female, 38 male) with complete demographic and medical data were included in the study. Their ages ranged from 3 to 84 years, with the mean being 39.8 years. Thirty-two patients reported having a history of hypertension, 59 denied a history of hypertension and 10 were not sure whether they had a history of hypertension.

At the screening, 49 (48.5%) individuals were found to have elevated blood pressure, including 23 cases of newly diagnosed hypertension and 26 cases of uncontrolled hypertension. In addition, six patients had well-controlled hypertension. Among the 55 with newly or previously diagnosed hypertension, 32 (58.2%) were aware of their hypertensive status and were receiving treatment. Of these, six (18.8%) had blood pressure readings below 140/90 mm Hg. The blood pressure readings of the other 26 (81.2%) patients with hypertension were above 140/90 mm Hg. Even though the rate of hypertension in women was comparable to that of men, women had an increased frequency of awareness and control (Table 1).

Thirty-five of the 49 (71.4%) patients with abnormal blood pressure were successfully contacted for interviews. Thirty-one were contacted in person and four were reached by telephone. Seven patients were out of town; six either had moved or their addresses and phone numbers were unknown to the community nurse aides; and one was unable to complete the interview due to altered mental status. The patients interviewed were mostly females (68.6%), which is consistent with the higher rate of women (62.3%) initially screened. Women were more likely than men to be successfully contacted on follow-up visits. Twenty-four of the 30 women (80%) were successfully contacted *versus* 11 of 19 (57.9%).

When asked during the interview whether they had sought medical care as advised during the January 2003 screening, 30 (85.7%) patients answered "Yes," while 5 (14.3%) answered "No." Patients who sought medical care are referred to as the "Followed-Up" (FU) group. Those who had not sought medical care are referred to as the "No Follow-UP" (NFU) group. The FU patients sought medical care in less than one month (86.7%) or between one and two months (13.3%). None of the FU patients waited for more than two months for follow-up with a physician (Table 2).

Table 1: Extent awareness and control of hypertension in the study sample

Category	Men	Women	Total
Patients with a history of hypertension	11/38 (28.9%)	21/63 (33.3%)	32/101 (31.7%)
Patients with newly diagnosed or uncontrolled hypertension	20/38 (52.6%)	29/63 (46.0%)	49/101 (48.5%)
Patients who were aware of their hypertension status	11/23 (47.8%)	21/32 (65.6%)	32/55 (58.2%)
Treated hypertensives whose blood pressures were controlled	1/11 (9.1%)	5/21 (23.8%)	6/32 (18.8%)

Table 2: Patients who sought medical care among the 35 hypertensive patients interviewed

Question		Yes	No	Total
Did you seek medical care?		30 (85.7%)	5 (14.3%)	35
How long did you wait before seeing a doctor?	< 1 month	26 (86.7%)	–	–
	1– 2 months	4 (13.3%)	–	–
	> 2 months	0	–	–

Patients with a history of hypertension were more likely to seek follow-up medical care after the screening ($p < 0.02$). Women and elderly patients were more likely to seek follow-up than men and younger patients but the difference was not statistically significant (Table 3).

No patient found that transportation posed a barrier to seeking medical attention. Only one person (2.9%) stated that money was a barrier to seeing a doctor. This particular patient was being seen by a private physician despite the cost. Nine persons (25.7%) stated that finding time was a barrier to seeing a doctor but only two of these individuals did not have follow-up visits with a physician (Table 4).

Patients were asked a series of questions about their personal understanding of hypertension, whether they received education about hypertension during the screening and their preferred form of education. Sixty per cent of the NFU patients stated that they understood hypertension poorly compared with only 36.7% of the FU patients. Of the NFU group, none felt that they understood hypertension well compared with 36.7% of the FU group (Table 5). What each patient actually understood about hypertension was not

Table 3: Characteristics of "followed-up" subjects

Demographic category		Total	Followed-up*	p-value
Overall:		35	30 (85.7%)	
Gender:				> 0.3
	Male	11	9 (81.8%)	
	Female	24	21 (87.5%)	
History of hypertension:				< 0.02
	Yes	18	18 (100%)	
	No	17	12 (70.6%)	
Age:				0.2– 0.3
		3	2 (67.7%)	
	> 40			
	41–55	16	13 (81.3%)	
	> 55	16	15 (93.8%)	
Education:				> 0.3
	Primary or less	33	28 (84.8 %)	
	High School	2	2 (100 %)	
	College or more	0	0	

*"Followed-Up" category designates the numbers and percentages of hypertensive patients who sought follow-up medical care after having been advised to do so during the screening

Table 4: Barriers to seeking follow-up care

Question	Total: 35	FU*: 30	No FU**:5	p - value
1. Was transportation a barrier to seeing a doctor?				> 0.3
Yes	0	0	0	
No	35 (100%)	30 (100%)	5 (100%)	
Somewhat	0	0	0	
2. Was money a barrier to seeing a doctor?				> 0.3
Yes	1 (2.9%)	1 (3.3%)	0	
No	34 (97.1%)	29 (96.7%)	5	
Somewhat	0	0	0	
3. Was finding time a barrier to seeing a doctor ?				0.05–0.1
Yes	4 (11.4%)	2 (6.7%)	2 (40%)	
No	26 (74.3%)	23 (76.7%)	3 (60%)	
Sometimes	5 (14.3%)	5 (16.7%)	0	

*"FU" represents patients who followed-up
** "No FU" represents patients who did not follow-up
Transportation, money and time were generally not significant barriers to seeking medical care

tested. However, these questions assessed each patient's own personal comfort about their understanding of hypertension, which may reflect the extent to which they have been educated about hypertension.

Everyone felt that it was either very important or somewhat important to see a doctor about hypertension. Overall, 80% felt that it was very important, while 20% felt that it was somewhat important. No one stated that hypertension was an unimportant medical condition.

Fifty per cent of FU group stated that they received teaching about hypertension during the January 2003 screening, compared with only 20% of the NFU group. This difference between the two groups is consistent with the finding on the patients' self-reporting of understanding of hypertension. During the screening, patients received teaching about hypertension *via* discussions with the volunteer nurses and physicians. The patients reported that the preferred learning methods about medical issues is through someone talking or lecturing (42.9%), followed by reading material (34.4%), television (20%) and radio (2.9%).

DISCUSSION

This study was limited primarily by its size and selection bias. The number of subjects was small and patients who came to the screening were more likely to have health problems or a greater interest in their health than a random sample. These factors preclude us from making epidemiological statements about the population of Belize in general. Nonetheless, we found notable trends.

The most remarkable finding was that 85.7% of the patients with elevated blood pressure sought follow-up care. As a "snapshot" of the Belizean healthcare system, this high rate of utilization showed that the Belizean system was functioning well: patients easily accessed care and there were essentially no barriers to patients. That 34/35 patients chose to utilize the free public healthcare also indicates satisfaction with the public medical infrastructure provided by the government. The high rate of follow-up is likely driven by many factors, certainly some based on patient characteristics (patients who attend screenings are particularly interested in their health) but it speaks well of the Belizean system.

The screening revealed that roughly half of the patients in the study sample have newly diagnosed or uncontrolled hypertension. This high rate may be due to selection bias and the criterion of a one-time measurement of systolic blood pressure $ 140 or diastolic blood pressure $ 90. Several of the patients with elevated blood pressure were found to have normal blood pressure at follow-up. It is notable that one-third of the patients screened already had a history of hypertension. This rate is consistent with previous studies (1, 2, 6–8) revealing a high prevalence of hypertension in the Caribbean region.

Approximately one-third of the study patients were not aware that they had hypertension. Among those with a history of hypertension, 82% had blood pressure greater than 140/90 mm Hg. Poor patient compliance is a major challenge in treating chronic, asymptomatic conditions (12 – 14). Education about hypertension and the importance of compliance with medical treatment may help reduce this percentage.

The most significant factor in determining whether a patient followed-up with a healthcare provider after the screening was whether there was a history of hypertension ($p < 0.02$). This finding is not surprising since patients with

Table 5: Patient self-reported understanding of hypertension and their preferred method of education

Question	Total: 35	FU*: 30	No FU**:5	p - value
1. How well do you understand hypertension?				0.2 – 0.3
Poorly	14 (40%)	11 (36.7%)	3 (60%)	
Okay	10 (28.6%)	8 (26.7%)	2 (40%)	
Well	11 (31.4%)	11 (36.7%)	0	
2. How important is it for you to see a doctor for hypertension?				0.2 – 0.3
Very Important	28 (80%)	25 (83.3%)	3 (60%)	
Somewhat Important	7 (20%)	5 (16.7%)	2 (40%)	
Not Important	0	0	0	
3. Did someone educate you about hypertension during screening?				0.2 - 0.3
Yes	16 (45.7%)	15 (50%)	1 (20%)	
No	18 (51.4%)	14 (46.7%)	4 (80%)	
Maybe	1 (2.9 %)	1 (3.3%)	0	
4. What is your preferred method of learning about medical issues?				> 0.3
Talk/Lecture	15 (42.9 %)	13 (43.3 %)	2 (40 %)	
Reading material	12 (34.3 %)	11 (36.7 %)	1 (20 %)	
Television	7 (20 %)	5 (16.7 %)	2 (40 %)	
Radio	1 (2.9 %)	1 (3.3 %)	0	

known hypertension would have already received information about the disease. Furthermore, they would have been familiar with the medical care for hypertension. Probably for this same reason, elderly patients were more likely than younger patients to have other issues requiring medical care. Women had a higher follow-up rate than men, probably because men were more likely to be at work.

Doctors and nurses were available to provide medical care every weekday at the local clinic in Independence. Patients can show up at the clinic without an appointment to see a physician or to get their blood pressure checked *gratis*. Furthermore, community nurses' aides often visit the patients' homes to monitor their blood pressure.

Consultations from government-employed physicians are readily available and free to all citizens of Belize. Seeing public physicians was the choice for 34 of the 35 patients interviewed. Only one patient reported choosing to pay out-of-pocket fees to see a private doctor. Medications, such as antihypertensive drugs, are also free as long as the clinic's pharmacies have them in stock. Sometimes when the freely available medications are unavailable patients will have to pay out-of-pocket for medication from private pharmacies. Even though the study sample was small, the finding indicates that the fundamental healthcare structure exists to develop an effective preventive treatment programme for chronic diseases such as hypertension. It is significant that cost is not a barrier to care in the Belizean health system. The World Bank, among others, has shown that user fees can dramatically decrease utilization. Many of the three million Chinese who died from tuberculosis during the 1980s might have been saved had treatment been free (15). Such lessons should not be lost on chronic illnesses like hypertension which dramatically increase in importance as life expectancies rise.

Most of the patients in Independence lived within two miles of the clinic, so they walked or rode their bicycles to the clinic. Rarely did patients have to take a taxi to see the physician. This is why none of the patients reported that transportation was a barrier to seeing a doctor.

There was a notable difference in the patients' reported understanding of hypertension between the group which sought medical care and the group that did not. While this is a self-reported answer of their personal understanding of hypertension and patients were not tested on what they actually understood about hypertension, it is noteworthy that none of the five NFU patients stated that they understood hypertension "well."

All of the patients in the study believed that hypertension was an important issue, and most sought medical care as recommended. Medication compliance for the treatment of a chronic, asymptomatic disease is always a challenge. In this study, education was an important factor in improving follow-up and it was found that a screening programme can help provide patients with information about the need for follow-up and treatment. Low cost programmes such as this provide an effective way of getting at risk individuals into treatment and are more cost effective than treating the complications of hypertension.

This screening programme, despite its limited scope, detected 22 patients without a previous history of hypertension and 27 patients with poorly-controlled hypertension. Considering that 85.7% of the patients sought medical advice within two months as recommended, this screening programme was successful. This follow-up rate is comparable to or higher than similar studies on physician follow-up rates (16 – 18).

This screening programme demonstrates that patients can be effectively directed to appropriate medical care for hypertension. Screening programmes should be coupled with education that focuses on the necessity to treat asymptomatic hypertension to prevent serious cardiovascular illnesses such as stroke and myocardial infarction. Approximately half of the patients reported that they did not receive 'education' during screening; so there is still much room for improvement. Medical education must be further reinforced at the visits to the doctors, nurses and nurses' aides as patients prefer to learn about their diseases by direct communication.

Finally, it is significant that a fourth year medical student was actively involved in this study. The 1990s saw a markedly increased interest in international health service by

medical students and this has continued. The screening study, designed in cooperation with local health professionals and directed to answer locally pressing questions, represents a good opportunity to harness the interest, energy and abilities of medical students interested in working on international medical projects.

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