









Characterization of prevalence and mortality from arterial hypertension in Cuba, 2009-2018 decade

Caracterización de la prevalencia y mortalidad por hipertensión arterial en Cuba, decenio 2009- 2018

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ABSTRACT

Introduction: High blood pressure was the main factor associated with premature mortality, causing almost 10 million deaths and more than 200 million disability-adjusted life years in the world, also being the factor that causes the majority of deaths due to cardiovascular causes. It is a silent disease that rarely causes symptoms in early stages of the disease. It is usually not diagnosed promptly.

Objective: To characterize the prevalence and mortality due to arterial hypertension in Cuba in the 2009-2018 decade.

Material and Methods: An ecological study was carried out on arterial hypertension in Cuba. Dispensarization, gross mortality rates due to diseases of the circulatory system, heart diseases and hypertensive diseases were taken into account in the 2009-2018 decade. The source of information was made up by the statistical yearbooks corresponding to those years published by the National Directorate of Statistics of the Ministry of Public Health.

Results: The total prevalence of arterial hypertension in Cuba presented a slight increase in the decade. It was more frequent in the female sex. Mortality rates from hypertensive diseases exhibited an increasing trend.

Conclusions: The prevalence rates of arterial hypertension reported in Cuba in the first level of health care were in the intermediate range between the world figures and the region of the Americas. In the decade, its general prevalence showed a slight increase, while mortality from hypertensive diseases almost doubled, which suggests the need to optimize the active screening for arterial hypertension.

Keywords:

arterial hypertension, cardiovascular diseases, mortality, Cuba, risk factor.

RESUMEN

Introducción: la presión arterial elevada, fue el principal factor asociado con mortalidad prematura, tras causar casi 10 millones de muertes y más de 200 millones de años de vida ajustados por discapacidad en el mundo y el que más muertes, de causa cardiovascular, origina. Es una enfermedad silenciosa, raramente causa síntomas en las primeras etapas, por lo general, no se diagnostica oportunamente.

Objetivo: caracterizar la prevalencia y mortalidad por hipertensión arterial en Cuba, en el decenio 2009- 2018.

Material y métodos: se realizó un estudio ecológico, sobre la hipertensión arterial en Cuba. Se tuvieron en cuenta, la dispensarización, las tasas de mortalidad brutas por las enfermedades del sistema circulatorio, del corazón y las hipertensivas en el decenio 2009- 2018. Los anuarios estadísticos publicados por la Dirección Nacional de Estadísticas, del Ministerio de Salud Pública de esos años fueron la fuente de información.

Resultados: la prevalencia total de la hipertensión arterial en Cuba presentó un ligero aumento en el decenio. Fue más frecuente en las personas del sexo femenino. Las tasas de mortalidad por enfermedades hipertensivas exhibieron una tendencia al incremento.

Conclusiones: las tasas de prevalencia de hipertensión arterial reportadas en Cuba en el primer nivel de atención de salud estuvieron en el rango intermedio entre las cifras mundiales y la región de las Américas. En el decenio su prevalencia general mostró un ligero incremento, en tanto que la mortalidad por enfermedades hipertensivas casi se duplicó, lo que sugiere la necesidad de optimizar la pesquisa activa de hipertensión arterial.

Palabras claves:

hipertensión arterial, enfermedades cardiovasculares, mortalidad, Cuba, factor de riesgo.



INTRODUCTION

Arterial hypertension (AHT) has increased by 90 % in the World during the last four decades. Most of this increase has occurred in low- and middle-income countries, driven by population growth and aging.⁽¹⁾ The global prevalence of AHT in adults over 18 years old was 22 %.⁽²⁾ AHT was the main factor associated with premature mortality, causing almost 10 million deaths and more than 200 million disability-adjusted life years in 2015.⁽³⁾ In 2017 there were 10,44 million deaths from this cause.⁽⁴⁾ It is the risk factor (RF) that causes more deaths from cardiovascular causes in the World.^(4,5)

Heart disease was the leading cause of death in Cuba in the 2009-2018 decade, except for the years 2012, 2013 and 2014 which were surpassed by malignant tumors.⁽⁶⁾ Among heart diseases, ischemic diseases were the most frequent and secondly, hypertensive diseases, except for the years 2009 and 2011 which ranked third in this group.⁽⁶⁾

In adults, AHT is defined as the elevation of systolic blood pressure (SBP) to 140 mm Hg or higher or diastolic blood pressure (DBP) to 90 mm Hg or higher or both values.^(7,8,9) It is a silent disease, rarely causing symptoms in the first stages, so it is usually not diagnosed early.⁽¹⁰⁾

AHT contributes to the burden of heart disease, cerebrovascular disease, kidney failure, disability, and premature mortality.⁽¹⁰⁾ Its control is prioritized as a care entry point for cardiovascular diseases (CVD).⁽¹¹⁾

A controlled hypertensive person is the one who is diagnosed and registered with hypertensive treatment in a health institution, whose blood pressure is SBP <140 mm Hg and DBP <90 mm Hg⁽¹¹⁾ in adults under 60 years old. In adults over 60 years old, SBP \geq 160 mm Hg is considered under control, although it should be reduced to 140 or 150 mm Hg if they are in good physical and mental conditions.⁽⁷⁾

Uncontrolled AHT in Cuba was associated, approximately, with a doubling of the risk of suffering premature death from CVD.⁽¹²⁾ Its control is related to the efficacy of pharmacological treatment and the adherence to it.⁽⁸⁾ The rate of control of AHT is related to the effectiveness of the clinical programs to monitor it.⁽¹¹⁾

Cardiovascular risk (CVR) is defined as the probability that a person will develop a cardiovascular event during a defined period.⁽⁸⁾ It is proportional to the control of AHT; the more controlled, the lower the risk. The epidemiological association between the two is observed from SBP values > 115 mm Hg.⁽⁸⁾

The cardiovascular benefits of normal blood pressure are obtained with figures as low as SBP = 105 mm Hg and DBP = 60 mm Hg. Normal blood pressure figures are important for the efficient function of vital organs such as the heart, brain, kidneys, and for overall health and well-being.⁽¹⁰⁾

Among the vascular risk factors, AHT was the most significant modifiable causal factor for the occurrence of cerebral infarction.⁽¹³⁾ Also, 51 % of deaths from cerebrovascular diseases and 45 % of those caused by ischemic heart diseases are attributed to systolic hypertension.⁽¹⁴⁾ It is the most frequent risk factor for damage to the blood vessels,⁽¹⁵⁾ causing arteriosclerotic structural changes in the walls of the arteries⁽⁸⁾ which leads to an increase of the risk for CVD and kidney failure.⁽¹⁴⁾

Structural or functional alterations of blood vessels and/or organs caused by AHT, including the brain, heart, kidneys, central and peripheral arteries, and eyes, is defined as damage to the target organs.^(8,9) This deterioration confers the patient a high CVR.⁽⁹⁾

A large proportion of cardiovascular diseases and deaths as a consequence of it can be avoided if we control risk factors^(16,17) such as: inadequate diet, harmful consumption of alcohol, smoking and physical inactivity. In the diet, the reduction in salt consumption may be the greatest contributor to prevention.⁽¹⁰⁾

The work carried out by the National Technical Advisory Commission of the Arterial Hypertension Program of the Ministry of Public Health in the preparation of the Cuban Guide for the Diagnosis, Evaluation and Treatment of Arterial Hypertension, puts in the hands of all health professionals a useful and valuable instrument which allows comprehensive treatment of all patients as a basis for achieving disease prevention and control, and with it, the reduction of individual and population CVR.

Given the problem and challenge that this health situation is for the country, we set ourselves as the **objective** of this research: to characterize the prevalence and mortality of AHT in Cuba in the 2009-2018 decade.

MATERIAL AND METHODS

An ecological study was carried out to characterize the prevalence and mortality from AHT in Cuba in the 2009-2018 decade.

For the study of the series and the analysis of frequency and mortality due to AHT we took into account the codes for hypertensive diseases (I10-I15 codes), listed in the revision of the International Classification of Diseases, Tenth Revision (ICD-10), from 2009 to 2018.⁽¹⁸⁾

Crude mortality rates were taken into account by years at all ages due to diseases of the circulatory system, heart diseases and hypertensive diseases in Cuba as well as the mortality rates for the latter, according to age group and sex in the period 2009-2018. In addition, the prevalence of AHT was explored according to sex as well as the management and control of hypertensive patients in the years 1995, 2001 and 2010, according to the results obtained from National Health Surveys.⁽¹⁹⁾

The source of information for this work was the Statistical Yearbooks published from 2010 to 2019 by the National Statistics Office (DNE) of the Ministry of Public Health (MINSAP) of the Republic of Cuba, corresponding to the years 2009 to 2018.⁽⁶⁾ Global data is based on the most recent years available (2015 and 2016). The data were analyzed in an automated way. An Excel spreadsheet was created. Descriptive statistics (frequencies) were used.

For this work, we used information published by the DNE, accessible in full text, without limitations. The data was taken from public records with non-identifiable reports of the patients, so there are no ethical conflicts.

RESULTS

The total prevalence rate of AHT per 100 inhabitants in Cuba according to the dispensarization registered by the Statistical Public Health System from the Primary Health Care, presented a slight increase from 2009 to 2018 of a little more than two percentage points. In all years, the disease was more frequent in women, between three and four percentage points, compared to men. (Fig. 1).

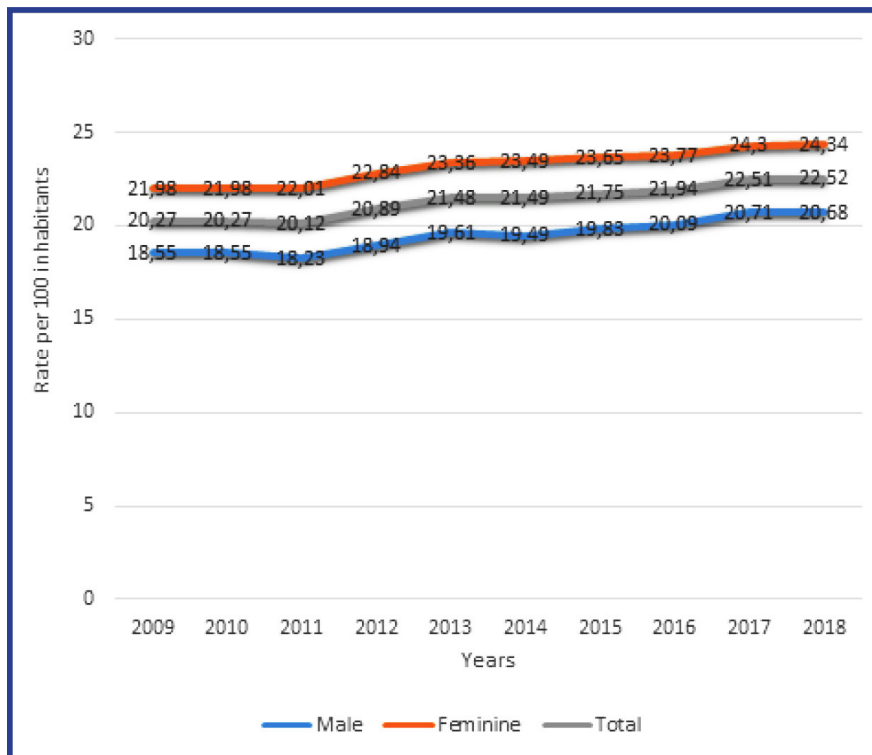


Fig. 1 - Prevalence of arterial hypertension by sex and total. Cuba 2009- 2018

Source: 2009-2018 Statistical Yearbooks of Health, Cuba

The prevalence rates of AHT identified from National Health Surveys in 1995, 2001 and 2010 exceeded by more than ten percentage points that reported by dispensarization, according to the Statistical Yearbooks of Health.⁽⁶⁾

A marked increase in the number of people dispensarized with the diagnosis of hypertension was observed from 1995 to 2001, but not in 2010.

Hypertensive patients were below the global prevalence and close to those of dispensarization, except in 1995 when more than double was reported. Hypertensive treated patients ranged from 63,5 to 89,3 %. Control in treated patients reached a maximum of 55,1 %. (Fig. 2).

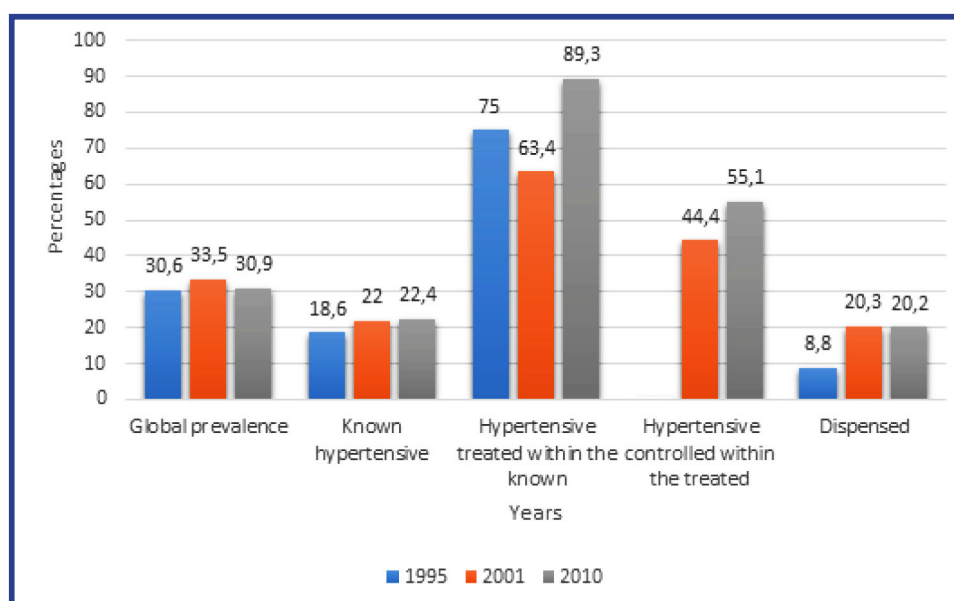


Fig. 2 - Management and control of known hypertensive patients. Cuba 1995, 2001, 2010

Source: III ENFR, Cuba 2010.

An increase in mortality rates from diseases of the circulatory system, which include heart disease and hypertensive diseases that are also heart diseases, was observed between 2009 and 2018. The highest rates in this period were presented in 2017, followed by those of 2018. (Fig. 3).

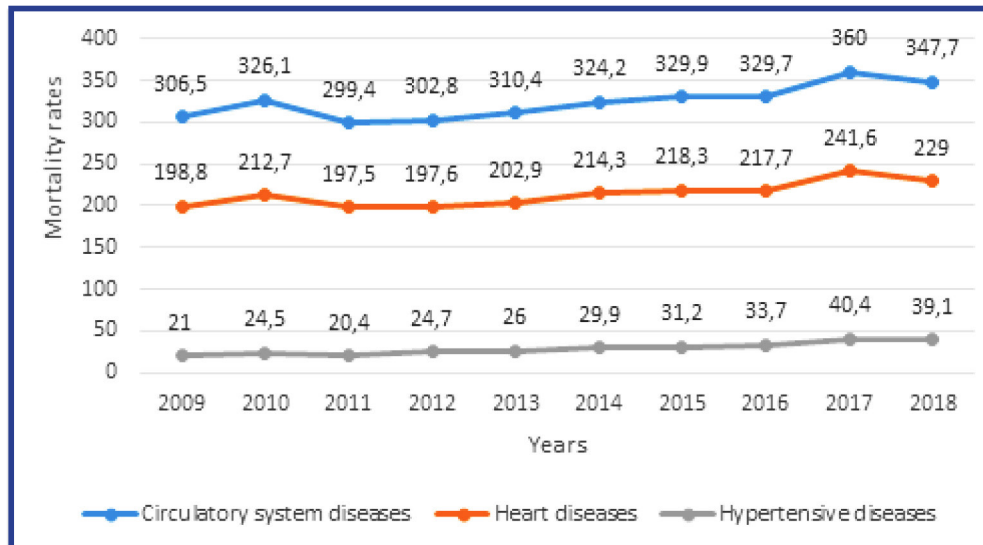


Fig. 3 - Mortality rates for the circulatory system, heart and hypertensive diseases. Cuba 2009- 2018

Source: 2009-2018 Statistical Yearbooks of Health, Cuba.

Heart diseases were the leading cause of death in all ages in this decade, except for the years 2012, 2013 and 2014.

Hypertensive diseases were the second cause of death in the group of heart diseases during this period, except for the years 2009 and 2011, when they constituted the third case.⁽⁶⁾

Mortality rates from hypertensive diseases increased from 2009 until 2018, from 21 to 39,1 per 100,000 inhabitants. An upward linear trend was observed. (Fig. 4).

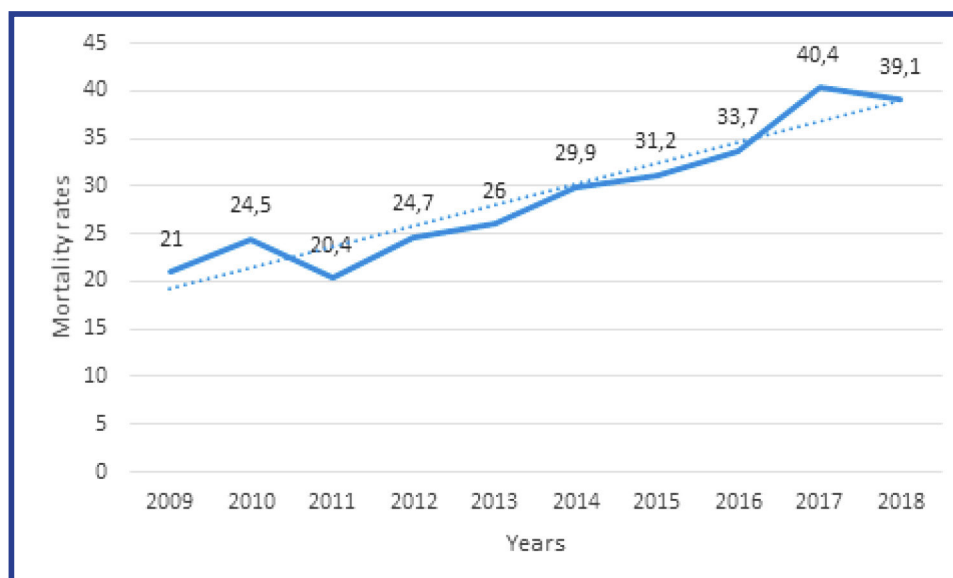


Fig. 4 - Hypertensive disease mortality rates and trends. Cuba 2009- 2018

Source: 2009-2018 Statistical Yearbooks of Health, Cuba

Mortality rates from hypertensive diseases increased with age, the highest increase was in the group of 80 years old and more. There was a growth in mortality rates in totals by sex, comparing years 2009 and 2018. Mortality rates in 2018 were the highest of all with respect to the results until 2016, since those of 2017 exceeded them in all ages, except in men between 20-39 years old and in women between 40-59 years old.

In the years in which mortality rates were recorded in those patients under 20 years of age, these rates were equal for all years. By sex, mortality rates were higher in males, except in the group of 80 years old and more, and in the total for the years 2009 and 2014, which were exceeded by those of females. (Table).

Table - Mortality rates from hypertensive diseases by age group and sex. Cuba 2009-2018

Age	<20		20-39		40-59		60-79		80 and over		Total	
	M	F	M	F	M	F	M	F	M	F	M	F
2009	-	-	1.2	0.7	13.4	10.1	77.2	63.8	271.9	298.7	21.1	21.8
2010	-	0.1	1.2	1.1	14.0	8.6	82.2	67.1	322.4	321.8	24.4	24.1
2011	-	0.1	0.7	0.5	11.1	7.6	78.7	67.5	323.6	290.5	23.3	23.0
2012	0.1	0.1	1.1	0.8	14.3	8.3	77.2	64.6	319.6	310.4	24.0	23.5
2013	0.1	-	1.2	0.6	13.8	9.4	84.9	66.8	380.9	325.7	27.1	25.0
2014	-	-	1.3	0.7	15.5	9.6	96.5	78.1	396.0	417.7	29.7	30.1
2015	-	-	1.2	0.5	15.1	9.4	96.0	77.5	441.6	394.4	31.5	29.6
2016	0.1	-	1.3	0.8	15.1	8.7	102.5	82.5	486.7	462.3	34.2	33.2
2017	0.1	-	1.5	0.8	18.3	11.0	115.8	96.5	543.6	525.2	40.6	40.5
2018	0.1	-	1.6	0.6	19.3	12.7	111.6	89.9	487.4	477.1	39.3	38.9

Rates per 100,000 inhabitants. Source: 2009-2018 Statistical Yearbooks of Health, Cuba.

DISCUSSION

In the 2009-2018 decade, the prevalence of AHT in Cuba showed a slight increase. By sex, women were more affected; however, in the World and the Americas men showed higher rates.^(2,20) The authors think that the higher national prevalence of the disease in females could be explained by a higher demand for health care in this sex within the context of a predominantly passive diagnosis based on the patient's request for medical attention.

In 2015, the global prevalence of AHT in adults over 18 years old was 22 %, so one in four men and one on five women suffered from it.⁽²⁾ In America, it was 17,6 % in adults; by sex, it was 20,3 % in men and 14,8 % in women.⁽²⁰⁾ In Cuba, it was 21,75 %, which was in line with that registered in the World, surpassing the Americas. However, women predominated in a 23,65 %, ⁽⁶⁾ as in Bermuda (year 2014) and Curaçao (year 2017).⁽²¹⁾ In the World, belonging to the male sex has been considered to be another RF to suffer AHT.⁽⁹⁾ Guatemala and Honduras presented similar prevalence of AHT to Cuba in the area.⁽²¹⁾

The three National Health Surveys of Cuba (years 1995, 2001 and 2010) have shown repeated prevalences of AHT⁽¹⁹⁾ which are higher than the figures reported by the Primary Health Care, according to the Statistical Yearbooks of the MINSAP in those years. In other words, there was a significant number of people with the disease who had not been diagnosed by the Primary Health Care; therefore, this registry gap is probably linked to poor care and follow-up of unknown patients who are consequently not controlled. Furthermore, almost half of the hypertensive patients treated were not controlled.

A work that includes the education of the population, families and individuals in the prevention of risk factors for the appearance and development of AHT, about the knowledge of the disease and its consequences, as well as an active research to carry out early diagnoses and timely treatments which guarantee monitoring and control of the disease becomes necessary.

In all of America, the best results for the control of AHT were exhibited by Canada (68 %),⁽²²⁾ which exceeded what was identified in Cuba. In the US, 34 % of the population had AHT, approximately 76 % took antihypertensive drugs, but only 54,4 % were controlled.⁽²³⁾ This control is similar to that observed in Cuba in 2010.⁽¹⁹⁾ In Latin America and the Caribbean, around 80 % of hypertensive people did not have adequate blood pressure control, only one in five did. This was exceeded in Cuba.

The rate of AHT treatment is related to the effectiveness of the Health Care System, since it allows the appropriate medication and other therapeutic actions for each patient who suffers from it. Untreated AHT speaks of the need for interventions in which treatment provides the greatest benefits with respect to costs.⁽¹¹⁾ The frequency and severity of diseases and complications derived from untreated AHT, mainly in the medium and long term, establish the need for interventions at the primary level of care with a view to reversing this situation, especially in the case of the Cuban population, with increasing percentages of individuals at the most advanced ages.

In the study on mortality by Cairo Sáez et al.⁽²⁴⁾ it was observed that suffering from AHT was associated with high cardiovascular mortality, in contrast to those without it.

Strong indicators, which measure blood pressure control, are mortality rates such as death rates caused by AHT-related illnesses: death rates from cerebrovascular accidents, from ischemic heart disease, and from hypertensive diseases.⁽¹¹⁾ They all are included within the circulatory system diseases that were the main cause of death in the 2009-2018 decade in Cuba and exhibited an increasing trend in that period.

As age increased, so did mortality from hypertensive diseases in Cuba throughout the decade. The same happened in the World in 2016, in which, after five years old, with increasing age, mortality from hypertensive diseases also increased. In addition, more women than men died,⁽²⁵⁾ not being the case of Cuba, where more men died during that year and generally, in the decade.

Mortality from hypertensive diseases in the World in 2016 was 1,6 %, with a crude rate of 12 per 100,000 inhabitants; in upper-middle-income countries it was 2,2 % with a crude rate of 16,2⁽²⁵⁾ and in Cuba it was 3,74 % with a crude rate of 33,7.⁽⁶⁾ According to mortality data published in 2017, deaths in the US from AHT reached 9,1 %. Approximately 77 % of people who had their first stroke had blood pressure levels greater than 140/90 mm Hg.⁽²³⁾

AHT is a serious health problem with significant repercussions on the mortality picture in the country and in the World. Its prevention and control will depend on its reduction, and with it, the morbidity and mortality from CVD.

It is essential to reduce the incidence of AHT through interventions aimed at reducing behavioral RF in the entire population, early detection, and taking all of them into account in order to prevent heart attacks, strokes and other complications.⁽¹⁷⁾

Every effort to reduce AHT has a favorable impact on cardiovascular morbidity and mortality.⁽⁹⁾ The early detection, adequate treatment and good control of AHT are benefits for health and the economy.⁽¹⁰⁾

An efficient measure would be the education of the population in the knowledge of AHT and its consequences, as well as in the prevention of RF for their appearance and development. In healthcare, it would be necessary to systematically carry out active investigations of AHT in the general population and in possible risk groups, in order to carry out an early diagnosis, timely treatment and its dispensarization, thus guaranteeing the adequate monitoring and individualized control of this condition. This would contribute decisively to the reduction of morbidity and mortality from diseases related to AHT.

CONCLUSIONS

The prevalence rates of AHT reported in Cuba at the Primary Health Care were in the intermediate range between the World and the Americas. Unlike what was reported in the World and the Americas, Cuba had a higher prevalence of AHT in females.

In the decade, the general prevalence of AHT showed only a slight increase, while the mortality from hypertensive diseases almost doubled. These findings suggest the need to optimize active systematic screening for AHT at the Primary Health Care throughout the country.

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Conflicts of interest

The authors declare that there are no conflicts of interest.

Authorship contribution

Moura Revueltas Agüero: Study design, database elaboration, information processing, analysis and discussion of the results, writing of the manuscript, critical revision of the manuscript.

Enrique Molina Esquivel: Analysis and discussion of the results.

Maritza Benítez Martínez: Study design, analysis and discussion of the results, writing and critical revision of the manuscript.

María del Carmen Hinojosa Álvarez: Search and timeliness of bibliographic references, writing and critical revision of the manuscript.

Silvia Venero Fernández: Analysis and discussion of the results.

José A. Betancourt Bethencourt: Analysis and interpretation of data. Statistical consulting.

All the authors participated in the discussion of the results and we have read, reviewed and approved the final text of the article.