

Assistance Network and Morbi-Mortality Pattern of Hypertension in a Metropolitan Area of Northeast Brazil

ORIGINAL

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Abstract

The aim of this study is to know the assistance network and the morbi-mortality pattern of hypertension in a metropolitan area. A search was performed in the government platforms to determine the assistance network for patients with hypertension in the city of Fortaleza, Northeast Brazil. We have reviewed the database in the period from 2010 to 2014 to investigate the hospital admissions and deaths due to hypertension and its related diseases. 23,709 patients are registered with diagnosis of hypertension. Primary care is given in 92 health centers, and the specialized care is provided in 112 units. Tertiary attention is given in 4 reference hospitals. Hypertension was the main cause of death in 67 patients admitted in that period, and cardiovascular diseases were responsible for 7,955 deaths. The assistance network for hypertension is well structured in this city, but due to the increasing population there is need to expand this network.

Introduction

Hypertension is a multifactorial condition characterized by sustained high levels of blood pressure. Hypertension is considered as blood pressure $\geq 140 \times 90$ mmHg [1]. The main risk factors includes age (direct association), overweight/obesity, salt and alcohol consumption, race (a higher prevalence is observed among non-white people), gender (more common in men) and sedentarism [1]. Hypertension is an independent risk factor for coronary disease and stroke and is also the main cause of morbidity and mortality in the world [2]. Recently

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Keywords

Hypertension; Delivery of Health Care; Primary Health Care; Morbidity; Mortality.

concern has been devoted to adequate detection, evaluation and treatment of hypertension, which results in complications such as heart failure and chronic kidney disease [2].

Hypertension is an important problem of public health, with prevalence ranging from 22.3% to 43.9%, depending on the studied population, geographical region and diagnosis criteria [3]. It is estimated that hypertension causes approximately 7.5 million deaths each year worldwide, which corresponds to 12.8% of all causes of death [4].

Methods

This is a retrospective study performed through Brazilian government databases (<http://www2.datasus.gov.br>) and registries to draw the current assistance network for patients with hypertension in the city of Fortaleza, Ceara State, Northeast of Brazil. We have also investigated these databases to characterize the burden of hypertension and its related diseases in the number of hospital admissions and deaths in our region in the period from January 2010 to December 2014. To analyze admission cases we have considered the International Classification of Diseases (ICD-10) [5], and included the cases registered with ICD-10 I10-I15 (Hypertensive disease, HD) and I00-I99 (Diseases of the Circulatory System, DCS). An analysis of admissions due to HD and DCS, as well as deaths caused by these diseases, was done.

Results and Discussion

In the State of Ceará, Northeast of Brazil, diseases of the circulatory system cause significant mortality occupying the first place as cause of death. Between the years 2000 to 2004 a total of 271,300 deaths due to cardiovascular diseases were registered in our State, and 11,546 in the city of Fortaleza [6]. These deaths occur predominantly in regions with a higher number of poor people in our country, such

as Northeast and Amazon region due to precarious health care assistance [7].

In general, hypertension is asymptomatic and is frequently diagnosed during medical visits due to other diseases. Headache complain is not always related to hypertension. However it is important to consider this symptom in patients with hypertension because it can be associated with accelerated hypertension. During clinical evaluation there should be considered the occurrence of sudden blood pressure elevations, with headache, tachycardia, pallor and diaphoresis, which can represent secondary hypertension [8].

Hypertension has become an important problem of public health, particularly in developing countries, where it has an estimated prevalence of 37.3%. Projections to the year 2025 suggest that 75% of people with hypertension will be living in emergent countries [9]. In a recent study, a 6% decrease in the prevalence of hypertension in Brazil was observed, but it is still around 30% [9]. There are few studies about hypertension among children and adolescents in our region. Magliano et al. [10], in a systematic review of 3,631 articles, of which 17 were included in the analysis, found a prevalence of 8.1% of hypertension in adolescents, and it was more prevalent among boys.

The main complications of hypertension are stroke, myocardial infarction and chronic kidney disease (CKD) [11]. CKD is currently considered an epidemic, with an increasing number of patients in dialytic treatment. In Brazil the main cause of CKD is hypertension, and this is probably due to a poor control of blood pressure levels in the primary care settings, associated with a patients' poor adherence to treatment. The number of patients in dialytic treatment in Brazil was estimated in 97,586 in July 2012, when the last dialysis census was done. The number of patients that started dialytic treatment in 2012 was 34,366. The number is increasing: there were 42,695 in the year 2000, 92,091 in 2010 and 91,314 in 2011 [12]. In

Fortaleza city and metropolitan region there are 13 dialysis center, where specialized follow-up is provided for patients with CKD, including patients with hypertension and CKD that still do not need dialysis. There are approximately 1,600 patients in dialytic treatment in Fortaleza city, and around 70% have hypertension.

In the year 2010, the population of Ceará State was 8,452,381 inhabitants, with a 13.8% increase in comparison with the year 2000 (7,430,661 inhabitants). In December 2011, there were 555,020 patients with hypertension diagnosis in Ceará State. The number of medical specialized consultations varied from 3,126,981 to 4,696,411 in our region.

In Fortaleza city, which is divided in 6 regional secretaries, in November 2014, a total of 23,709 patients with hypertension were registered, which corresponds to 4.2% of patients with this disease in Ceará State. Primary care for patients with hypertension is provided in 92 health care centers. Specialized treatment is done in 112 health care facilities, including hospitals and ambulatory services. Tertiary attention is done in 4 reference hospitals. There also is an emergency-specialized hospital in Fortaleza, which is responsible, in the context of hypertension, for the treatment of hypertensive emergencies, including stroke.

In a recent study conducted in Fortaleza city with adolescents, a prevalence of 25.2% of hypertension was detected among males and 17.6% in females [3]. In another study, conducted in a reference hospital in Fortaleza, a total of 426 patients were admitted with diagnosis of stroke from July to September 2008, and hypertension was observed in 97% of them, evidencing this as the main risk factor for stroke [13]. Other important complication, CKD, was investigated in this city, by Araújo et al. [14]. A total of 2,637 individuals were interviewed during campaigns of the "World Kidney Day", and hypertension was found in 34.3% of them.

Hypertension and its complications are responsible for high morbidity and mortality in Fortaleza's metropolitan area. Between the years 2010 and 2014, there were 1,222 admissions due to hypertension (0.12% of a total 957,471 admissions), and 97,901 admissions due to DCS (10.2% of total), as summarized in **Tables 1** and **2**.

Hypertension was the cause of death in 67 patients admitted in that period (0.16% of a total 39,699 deaths), and DCS in 7,955 (20% of total) (**Tables 3** and **4**).

Table 1. Hospital admissions due to Hypertension in the city of Fortaleza, Ceará, Brazil, between 2010 and 2014.

Year	Number of admissions due to Hypertension	Total Number of Admissions
2010	390	190931
2011	289	191730
2012	179	186052
2013	186	200500
2014	178	188258
Total	1222	957471

Source: DataSUS.

<http://www2.datasus.gov.br/DATASUS/index.php?area=02>

Table 2. Hospital admissions due to Diseases of the Circulatory System in the city of Fortaleza, Ceará, Brazil, between 2010 and 2014.

Year	Number of admissions due to Diseases of the Circulatory System	Total number of admissions
2010	18909	190931
2011	18792	191730
2012	19240	186052
2013	21815	200500
2014	19145	188258
Total	97901	957471

Source: DataSUS.

<http://www2.datasus.gov.br/DATASUS/index.php?area=02>

Table 3. Mortality due to Hypertension, among patients admitted to hospitals, in the city of Fortaleza, Ceará, Brazil, between 2010 and 2014.

Year	Number of deaths due to Hypertension	Total number of deaths
2010	20	8064
2011	15	7705
2012	9	7953
2013	14	8313
2014	9	7664
Total	67	39699

Source: DataSUS.

<http://www2.datasus.gov.br/DATASUS/index.php?area=02>

Table 4. Mortality due to Diseases of the Circulatory System, among patients admitted to hospitals, in the city of Fortaleza, Ceará, Brazil, between 2010 and 2014.

Year	Number of deaths due to Diseases of the Circulatory System	Total number of deaths
2010	1561	8064
2011	1608	7705
2012	1639	7953
2013	1706	8313
2014	1441	7664
Total	7955	39699

Source: DataSUS.

<http://www2.datasus.gov.br/DATASUS/index.php?area=02>

Conclusion

The assistance network for patients with hypertension in the metropolitan area of Fortaleza, Northeast of Brazil, which is the 5th larger city in Brazil, is well structured, but, due to the increasing population of this region, there is a need to expand this network. Hypertension is an important cause of morbidity and is still responsible for a high number of deaths in our region. Health promo-

tion strategies, including the adoption of healthier habits, such as low-salt diet and physical activity practice, are required and must be stimulated, in order to prevent cardiovascular diseases and its complications. Also a more careful attention must be done for patients with a confirmed diagnosis of hypertension, making efforts to increase patients' adherence to treatment.

Conflict of Interest

None.

Financial Support

This research was supported by the Brazilian Research Council (Conselho Nacional de Desenvolvimento Científico e Tecnológico, CNPq).

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