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HOSPITALIZATIONS AND DEATHS BY DIABETES MELLITUS

Internações e óbitos por Diabetes Mellitus

Hospitalización y muertes por Diabetes Mellitus

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ABSTRACT

Objective: to analyze the profile of hospitalizations and mortality due to Diabetes Mellitus in Piauí between 2015 and 2019. **Method:** cross-sectional, descriptive and quantitative study, carried out using secondary data for the years 2015 to 2019, extracted from the Department's website of Informatics of the Unified Health System. The study population consisted of all hospitalizations and deaths from Diabetes Mellitus of people residing in the State of Piauí. **Results:** 18,361 hospitalizations for Diabetes Mellitus were registered, of which 527 died, with a mortality rate of 2.87 per 100 hospitalizations. Hospitalizations predominated in women, browns and aged between 60 and 69 years. Deaths were predominant among women, browns and elderly women. **Conclusion:** to reduce morbidity and mortality from Diabetes Mellitus, it is necessary to strengthen Primary Health Care in order to improve care and, thus, screening and treatment.

DESCRIPTORS: Health profile; Hospitalization; Mortality; Diabetes mellitus.

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RESUMO

Objetivo: analisar o perfil das internações e da mortalidade por Diabetes *Mellitus* no Piauí entre os anos de 2015 e 2019. **Método:** estudo transversal, descritivo e quantitativo, realizado através de dados secundários referentes aos anos de 2015 a 2019, extraídos do *site* do Departamento de Informática do Sistema Único de Saúde. A população do estudo foi composta por todas as hospitalizações e óbitos por Diabetes *Mellitus* de pessoas residentes no Estado do Piauí. **Resultados:** Foram registradas 18.361 hospitalizações por Diabetes Mellitus, das quais 527 evoluíram a óbito, com taxa de mortalidade de 2,87 por 100 internações. As hospitalizações predominaram em mulheres, pardas e com idade entre 60 e 69 anos. Nos óbitos houve predomínio entre as mulheres, pardas e idosas. **Conclusão:** para reduzir a morbimortalidade por Diabetes *Mellitus* é preciso fortalecer a Atenção Primária à Saúde a fim de melhorar a assistência e, assim, o rastreamento e tratamento.

DESCRITORES: Perfil de saúde; Hospitalização; Mortalidade; Diabetes *mellitus*.

RESUMEN

Objetivo: analizar el perfil de hospitalizaciones y mortalidad por Diabetes Mellitus en Piauí entre 2015 y 2019. **Método:** estudio transversal, descriptivo y cuantitativo, realizado con datos secundarios de los años 2015 a 2019, extraídos del sitio web del Departamento. de Informática del Sistema Único de Salud La población de estudio estuvo constituida por todas las hospitalizaciones y defunciones por Diabetes Mellitus de personas residentes en el Estado de Piauí. **Resultados:** se registraron 18.361 hospitalizaciones por Diabetes Mellitus, de las cuales 527 fallecieron, con una tasa de mortalidad de 2,87 por 100 hospitalizaciones. Las hospitalizaciones predominaron en mujeres, morenos y con edades comprendidas entre los 60 y los 69 años. Las muertes fueron predominantes entre mujeres, marrones y ancianas. **Conclusión:** para reducir la morbimortalidad por Diabetes Mellitus es necesario fortalecer la Atención Primaria de Salud para mejorar la atención y, por ende, el cribado y el tratamiento.

DESCRIPTORES: Perfil de salud; Hospitalización; Mortalidad; Diabetes mellitus.

INTRODUCTION

The prevalence of Diabetes Mellitus (DM) has been steadily increasing everywhere in the world, especially in developing countries. Currently, about 422 million people around the world are carriers of DM, a pathology that is a major cause of morbidity and mortality and a relevant public health problem. It is also believed that approximately 50% of affected people are unaware that they have the disease, which interferes in the beginning of treatment and prevention of associated morbidity and mortality.[1]

In a data survey conducted in 2000, it was recorded that about 150 million people live with DM. Data from 2015 reveal that the total number of people with the disease exceeds the mark of 415 million, setting a prevalence of 8.8%. It is estimated that in Brazil there are 14.3 million people with DM, placing the country in fourth place in the group of countries with higher prevalence of the disease, behind China, India and the United States.[1-2]

The causal factors of DM are of genetic, biological and environmental origin. Although there is not enough knowledge of all the factors directly linked to the disease, the main ones observed in studies participate in the genesis besides being responsible for the growth of incidence in the world. Some of the factors are population aging, the growing prevalence of obesity and sedentarism, besides the urbanization processes.[3]

Although DM and its chronic complications are conditions that require preferential treatment in terms of Primary Health Care (PHC), acute cases of the disease require more complex care, being necessary a hospital care.[4] The chronic complications of DM trigger losses to the functional capacity of the carrier and loss of autonomy. This reflects in socioeconomic problems, generating a bureaucratic increase and inequities in health, thus causing a compromise in the quality of life (QL) of people with the disease.[2]

In addition to configuring a serious public health problem, financial expenses related to the DM are high for individuals and health systems. On a global scale, government expenditures range from 2.5% to 15%, depending on the location and prevalence rate, which will reflect on the complexity and available treatment.[5] However, in addition to financial expenditures, DM entails costs related to pain, anxiety and a lower QL, reflecting the general condition of patients and their families. This generates an additional burden to society, as it reflects on work environments, early retirement and premature mortality.[3] Research shows that the numbers of hospitalizations due to diabetes have higher expenditures compared to hospitalizations for adverse causes.[6]

Thus, a study on hospitalizations and the number of deaths due to DM will provide support to assess the quality of care offered in PHC, with emphasis on the effectiveness of the actions and the profile of hospitalized individuals.[7] Although there are studies on hospitalizations and mortality due to DM in some Brazilian states, to date there are no publications with information regarding the State of Piauí. Moreover, it is necessary to emphasize the need for this study, which will serve as a subsidy for health actions aimed at controlling morbidity and mortality related to DM.

As a guiding question, we ask: what is the profile of hospitalizations and mortality due to DM in the State of Piauí? This study aims to analyze the profile of hospitalizations and mortality due to Diabetes Mellitus in Piauí between 2015 and 2019.

METHOD

This is a cross-sectional study, of a descriptive nature and quantitative approach, which makes use of secondary data on hospitalizations and mortality by DM in Piauí, between the years 2015 and 2019.

The study population was all hospitalizations and deaths by DM of people living in the State of Piauí during the period investigated. The study site, in turn, was the State of Piauí, which is located in the Northeast region of Brazil, has an estimated population of 3,281,480 inhabitants for the year 2020 and a Human Development Index of 0.646, according to the 2010 Census.

The data referring to the study were extracted from the Sistema de Informações Hospitalares do SUS (SIH-SUS) and the Sistema de Informações sobre Mortalidade do Ministério da Saúde (SIM--MS), which are available free of charge at the e-mail address of the Departamento de Informática do Sistema Único de Saúde (DATASUS). The data were extracted in September 2020 and then grouped in a spreadsheet and descriptive statistical analysis (relative and absolute frequencies) was performed. Regarding the mortality rate, it was calculated through the ratio between deaths and hospitalizations, and the result was multiplied by 100.

It is important to emphasize that this study makes use of secondary data, openly available on the DATASUS site, which do not allow the identification of individuals and, therefore, there is no need for appreciation by the Research Ethics Committee. However, it should be noted that all the ethical precepts of the pertinent legislations have been respected.

RESULTS

In the period analyzed 18,361 hospitalizations for Diabetes Mellitus were recorded in Piauí, of which 527 evolved to death, with a mortality rate of 2.87 per 100 hospitalizations from 2015 to 2019. In addition, there was a reduction in the number of hospitalizations and deaths over the years. In relation to the mortality rate per 100 hospitalizations, despite the decline we observe fluctuations in the analyzed period, Table 1.

Table 2 shows that the majority of hospitalizations occurred among female and brown race individuals. Regarding age, 89.31% of the individuals were 40 years of age or older, with a higher prevalence in the 60 to 69 age group (24.50%). As for the attendance character, the urgency predominated (98.82%).

It is verified that the deaths predominated in female, brown race, elderly (60 years or more) and that they were treated in an urgent way, Table 3.

DISCUSSION

In this study it was found that there was a reduction in hospitalizations, deaths and mortality rates between the years 2015 and 2019. In relation to the mortality rate, despite the drop it was possible to notice oscillations during the studied period, presenting a lower percentage in 2015 (3.21%). Like this study, one conducted in Paraná, which analyzed the coefficient of admissions and the relationship with the expansion of the Estratégia Saúde da Família (ESF) during the years 2005 to 2015, showed a decrease in admissions per DM and related this to the increase in ESF coverage and eventual improvement in access to health services.[8]

High rates of hospitalizations may be related to low access to health services as well as low quality service offerings.[7] A study conducted in Pará showed that regions with difficult access to services and low social indicators had the highest rates of hospitalizations per DM.[9]

Females predominated among hospitalizations for Diabetes Mellitus in Piauí during the years 2015 to 2019. This finding corroborates with studies conducted in Bahia, Pará, Rio de Janeiro, Ceará and Paraná,[2,9-12] in which it was also observed predominance of women in hospitalizations for DM. A study conducted in Portugal on the impact of DM on multiple avoidable admissions found that women are more likely to have multiple admissions.[13]

Although the findings of this study point to greater hospitalization among women, the disease has been more prevalent in males, due to habits and lifestyles such as sedentariness, obesity, no consumption of fruits and/or vegetables, smoking, stress, and family history, according to a study conducted in Basic Health Units in Northeastern Brazil.[14]

The elderly were more prevalent among individuals who were hospitalized for DM (61.15%), especially in the 60 to 69 age group (24.5%). The predominance of hospitalizations in individuals aged 60 to 69 years was also recorded in other Brazilian studies.[9,12] A greater tendency of hospitalizations at more advanced ages is observed when comparing hospitalizations for DM according to age group,[12] and this may be related to demographic aging and the prevalence of risk factors for the development of DM, as well as to complications of DM, which imply a high number of hospitalizations.[11,15]

With regard to race, it was evidenced that the self-declared brown people were the most hospitalized by DM in the period investigated, in line with studies carried out in Bahia and Pará.[2,9] Thus, it is considered relevant the monitoring of the most affected groups so that health actions can be formulated with the

Table 1 – Hospitalizations, deaths and mortality rate due to Diabetes Mellitus in Piauí, per year. Teresina, Piauí, Brazil, 2019.

Variables	2015	2016	2017	2018	2019	Total
Hospitalizations	4.299	3.875	3.486	3.450	3.251	18.361
Deaths	138	111	102	82	94	527
Mortality rate (per 100 hospitalizations)	3,21	2,86	2,93	2,38	2,89	2,87

Source:Ministry of Health- SUS Hospital Information System (SIH/SUS.

Table 2 – Internments by Diabetes Mellitus according to sex, race, age group and character of care in Piauí. Teresina, Piauí, Brazil, 2019.

Variables	2015		2016		2017		2018		2019		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Sex												
Male	1.746	40,61	1.672	43,15	1.491	42,77	1.475	42,75	1.476	45,40	7.860	42,81
Female	2.553	59,39	2.203	56,85	1.995	57,23	1.975	57,25	1.775	54,60	10.501	57,19
Breed												
White	141	3,28	157	4,05	154	4,42	171	4,96	167	5,14	790	4,30
Black	64	1,49	90	2,32	89	2,55	76	2,20	87	2,68	406	2,21
Brown	2.075	48,27	1.724	44,49	1.626	46,64	1.764	51,13	1.659	51,03	8848	48,19
Yellow	137	3,19	310	8,00	312	8,95	334	9,68	299	9,20	1392	7,58
Indigenous	-	-	-	-	-	-	1	0,03	-	-	1	0,01
Ignored	1.882	43,78	1.594	41,14	1.305	37,44	1.104	32,00	1.039	31,96	6924	37,71
Age group												
Less than 1 year	7	0,16	6	0,15	7	0,20	2	0,06	5	0,15	27	0,15
1 to 4 years	15	0,35	18	0,46	9	0,26	10	0,29	13	0,40	65	0,35
5 to 9 years	25	0,58	24	0,62	17	0,49	28	0,81	16	0,49	110	0,60
10 to 19 years	89	2,07	102	2,63	72	2,07	68	1,97	77	2,37	408	2,22
20 to 29 years	100	2,33	92	2,37	90	2,58	78	2,26	90	2,77	450	2,45
30 to 39 years	203	4,72	219	5,65	159	4,56	174	5,04	147	4,52	902	4,91
40 to 49 years	443	10,30	411	10,61	350	10,04	374	10,84	347	10,67	1.925	10,48
50 to 59 years	776	18,05	679	17,52	616	17,67	619	17,94	556	17,10	3.246	17,68
60 to 69 years	1.087	25,28	958	24,72	879	25,22	763	22,12	811	24,95	4.498	24,50
70 to 79 years	1.000	23,26	806	20,80	762	21,86	802	23,25	703	21,62	4.073	22,18
80 years or more	554	12,89	560	14,45	525	15,06	532	15,42	486	14,95	2657	14,47
Character of attendance												
Elective	44	1,02	35	0,90	41	1,18	59	1,71	37	1,14	216	1,18
Emergency	4.255	98,98	3.840	99,10	3.445	98,82	3.391	98,29	3.214	98,86	18.145	98,82

Source: Ministry of Health – SUS Hospital Information System (SIH/SUS).

purpose of reducing, above all, complications and, consequently, hospitalizations by DM.[9]

This study evidenced a greater number of hospitalizations performed on an emergency basis, a fact that corroborates another study conducted in Rio de Janeiro in 2014, in which emergency hospital admissions corresponded to 93% of the cases of hospitalizations for DM.[10] This can be explained by the greater risk that age groups of elderly and young people have to be admitted for this type of hospitalization, having as main cause the acute complications and in lower prevalence acute chronic complications.[10]

In relation to deaths, a discrete prevalence among women was observed, a finding that corroborates studies conducted in other contexts, in which 55.1% and 54% of deaths due to DM occurred in female individuals.[16-17] An international study points out some contributing factors to a less favorable condition of diabetic women, such as reproductive factors, differences between symptoms and psychosocial stress.18 In addition, an Italian study showed that the general cardiovascular risk is higher in diabetic women who are older and obese and have had DM for longer, in general, have worse glycemic control and lipid profile in relation to men, although they undergo a similar or more intense pharmacological treatment.[19]

It is also believed that the highest mortality in females is due to inadequate DM control at all ages from middle age onwards and it is suggested that this may occur because women often have to deal with DM and family care, which demands a lot from them and therefore they may postpone seeking assistance in health services.[20]

It has been shown in this study that the majority of deaths occurred in the elderly, especially those aged 80 and over. This result is in agreement with research conducted in Ribeirão Preto-SP, in which mortality was higher among elderly people over 80 years of age (33.3%).[16] The growth in mortality rates by DM at older ages may result from the frailties of the systems and physiological organs, common to the aging process, as well as from the comorbidities that arise over time, added to unsatisfactory self-care.[21] Thus, it is understood that DM is a significant contributor to increased risk of death and reduced life expectancy in the older population.

Table 3 – Deaths by Diabetes Mellitus according to sex, race, age group and character of care in Piauí. Teresina, Piauí, Brazil, 2019.

Variables	2015		2016		2017		2018		2019		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Sex												
Male	61	44,20	53	47,75	48	47,06	33	40,24	42	44,68	237	44,97
Female	77	55,80	58	52,25	54	52,94	49	59,76	52	55,32	290	55,03
Breed												
White	2	1,45	1	0,90	2	1,96	4	4,88	0	0,00	9	1,71
Black	1	0,72	1	0,90	2	1,96	0	0,00	2	2,13	6	1,14
Brown	48	34,78	42	37,84	42	41,18	46	56,10	43	45,74	221	41,94
Yellow	1	0,72	1	0,90	4	3,92	9	10,98	8	8,51	23	4,36
Ignored	86	62,32	66	59,46	52	50,98	23	28,05	41	43,62	268	50,85
Age group												
10 to 19 years	-	-	1	0,90	1	0,98	1	1,22	2	2,13	5	0,95
20 to 29 years	3	2,17	5	4,50	2	1,96	1	1,22	1	1,06	12	2,28
30 to 39 years	5	3,62	9	8,11	2	1,96	3	3,66	3	3,19	22	4,17
40 to 49 years	8	5,80	7	6,31	6	5,88	7	8,54	7	7,45	35	6,64
50 to 59 years	13	9,42	10	9,01	11	10,78	9	10,98	13	13,83	56	10,63
60 to 69 years	32	23,19	25	22,52	21	20,59	10	12,20	16	17,02	104	19,73
70 to 79 years	34	24,64	18	16,22	30	29,41	25	30,49	24	25,53	131	24,86
80 years or more	43	31,16	36	32,43	29	28,43	26	31,71	28	29,79	162	30,74
Character of attendance												
Elective	-	-	-	-	1	0,98	-	-	-	-	1	0,19
Emergency	138	100,00	111	100,00	101	99,02	82	100,00	94	100,00	526	99,81

Source: Ministry of Health – SUS Hospital Information System (SIH/SUS).

In this study, deaths of individuals who were admitted as emergencies, as well as in a study conducted in Bahia, predominated.[1] This scenario can be justified due to lack of adequate and resolutive attention to health problems, obstacle in access to health services or low attachment, spontaneous search for specialized or emergency services, characteristic of individuals who only seek assistance when they are in a more advanced stage of the disease, although promotion, prevention and treatment of DM can be effective in PHC.[22]

It should be noted that the study has limitations regarding the unavailability of some information provided by the Sistema de Informações Hospitalares (SIH-SUS) about the characteristics of patients and hospitalizations.

CONCLUSION

A decrease in the number of hospitalizations and deaths per DM, as well as in the mortality rate, per 100 hospitalizations, was observed during the period investigated. The findings of this study may direct health actions, especially those aimed at health promotion, with the purpose of opportunizing the achievement of healthy habits and, consequently, reduction of risk factors. In addition, the importance of providing, also in the hospital context, care that encourage glycemic control, adherence to drugs and, also, change habits is highlighted. However, it is important to emphasize that to minimize morbidity and mortality due to DM, it is necessary to strengthen Primary Health Care in order to improve assistance and, consequently, to improve the tracking and treatment of the population with DM.

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