Scientific Electronic Archives
Issue ID: Sci. Elec. Arch. Vol. 12 (5)
October 2019
DOI: http://dx.doi.org/10.36560/1252019889
Article link
http://www.seasinop.com.br/revista/index.php?journal=SEA&page=article&op=view&path%5B%5D=889&path%5B%5D=pdf
Included in DOAJ, AGRIS, Latindex, Journal TOCs, CORE, Discoursio Open Science, Science Gate, GFAR, CIARDRING, Academic Journals Database and NTHRYS Technologies, Portal de Periódicos CAPES.
ISSN 2316-9281

Diabetics: Epidemiological profile and knowledge about the complications of diabetes mellitus

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Abstract. The aim of this study was to describe the epidemiological profile and the patients knowledge about Diabetes Mellitus (DM). About sixty-six patients answered a questionnaire like an interview. The predominantly females (60,6%), aged 61 years or over (68,2%), primary school (59%), white color (78,8%), non smokers (97%), retired people (77,4%), married (66,7%), low income (50%), over weight (35%), inactivity or don´t practice physical activity (60,6%), diabetes family history (79,4%), and hypertension as principal comorbidity (25,6%). In the relation to pathology`s knowledge, about 60,6% of people figure out of what is this pathology and the proper care. Of the participants, 72,5% said it was "sugar in the blood" and 86,4% related that having Diabetes Mellitus (DM) type 2. The most part of patients (78,8%) didn´t had signs and symptoms when they had diagnosed with the disease. Almost 88% of patients used oral antidiabetic treatment, and the most common medicine is metformin, used by which 86,4% of the patients. There are patients who use insulin, 87,5% use 10 to 40 IU, twice a day 63,5%, they have to inject the insulin in the abdomen and 50% have to do the self-application. Now, in relation to diet, 72,7% said they follow her adequately and 62,2% don´t have problems with this. The results also showed that patients are aware of the possible complications, and the most frequent was retinopathy, 95,4%. Then, 68,2% use dental prostheses, and 62,1% don´t search for dental care. In this way, it is possible to concluded that diabetics patients should receive individualized and multidisciplinary care in the Basic Health Units, so that together with the professionals that monitored them, then can define what kind of care is required, and also decide to follow the treatment in a correct way, delaying the complications and improving their quality of life.
Keywords: Diabetes Mellitus. Health Profile. Knowledge. Therapeutics. Primary Health Care.

Introduction

Chronic disease known as Diabetes Mellitus (DM) is characterized by increased blood glucose over a long period of time. Such elevation may occur due to a deficiency in action or complete lack of insulin production by the pancreatic beta cells, which fail to properly respond to their function. Symptoms such as polyphagia, polydipsia, polyuria and weight loss can be verified (Sociedade Brasileira de Endocrinologia e Metabologia, 2016).

In Brazil, diabetes affects 6.2% of the adult population, about 9 million, of which 5.4 million are women and 3.6 are men. People over 65 are most affected, representing a total of 39.5%. (BRASIL, 2015).

In Santa Catarina, this disease was the cause of death of 14,303 people, causing a total of 44,081 hospitalizations in the last ten years (GOVERNO DE SANTA CATARINA, 2015). In 2015, there were 84,848 registered as carriers of this pathology in Santa Catarina, and only 61,335 were followed (BRASIL, 2015).

Água Doce, a municipality located in the microregion of the Midwest Santa Catarina, with 7143 inhabitants had 193 diabetic patients, data collected at the Health Unit of the Municipality (Prefeitura Municipial de Água Doce, 2017).

This is considered to be one of the most prevalent diseases in the world, with an increase from 30 million carriers in 1985 to 135 million in 1995, reaching 173 million adults in 2002, and the estimate for the year 2030 is that we have 300 million adults with DM. This increasing incidence is mainly due to poor diet, obesity and sedentary lifestyle (Sociedade Brasileira de Diabetes, 2014).

Patients with DM need multidisciplinary follow-up in order to provide proper care, as well as how to respond to situations of hypoglycemia and hyperglycemia, overcome daily difficulties, accept the disease, educate themselves in the diet, use the medication correctly, monitor blood glucose and be

aware of other comorbidities that may be associated with the disease (OLIVEIRA, ZANETTI, 2011). The guidance given to patients should be based on nursing diagnoses raised during the consultation, seeking individualized solutions so that the problems raised are effectively addressed.

Given the above and based on the importance of proper diagnosis and treatment of DM, this study was guided by the following question: What was the profile of diabetic residents in the municipality of Água Doce - SC, and what knowledge did they have about their disease?

Thus, the aim of this study was to characterize the epidemiological profile and knowledge of patients with DM in the municipality of Água Doce - SC.

Methods

This is an exploratory study of quantitative character performed with diabetic patients from Água Doce - SC.

Currently the city has three Family Health Strategy teams, having 193 diabetic patients enrolled, however the research was conducted in one of the FHS Units, called ESF Sr. Thereza Uber, which had 79 diabetics registered. The sample size calculation was made according to Santos (2017), considering a 5% sampling error and a 95% confidence level. Thus, 66 diabetics were sampled.

Data were collected through a questionnaire that was applied by the researcher as an interview at the patients' residence after previous appointment. The patients were randomly drawn and were invited to participate in the research and signed the Informed Consent Form. The inclusion criteria included: a) being enrolled in the ESF Irmã Thereza Uber; b) have diabetes mellitus with a confirmed medical diagnosis; c) over 18 years old; d) of both sexes.

To characterize the socio-demographic profile, variables such as gender, profession, marital status, race, education, religion, which type of DM, behavioral habits and medications used were chosen. (SILVA, 2016; CORTEZ, 2014; SILVA, 2015)

Body Mass Index was calculated according to the formula:

$$BMI = \frac{\text{weight (Kg)}}{\text{height}^2\ \text{(m)}}$$

The measurement was performed by a calibrated scale, available in the unit and after the patient emptied the bladder. Patients were weighed barefoot wearing as little clothing as possible. (ABRAN, 2016).

Weight and height measurements followed the norms of the Brazilian Nutrology Association (2016): The patient stood upright, arms outstretched, head up, staring at a fixed point. He was instructed to keep his heels, knees and feet together.

The patients were argued about the disease and its complications.

Data were tabulated in Excel 2010 and analyzed using descriptive statistics. The variables were expressed as absolute numbers, mean standard deviations and percentages, according to the presentation form.

Ethical aspects

For this research, authorization was requested from the Municipal Health Secretariat. This study followed the ethical precepts recommended by Resolution No. 466/2012. Being presented to the UNOESC Research Ethics Committee with CAAE: 66358217.7.0000.5367 and approved under opinion 2.031.788.

A copy of the final report of this study was sent to the Municipal Health Secretariat of the municipality of Água Doce - SC, as well as a copy was in the collection of the UNOESC Library.

Results and discussion

The data collection results were expressed in table 1.

Similar data were also found in the study conducted in Minas Gerais in 2014, with the objective of associating the duration of the disease with the onset of chronic complications of diabetes mellitus. 61.4% of the patients were women (CORTEZ, et al., 2015). Ferreira and Ferreira (2009) reported that the prevalence of diabetes differed in relation to gender. It was also noticed that women sought health services more often, taking care of themselves and getting an earlier diagnosis than men.

In a study conducted in Brazil in 2013 by the Brazilian Institute of Geography and Statistics Foundation (IBGE) in partnership with the Ministry of Health (MS) and the Oswaldo Cruz Institute Foundation (Fiocruz), 5.5% of the carriers were brown, 7.0% were Caucasian and 7.0% were black. (ISER, et al., 2013).

A survey conducted in the Family Health Strategies of Tabira in Pernambuco in 2013, which aimed to assess patients' profile and perception of diabetes and periodontal disease, showed that the mean age was 62.7 ± 14.9 years. . This result, along with ours, suggests an increase in the presence of chronic diseases according to age (SOUSA et al, 2014).

The Brazilian Society of Diabetes (2016) reported that the prevalence of 2.7% in people with DM between 30 and 59 years, while those over 61 years represented 17.4%, corroborating the findings of the present study.

In 2013, a study by the Brazilian Institute of Geography and Statistics Foundation showed that the diagnosis of DM was more frequently reported by less educated people, with 9.6% (approximately 5.5 million) without education or with incomplete primary education (ISER et al., 2015). Also the Brazilian Society of Diabetes (2016), says that the

lower the schooling the higher the cases of this disease. It also points out that there is a difficulty in raising awareness of this population in preventing this disease.

In Table 2, it was found that the most prominent was the retirees / pensioners and the income with the largest number of respondents was up to two minimum monthly wages. Both results corroborated with Boas et al. (2011), who observed in Ribeirão Preto - SP, that 41.4% of patients with type 2 DM were retired / pensioner and the average income reported was R $ 1,325.65 which represented 1.41 salaries.

Table 1 – Characterization of diabetic patients according to genre, age, education, color and religion - Água Doce - SC, 2017.

Genre		
Female	40	60,6%
Male	26	39,4%
Age		
36 to 40	2	3,0%
41 to 50	5	7,6%
51 to 60	15	22,7%
61 to 70	20	30,3%
>71 years	24	36,4%
Schooling		
1ª to 4ª	39	59,0%
5ª to 8ª	5	7,7%
Complete Elementary	2	3,0 %
High school	4	6,0%
College	12	18,3%
No studied	4	6,0%
Color / Race		
Caucasian	52	78,8%
Brown	12	18,2%
Black	2	3,0%

In a study to characterize DM users in a primary health care unit in Ribeirão Preto, it was found that 41.8% of respondents were housewives and 26.6% retired, with a monthly family income of 1 to 5 minimum wages (OLIVEIRA; ZANETTI, 2011). Another study conducted in São Paulo, showed 46.9% of patients in the condition of retirees and 41.5% had monthly family income less than or equal to 2 minimum wages (ZANCHETTA, et al, 2016). The contradiction of these data may be due to the fact that DM is a growing disease and its prevalence increased throughout the population.

Table 3 shows that 66.7% (n = 44) of the patients were married while the rest were single, widowed and others. There is no history that marital status and / or people sharing the same residence directly influence the incidence of the disease. However, Guimarães and Takayanagui (2002) pointed out that the mortality rate is higher among widowers, divorced and single due to the probable care assistance that the spouse can provide.

When asked what DM is, 39.4% (n = 26) said they did not know what this disease is, even if they had it. Of those who knew the disease, 72.5% (n = 29) reported "that DM is blood sugar". Only 1 patient could not inform the type of diabetes.

When considering the mentioned data, it is essential that the educational process of the disease is an integral part of clinical care. The lack of educational actions may compromise users' adherence to treatment (SILVA, et al, 2011).

The reasons why participants sought medical attention were polydipsia (19.7%), polyuria (7.6%), tiredness (9.0%), weight loss (7.6%), delayed healing (4, 5%), dry skin (3.0%), tingling in limbs (16.7%), blurred vision (18.2%), but 78.8% had no symptoms, and their diagnosis was confirmed by routine examination.

In a study conducted at the Clinic Hospital Endocrinology and Metabology Clinic between 2000 and 2001, 25% of patients with diabetes reported polydipsia, 16.9% of polyuria, 13.3% of visual problems, and 7, respectively. 2% had tiredness. Thus finding that the main complaint in both studies is polydipsia (PACE, et al., 2006). However, in the literature consulted, no higher or lower prevalence was found for classic DM symptoms, such as polyuria, polyphagia, polydipsia.

Only two patients were smokers, one consuming 10 to 12 cigarettes / day and the other, on average 18 cigarettes / day. Despite being a minority of smokers, the danger is highlighted, as smoking is related to more than 50 diseases that affect various systems in the body, including respiratory, cardiovascular, digestive and genitourinary. Smoking associated with systemic arterial hypertension and diabetes ends up aggravating the risk factors of cardiovascular disease (BARBOSA, 2008; Sociedade Brasileira de Pneumologia e Tisiologia, et al., 2010).

The diabetics in this study used 3 types of medication for their treatment, 88.0% (n = 58) using oral antidiabetic drugs, 11.0% (n = 7) oral antidiabetic drugs and insulin and 1.0% (n = 1) insulin only.

Table 2- Characterization of diabetic patients regarding occupation and financial situation– Água Doce - SC, 2017.

Profession		
Retired / Pensioner	51	77,4%
Pharmacy attendant	1	1,5%
Administrative Assistant	1	1,5%
Merchant	2	3,0%
Accountant	1	1,5%
Dentist	1	1,5%
Forwarding agent	1	1,5%
From home	3	4,6%
Employer	1	1,5%
Manicure	1	1,5%
Driver	2	3,0%
Bricklayer	1	1,5%
Income (minimum wage)		
1	5	7,6%
2	33	50,0%
3	16	24,4%
4	6	9,0%
>4	6	9,0%

Table 3 – Characterization of diabetic patients regarding marital status and family arrangement– Água Doce – SC, 2017.

Marital status		
Married	44	66,7%
Others	2	3,0%
Single	4	6,0%
Widower	16	24,3%
Family Arrangement		
Nuns	2	3,0%
Spouse	24	36,4%
Spouse and Family	22	33,4%
Relatives	12	18,2%
Single	6	9,0%

Table 4 - Characterization of diabetic patients on the knowledge of the pathology and what types of diabetes – Água Doce – SC, 2017.

What is this knowledge?		
Blood sugar	29	72,5%
Dangerous disease, poor diet	1	2,5%
Pancreas does not produce insulin	10	25,0%
What is your type of diabetes?		
Do not know	1	1,5%
Type 1	8	12,1%
Type 2	57	86,4%

In a study conducted by the University of São Paulo in 2008, it was found that the combination of insulin and oral antidiabetic drugs was the most frequent drug treatment (64.2%), those using only insulin were 21% and only oral antidiabetic drugs 14,8. % of participants (BOAS, 2014).

ZANCHETTA et. (2016) showed that 83.1% of the patients used oral antidiabetic drugs and 55.4% used insulin. Compared to other studies, the population studied has little insulin use, which may be due to the higher prevalence of type 2 DM or satisfactory glycemic control.

Table 5 showed the type of medication that was taken by the patient. It is emphasized that the same patient can associate two types of oral antidiabetic drugs. These data are not surprising since these drugs are the ones available in SUS.

In Porto Alegre, among the diabetic elderly, Metformin was the hypoglycemic drug that presented the highest frequency of use (76.5%) followed by Glibenclamide (40.8%) (SILVA, et al., 2016)

Diabetes is a chronic noncommunicable disease that, if left untreated, can lead to serious complications, such as kidney failure, so it is essential that patients follow recommended treatment and constant monitoring. In addition to following treatment it is important that patients seek to change their lifestyles, creating healthier habits to alleviate the symptoms that diabetes causes and

help the treatment to be more effective. (BRASIL, 2006).

The type of insulin used by 87.5% (n = 7) of patients is PHN and only 12.5% (n = 1) uses Regular. The number of daily applications varies from 1x daily with 12.5% (n = 1) and 2x daily 87.5% (n = 7), and 50% (n = 4) reported self-application, followed by 25% (n = 2) that the spouse applies. The most commonly used application site was the abdomen with 62.5% (n = 5).

Insulin users require a constant education, as teaching patients and family members is essential for correct application promoting proper absorption of the drug and continuous treatment. (SIMÕES, 2014). According to the Brazilian Society of Diabetes (2016), the recommended regions for insulin application are those that are away from joints, bones, large blood vessels, nerves, and should be easily accessible for self-application. A rotation scheme should be performed between regions and the patient should be guided to follow this scheme. The recommended regions are: arms, buttocks, thighs and abdomen.

Table 5. Characterization of diabetic patients regarding the medication used for disease control – Água Doce – SC, 2017.

Medications	**Rate (%)**
Sitagliptin phosphate 50 mg	6.0
Insulin NPH	10.6
Metformin	84.6
Regular insulin	1.5
Glyburide	31.8
Glimepiride	4.5
Diamicron MR 60 mg	1.5
Nesina	1.5

Table 6 showed the patients' eating habits. In addition to physical activity, following a diet and facing the difficulties of following it is essential, as about 40% of patients can control their metabolism by improving their lifestyle and following an appropriate diet. One of the main reasons why difficulties arise is the lack of motivation (GRILLO, GORINI, 2007).

Boas et al. (2011) reported that lifestyle changes pose a major difficulty for people, especially when it comes to following a diet and exercising.

The level of physical activity was expressed in Table 7. Studying the relationship between metabolic syndrome and users of basic health units with social and environmental profiles, Leitão & Martins (2012) observed that 42.3% of respondents were sedentary, 27.2% practiced some light physical activity and 25.5% practiced activities moderate.

For DM treatment to be effective, in addition to the correct medication, the patient must change lifestyle, including physical activity, to increase peripheral insulin sensitivity. Still, a calorie-restricted diet is desirable (Brazilian Society of Diabetes, 2016). On the other hand, it is common for people not to change their lifestyle and adhered to physical activity (CORTEZ, et al., 2015), according to data collected in this research.

In the present study, 95.4% stated that the biggest problem caused by diabetes is the eye, followed by 87.9% of circulatory problems, 84.8% of foot problems, 78.8% of kidney problems, 78.8 % strokes, 72.7% for heart problems and 100% believed that there are no other problems besides those mentioned.

Uncontrolled DM can cause long-term dysfunction and failure of various organs. Thus, DM is considered a cause of blindness, renal failure and limb amputations, neuropathies, and a substantial reduction in working capacity and life expectancy (BRASIL, 2013).

For CORTEZ et al. (2015), the longer the disease, the greater the possibility of complications. In DM, complications are aggravated in people who do not perform self-care activities, related to correct nutrition, physical activity and the appropriate use of medication when necessary.

In the present study, 33% had an overweight BMI (n = 22), 35% had an Obesity BMI (n = 23) and 32% had a normal BMI (n = 21). Thus, the rate of obese and overweight people was higher. prevalent. According to the Brazilian Association for the Study of Obesity and Metabolic Syndrome (2009), normal weight is classified as individuals with a BMI between 18.5 - 29.4 kg / m², as overweight BMI ≥ 25 kg / m² and obesity BMI. ≥ 30 kg / m².

Oliveira & Zanetti (2011) observed that 80% of users with type 2 DM were obese or overweight, which is one of the triggering factors of the disease. In Pelotas - RS, in 2008, Lima et al. (2011) reported that 46.7% of diabetics were overweight and 23.3% were obese. Staying in an optimal weight range decreases the risk of long-term comorbidities associated with DM.

The presence of the disease in the family was expressed in Table 8. In the present study 85.8% (n = 90) of the interviewees had some family member with this disease. Heredity contributes to the onset of type 2 DM, so it is important that all individuals maintain healthier lifestyles to delay the disease.

Table 6 – Characterization of diabetic patients regarding adherence and difficulty in following the diet – Água Doce – SC, 2017.

Does it diet?		
No	18	27,3%
Yes	48	72,7%
What don't you eat anymore?		
Sugar	1	4,3%
Carbohydrate	2	8,7%
Starch	1	4,3%
Lipids	15	65,2%
Soda	1	4,3%
Salt	3	13,0%
Reason for difficulty following diet		
Anxiety	4	7,8%
Nervousness	1	2,0%
Control will	13	25,5%
Sadness	1	2,0%
No reason	32	62,7%

Table 7 – Characterization of diabetic patients regarding physical exercise – Água Doce – SC, 2017

Physical Activity Practice		
Gym	1	1,5%
Walking	18	27,3%
Walking, gym	2	3,0%
Walking, Physiotherapy, Step	1	1,5%
Dance	1	1,5%
Treadmill	2	3,0%
Soccer	1	1,5%
No exercise	40	60,6%
How many times a week?		
Once	2	3,0%
Twice	3	4,6%
3 times	14	21,2%
4 times	1	1,5%
6 times	2	3,0%
7 times	4	6,1%
Not practical	40	60,6%
Time spent on physical exercise		
120 min	1	1,5%
30 min	8	12,1%
40 min	5	7,6%
45 min	2	3,0%
60 min	10	15,2%
Not practical	40	60,6%

Medeiros et al. (2016) correlated glycated hemoglobin (HbA1c) values with lifestyle and possible chronic complications resulting from glycemic loss in patients diagnosed with type II DM. The authors reported that 79.4% of respondents had a family history of diabetes. First-degree relatives of people with type 2 DM are two to six times more likely to develop diabetes compared with people with no family history.

Table 9 shows that the most reported comorbidities by patients in the present study were hypertension, cholesterol and heart problems. In a cross-sectional study, Faria et al. (2013) observed that the main comorbidities were hypertension (81.3%) and dyslipidemia (32.4%) and the chronic complications were retinopathy (37.8%) and heart disease (20.3%). which corroborates our results.

The risk of diabetes is estimated to be three times higher in hypertensive individuals, and the risk of cardiovascular complications increases. There is also an association between diabetes and chronic kidney disease, as a greater predisposition of the diabetic to develop some nephropathy (FRANCISCO, et al, 2010).

Regarding the use of dental prosthesis, 68.2% of respondents used it for the absence of all teeth. Periodic dental consultations are recommended, but only 37.9% (n = 25) went to the dentist regularly. Diabetes may favor the onset, severity, and progression of periodontal disease, and periodontal disease may induce a chronic state

of insulin resistance, contributing to hyperglycemia (SOUSA et al., 2014). Sousa et al. (2014) related diabetes and periodontal disease and it was observed that 73.2% had no teeth above 12 teeth, and 79.1% did not floss, which may suggest a poor follow-up by oral health team about the importance of oral hygiene habits or directly related to the advancement of periodontal disease. The dental condition profile of the interviewees were expressed in Table 10.

Table 8 – Characterization of diabetic patients in relation to family history of pathology– Água Doce – SC, 2017

Family history		
Mother	27	25,7%
Father	15	14,3%
Brothers	28	26,7%
Grandparents	6	5,6%
Uncles	11	10,5%
Others	3	2,9%
No	15	14,3%

Table 9 – Characterization of diabetic patients regarding self-reported comorbidities – Água Doce – SC, 2017

Diseases/Dysfunction		
Hypertension	21	25,6%
Cholesterol	15	18,3%
No other disease	13	15,9%
Heart	12	14,6%
Thyroid	4	4,9%
Triglycerides	3	3,7%
Bronchitis	2	2,4%
Labyrinthitis	2	2,4%
Parkinson	2	2,4%
Redicivating Polychondritis	1	1,2%
Steatosis	1	1,2%
Psoriasis	1	1,2%
Arthrosis	1	1,2%
Depression	1	1,2%
Osteoporosis	1	1,2%
Prostate	1	1,2%
Bowel Cancer	1	1,2%

Table 10– Characterization of diabetic patients regarding dental problems – Água Doce – SC, 2017

Do you use dental prosthesis?		
No	21	31,8%
Yes	45	68,2%
Porque usa?		
Missing teeth	45	68,2%
Not applicable	21	31,8%
Do you have all the teeth?		
No	13	19,7%
Not applicable	45	68,2%
Yes	8	12,1%
Does dental follow-up?		
No	41	62,1%
Yes	25	37,9%
If so, which ones?		
Gingivitis	1	1,5%
Implant	2	3,0%
Inflamation	1	1,5%
Prosthesis	8	12,1%
Routine	12	18,2%
Treatment	1	1,5%
Not applicable	41	62,1%

Conclusion

In the present study, most were women aged> 61 years, and most had education from 1st to 4th grade. There was a higher prevalence of married people, and the most prominent occupation was retired / pensioner. The most common type of DM was Type 2..

The most common symptoms were polydipsia, tingling in the limbs and blurred vision, but most of the diagnosis was made during a routine examination, without symptoms.

Regarding medication, most used oral antidiabetic drugs, with metformin and glyburide more frequent. Those who used insulin were a minority and half did not apply themselves, being executed by a family member. The preferred site for insulin application was the abdominal region, rotating in the region itself..

Of what DM is, most answered “blood sugar” and the most commonly reported complications were circulatory problems, followed by retinopathy, foot and kidney problems, stroke and heart problems..

The self-reported comorbidities of diabetic patients were hypertension, high cholesterol and heart problems..

Given the above, it was proved the importance of early diagnosis, knowledge and appropriate treatment, as well as strictly follow the guidelines of the health team, so that the diabetic has a good quality of life..

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