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Analyses of the pharmacotherapeutic profile and treatment costs of patients treated by the specialized component of pharmaceutical care in the city of Caririaçu, Ceará

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Abstract

Objectives: to analyze the pharmacotherapeutic profile and treatment costs of patients assisted by the Specialized Component of Pharmaceutical Assistance (CEAF) in a municipality in the state of Ceará. **Methods:** descriptive and exploratory study carried out in a small town located in the state of Ceará. Data were collected at the CEAF pharmacy, from January 2020 to January 2021, referring to patients registered in the service between June 2011 and June 2020. for all stages of the CEAF, in the National Pharmaceutical Assistance Management System (Horus), namely: registration, request, evaluation, authorization, dispensing and renewal. To determine the costs per treatment, the values described in the medication receipt forms provided by the State Department of Health were used. Data were tabulated in Microsoft Excel® and statistical analysis, of the descriptive type, was performed using the Statistical Package for Social Sciences®. **Results:** The sample consisted of 143 individuals, in which there was a predominance of female patients (86.0%; n=123) and aged > 50 years (78.3%; n=112). The most prevalent disease was idiopathic osteoporosis (61.7%; n=96), predominantly in women (68.1%; 91), especially in the 60 and 69 age group (61.7%; n=96). With regard to male users, the most prevalent disease was paranoid schizophrenia (48.1%; n=13). In all, 27 CEAF items were dispensed with, with emphasis on calcitriol 0.25mg; olanzapine, 5 and 10mg; atovastatin 10 and 20 mg; and quetiapine, 25, 100 and 200 mg. Most drugs belonged to CEAF group 1A (59.6%; n=16), whose financing and distribution to the states is the responsibility of the Ministry of Health. The clinical condition with the highest funding by the health system was paranoid schizophrenia, with investment of 21.2% (R$ 63,050.40) of the total in medication. **Conclusion:** Our findings made it possible to delineate the clinical profile and treatment costs of users assisted by CEAF. Integrating clinical, epidemiological and drug management knowledge is important to overcome adversities and adequately meet the health needs of the population.

Análises do perfil farmacoterapêutico e dos custos com tratamentos de pacientes atendidos pelo componente especializado da assistência farmacêutica no município de Caririaçu, Ceará

Resumo

Objetivos: analisar o perfil farmacoterapêutico e os custos com tratamentos de pacientes atendidos pelo Componente Especializado da Assistência Farmacêutica (CEAF) em município do estado do Ceará. **Métodos:** estudo descritivo e exploratório realizado em um município de pequeno porte situado no estado do Ceará. Os dados foram coletados na farmácia do CEAF, de janeiro de 2020 a janeiro de 2021, referentes aos pacientes cadastrados no serviço entre junho de 2011 a junho de 2020. Incluiu-se, no estudo, os usuários que eram residentes no município e que passaram por todas as etapas do CEAF, no Sistema Nacional de Gestão da Assistência Farmacêutica (Hórus), a saber: cadastro, solicitação, avaliação, autorização, dispensação e renovação. Para determinação dos custos por tratamento, utilizou-se os valores descritos nas guias de recebimento de medicamentos fornecidas pela Secretaria Estadual de Saúde. Os dados foram tabulados no *Microsoft Excel®* e a análise estatística, do tipo descritiva, foi realizada por meio do *Statistical Package for Social Sciences®*. **Resultados:** A amostra foi constituída de 143 indivíduos, no qual observou-se predominância de pacientes do sexo feminino (86,0%; n=123) e de faixa etária ≥ a 50 anos (78,3%; n=112). A doença mais prevalente foi a osteoporose idiopática (61,7%; n=96), preponderante nas mulheres (68,1%; 91), especialmente na faixa etária 60 e 69 anos (61,7%; n=96). Com relação aos usuários do sexo masculino, a doença mais prevalente foi esquizofrenia paranoide (48,1%; n=13). Ao todo foram dispensados 27 itens do CEAF, com destaque para o calcitriol 0,25mg; a olanzapina, de 5 e 10mg; a atovastatina de 10 e 20 mg; e a quetiapina, de 25, 100 e

200 mg. A maioria dos medicamentos pertencia ao grupo 1A do CEAF (59,6%; n=16), cujo financiamento e distribuição aos estados compete ao Ministério da Saúde. A condição clínica com maior financiamento pelo sistema de saúde foi a esquizofrenia paranoide, com investimento de 21,2% (R$ 63.050,40), no período de um ano, do total em medicamentos. **Conclusão:** Nossos achados viabilizaram o delineamento do perfil clínico e dos custos com tratamento de usuários atendidos pelo CEAF. Integralizar os conhecimentos clínicos, epidemiológicos e de gestão do medicamento é importante para superar as adversidades e atender, apropriadamente, as necessidades de saúde da população.

Palavras-chave: acesso aos serviços de saúde; assistência farmacêutica, custos de cuidados de saúde, doenças não transmissíveis, tratamento farmacológico.

Introduction

The effective implementation of Pharmaceutical Assistance (PhA) is pointed out as one of the challenges to consolidate the Unified Health System (*Sistema Único de Saúde*, SUS). One of the aspects that contributes to tackling this issue is directly related to the development of its management in the SUS, a prerequisite for guaranteeing access to medications and comprehensive therapeutic assistance[1].

The National Medications Policy (*Política Nacional de Medicamentos*, PNM) defines PhA as a "set of activities related to medications, targeted at supporting the health actions required by a given community". Instituted on October 30th, 1998, the PNM was the framework ensuring actions capable of contributing improvements in health care. It was through it that PhA was re-elaborated, with the aim of supporting the actions required by the population in terms of medications[2]. In this way, the Pharmaceutical Assistance Specialized Component (*Componente Especializado da Assistência Farmacêutica*, CEAF) is a strategy aimed at easing access to mediations to guarantee comprehensiveness of the treatments, based on lines of care expressed in Clinical Protocols and Therapeutic Guidelines (*Protocolos Clínicos e Diretrizes Terapêuticas*, PCDTs) published by the Ministry of Health (*Ministério da Saúde*, MS)[3].

The CEAF is a relevant public health strategy because it is the only way to access higher-priced medications, such as immunosuppressants used in post-transplant treatments, immunobiologicals for autoimmune diseases and drugs used in hemodialysis treatments[4]. In 2016, of the 18.6 billion reais invested in medications by the MS, 6.6 billions were devoted to funding the CEAF[5].

Despite the emphasis expressed in the Brazilian literature and among managers on the financial aspects of the CEAF, different challenges make up a complex context to be managed, aiming at full and universal access to medications[4,6]. One of these challenges is decentralization of the actions, based on which the states and municipalities started to assume direct responsibility for health care, including the PhA-related actions[7]. However, according to Sopelsa et al.[8], many CEAF expenses might have been avoided with comprehensive monitoring of the individuals, already in Primary Health Care. In addition to helping direct actions with an emphasis on pharmaceutical care and pharmacotherapy monitoring, identifying the most frequent diseases contemplated by the CEAF among users can support actions aimed at modifying the historical panorama of these diseases. Studies on the topic can contribute to more effective PhA scheduling, providing elements to decision-makers regarding ¡planning of actions and ¡supply of high-cost medications[8].

Therefore, there is an increasing need for advancing in the ability to know and integrate clinical, epidemiological and drug management knowledge to overcome adversities and adequately respond to the needs of the population[7]. In this context, the objective of this study was to analyze the pharmacotherapy profile and the costs in medications for patients treated by the CEAF in a municipality from the state of Ceará.

Methods

This is quantitative, descriptive and exploratory study conducted in Caririaçu/Ceará, a small-sized municipality from northeastern Brazil. The Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística*, IBGE) considers as small-sized municipalities those with up to 100,000 inhabitants[9].

The municipality participating in the research has an area of 634.2 km^2, an estimated population in the 2010 IBGE census of 26,393 inhabitants, a demographic density of 42.33 inhabitants/km^2, and an estimated population in 2021 of 27,008 inhabitants, and ranks 72nd in the state among the most populous municipalities. It had 20 health units, one of them a pharmacy that serves the CEAF[9-10].

The data were collected at the municipal CEAF pharmacy, after signature of the trustee's term and approval of the project by the Research Ethics Committee (*Comitê de Ética em Pesquisa*, CEP), based on the National Management System for Pharmaceutical Assistance Management (Horus) and the medication supply guides issued by the State Health Department (*Secretaria Estadual de Saúde*, SES). Data collection took place from January 2020 to January 2021, referring to the patients registered at the service between June 2011 and June 2020.

The inclusion criterion encompassed users who were residents of the municipality and had gone through all the CEAF stages at Horus, namely: registration, request, evaluation, authorization, dispensation and renewal. The subjects excluded from the study were those with incomplete data in the system, as well as those who were inactive or banned to receive medications. The Anatomical Chemical Therapeutic classification included in the National List of Essential and Strategic Medications (*Relação Nacional de Medicamentos Essenciais e Estratégicos*, RENAME) published in 2022 was used to specify the therapeutic characteristics of the medications analyzed[11].

The variables collected were the following: age (in years old), gender (male or female), diseases diagnosed (based on the International Classification of Diseases - ICD10), medications dispensed (based on the common Brazilian denomination) and treatment costs (estimated in reais). The treatment costs were estimated based on the values described in the guides of medications provided by the SES. In order to ensure personal confidentiality, all the patients included in the current study were represented by means of a numerical identification.

The data obtained were organized in the form of tables and graphs, being mostly expressed by means of frequency distribution in percentage values using *Microsoft Excel®* (version 2013) and the *Statistical Package for Social Sciences®* (version 21).

The ethical aspects were observed and the study was approved by the Research Ethics Committee (CEP) of *Faculdade de Juazeiro do Norte*, under opinion No. 1,057,050.

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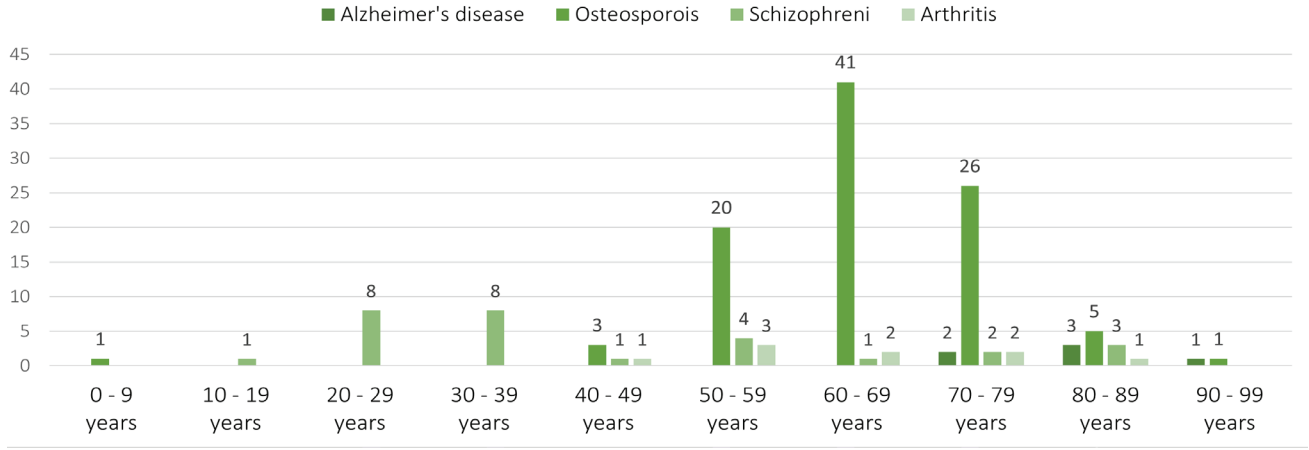
Results

After data analysis, 143 individuals met the inclusion criteria and were considered for the study. Predominance of the female gender (86.0%; n=123) was observed among them. Regarding the subjects' age, there was prevalence of individuals aged over 50 years old (78.3%; n=112). The percentage of aged people (at least 60 years old) active in the CEAF exceeded half of the users that received medications via this component (61.5%; n=86). The mean age among the women was 57±18.0 years old (variation: 0-99). In turn, the mean age found among the men was 77±7.9 years old (variation: 10-89).

With regard to the diseases that affected the subjects by age group, the diagnosis with the highest prevalence was idiopathic osteoporosis (61.7%; n=96), in the age group between 60 and 69 years old, followed by paranoid schizophrenia (14.7%; n=28), between 20 and 39 years old, and arthritis (6%, between 50 and 59 years old) (Figure 1). In turn, regarding gender, the disease that most affected women was idiopathic osteoporosis (71.6%; n=91), whereas the most frequent one in men was paranoid schizophrenia (48.1%; n=13) (Table 1).

As for the supply of medications, 27 items were dispensed, where calcitriol 0.25 mg, olanzapine 5 mg and 10 mg, atorvastatin 10 mg and 20 mg, and quetiapine 25 mg, 100 mg and 200 mg, all in coated tablet presentation, were the most dispensed. Thus, Table 2 below correlates the medications dispensed by the CEAF to the patients treated in the municipality, according to their Anatomical Therapeutic Classification and CEAF funding group.

Figure 1. Distribution of the population assisted, by age group and according to the main diagnoses. 2021.



Source: Research data (2021).

Table 1. Distribution of the population, by gender and according to the diagnoses. 2021.

Diseases	Men	Women	Total
	n (%)	n (%)	n (%)
Idiopathic osteoporosis	1 (3.7)	91 (68.1)	92 (57.5)
Paranoid schizophrenia	13 (48.1)	15 (11.3)	28 (17.5)
Early onset Alzheimer's disease	3 (11.1)	3 (2.3)	6 (3.8)
Seronegative rheumatoid arthritis	3 (11.1)	3 (2.3)	6 (3.8)
Other seropositive rheumatoid arthritis	1 (3.7)	4 (3.0)	5 (3.1)
Mixed hyperlipidemia	1 (3.7)	3 (2.3)	4 (2.5)
Rheumatoid arthritis with impairment of other organs and systems	0 (0.0)	3 (2.3)	3 (1.9)
Other hypophysis hyperfunctions	0 (0.0)	2 (1.5)	2 (1.3)
Ankylosing spondylitis	1 (3.7)	1 (0.8)	2 (1.3)
Post-menopausal osteoporosis	0 (0.0)	1 (0.8)	1 (0.6)
Disseminated [systemic] lupus erythematosus with involvement of other organs and systems	0 (0.0)	1 (1.1)	1 (0.6)
Hypopituitarism	1 (3.7)	0 (0.0)	1 (0.6)
Primary pulmonary hypertension	0 (0.0)	1 (0.8)	1 (0.6)
Hyperprolactinemia	0 (0.0)	1 (0.8)	1 (0.6)
Autoimmune hepatitis	0 (0.0)	1 (0.8)	1 (0.6)
Multiple sclerosis	0 (0.0)	1 (0.8)	1 (0.6)
End-stage renal disease	1 (3.7)	0 (0.0)	1 (0.6)
Parkinson's disease	1 (3.7)	0 (0.0)	1 (0.6)
Crohn's disease	1 (3.7)	0 (0.0)	1 (0.6)
Diabetes insipidus	0 (0.0)	1 (0.8)	1 (0.6)
Acne conglobata	0 (0.0)	1 (0.8)	1 (0.6)
Total	**27 (100.0)**	**133 (100.0)**	**160 (100.0)**

Source: Research data (2021).

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In addition, another characteristic analyzed was the financial impact exerted by the medications provided by CEAF in a one-year period, where it was possible to observe that the treatment for paranoid schizophrenia was the one that presented the highest annual cost, with an accumulated value of R$ 63,050.40, followed by treatments for other seropositive arthritis (R$ 52,959.36) and ankylosing spondylitis (R$ 51,514.08) (Table 3).

Table 2. Distribution of the medications for the diseases treatable by the Specialized Pharmaceutical Assistance Component in the municipality of Caririaçu/Ceará, according to the Anatomic Therapeutic Chemical classification and to the funding group. 2021.

Drugs	Anatomical therapeutic chemical classification	Funding group	n*
Calcitriol 0.25 mcg	Systemic hormonal preparations, excluding sex hormones and insulins	2	32,040
Atorvastatin 10 and 20 mg	Cardiovascular system	2	6,120
Olanzapine 10 and 5 mg	Nervous system	1A	5,760
Azathioprine 50 mg	Antineoplastic and immunomodulatory agents	2	3,600
Quetiapine 25, 100 and 200 mg	Nervous system	1A	3,240
Leflunomide 20 mg	Antineoplastic and immunomodulatory agents	1A	1,800
Donepezil 10 mg	Nervous system	1A	1,440
Raloxifene 60 mg	Genitourinary system and sex hormones	2	1,080
Risperidone 2 mg	Nervous system	1B	720
Amantadine 100 mg	Nervous system	1B	360
Isotretinoin 20 mg	Dermatological medicine	2	360
Mesalamine 400 mg	Digestive tract and metabolism	2	360
Rivastigmine 3 mg	Nervous system	1A	360
Ziprasidone 80 mg	Nervous system	1A	360
Methotrexate 2.5 mg	Antineoplastic and immunomodulatory agents	1A	240
Risedronate 35 mg	Musculoskeletal system	2	240
Etanercept 50 mg	Antineoplastic and immunomodulatory agents	1A	144
Sildenafil 20 mg	Cardiovascular system	1A	96
Adalimumab 40mg/mL	Antineoplastic and immunomodulatory agents	1A	72
Calcitonin 200 IU	Calcitonin preparations	2	60
Interferon beta 6,000.000 UI	Antineoplastic and immunomodulatory agents	1A	48
Cabergoline 0.5 mg	Genitourinary system and sex hormones	1A	48
Leuprorelin 3.75 mg	Antineoplastic and immunomodulatory agents	1B	24
Epoetin alfa 3,000 UI	Blood and hematopoietic organs	1A	12
Desmopressin 0.1 mg/mL	Systemic hormonal preparations, excluding sex hormones and insulins	1A	12
Infliximab 10 mg/mL	Antineoplastic and immunomodulatory agents	1A	12
Somatropin 4 UI	Systemic hormonal preparations, excluding sex hormones and insulins	1A	12

*pharmaceutical units. Acronyms: UI – International units; mg – milligrams; mcg – micrograms; mL – milliliter. Source: Survey data (2021).

Table 3. Survey of the annual treatment cost by diagnosis of the Specialized Pharmaceutical Assistance Component in the municipality of Caririaçu/Ceará. 2021.

Diagnosis	CID10	Annual financial impact (R$)
Paranoid schizophrenia	F20	63,050.40
Other seropositive rheumatoid arthritis	M05.8	52,959.36
Ankylosing spondylitis	M45	51,514.08
Seronegative rheumatoid arthritis	M06	50,727.60
Idiopathic osteoporosis	M81.5	29,347.92
Multiple sclerosis	G35	21,778.56
Rheumatoid arthritis with impairment of other organs and systems	M05.3	12,953.28
Hypopituitarism	E23	4,284.00
Other hypophysis hyperfunctions	E22.8	3,423.60
Hyperprolactinemia	E22.1	1,637.76
Early onset Alzheimer's disease	F00	1,386.00
End-stage renal disease	N18.0	1,026.24
Crohn's disease	K50.0	847.80
Post-menopausal osteoporosis	M81.0	541.92
Mixed hyperlipidemia	E78.2	410.40
Diabetes insipidus	E32.2	409.80
Parkinson's disease	G20	273.60
Acne conglobata	F70.1	226.80
Systemic lupus erythematosus with involvement of other organs and systems	M32.1	194.40
Autoimmune hepatitis	K75.4	194.40
Total	**-**	**297,187.92**

* pharmaceutical units. Source: Research data (2021).

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Additionally, it is worth noting that 14% (n=20) of the individuals studied were using at least two CEAF medications concomitantly, with olanzapine 10 mg and olanzapine 5 mg, followed by calcitriol and risedronate, as the most frequently dispensed in combination. The two most common diseases treated together were Alzheimer's disease and paranoid schizophrenia, with the respective medication for their treatments: donepezil 10 mg and quetiapine 10 mg and 200 mg.

Discussion

In the current research, the prevalence of chronic diseases, the pharmacotherapy profile and their respective financial impact on the population assisted by the CEAF living in a small-sized municipality from northeastern Brazil were described. The results of this study indicate that older adults affected by idiopathic osteoporosis, dyslipidemia and paranoid schizophrenia were the users most frequently treated in the CEAF from the municipality under study. Osteoporosis is the main chronic and progressive osteometabolic disorder that mainly affects individuals over 50 years of age, with a risk of developing bone fractures exceeding 40% in Caucasian women, which may imply morbidity and mortality and with significant public health expenditures[12-13]. These results are in contrast with the findings by Ribeiro, Banhato and Guedes[14], who investigated older adults' clinical and health service use profiles.

The current epidemiological scenario in Brazil proves to be compatible with the clinical profile of an increasingly older population. The infectious and contagious diseases that were among the main cause of death in mid-20th century now explain less than 10% of the deaths in the country[14].

In the meantime, the treatments for chronic diseases are generally prolonged and complex, which demands the use of more expensive technologies and implies the consumption of a significant percentage of the resources available for the health care to be provided to the population. For example, it is known that the health service use rate increases progressively from the age of 45 and quadruplicates from age 80 onwards. Consequently, the highest expenses related to health services in Brazil are devoted to the older age groups[15].

It should be noted that the CEAF is a strategy for access to medications within the scope of the SUS characterized by the search to guarantee comprehensiveness of drug treatments at an outpatient level, whose lines of care are defined in the PCDTs published by the Ministry of Health. However, in order to request medications, it is necessary to present a Specialized Component Medication Report (*Laudo de Medicamentos do Componente Especializado*, LME) and specific tests to be evaluated according to the PCDT inclusion and exclusion criteria[16].

In this sense, it was observed that the most dispensed medication was calcitriol, followed by atorvastatin, donepezil, olanzapin and quetiapine. This medication profile was partly found in the studies by Sopelsa et al.[8] and Ribeiro et al.[13]. A synthetic analogue of hormonally active Vitamin D, calcitriol was indicated by the Food and Drug Administration (FDA), the North American food and drug regulatory agency, to control hypocalcaemia in patients on chronic kidney dialysis, secondary hyperparathyroidism in patients with chronic kidney disease not yet on dialysis, and hypocalcaemia in patients with hypoparathyroidism and pseudohypoparathyroidism. The benefits of using a Vitamin D analogous in older adults with hypocalcaemia, mainly among aged women, is widely described in the literature[17-19].

The osteoporosis PCDT, where calcitriol is included, was approved by the MS through Joint Ordinance No. 451 of June 9th, 2014[20]. This PCDT included postmenopausal women and men aged at least 50 years old who had at least one of the following conditions: a) low-impact femur, hip or vertebra fractures (clinical or morphometric), radiologically proven ; b) densitometric examination with a T-score equal to or less than -2.5 in proximal femur or spine; and c) low bone mass (T score between -1.5 and -2.5 in proximal femur or spine) in patients aged at least 70 years old and with frequent falls (2 or more falls in the last 6 months). As special inclusion criteria for the treatment with calcitriol, patients with a plan to initiate and maintain treatment with glucocorticoids at a dose greater than 5 mg prednisone/day or equivalent for a period equal to or greater than 3 months had an indication for treatment[21].

With regard to atorvastatin, this medication belongs to the PCDT of dyslipidemia: prevention of cardiovascular events and pancreatitis[22], published in 2020 by the MS, from its approval through Joint Ordinance No. 8, of July 30th, 2019[23]. Atorvastatin acts in the inhibition of 3-hydroxy-3-methylglutaryl-CoA reductase, an enzyme involved in the synthesis of Low-Density Lipoproteins (LDLs). The following can be mentioned among the criteria listed for its prescription in the SUS: a) diabetes *mellitus* in men over 45 years of age and in women over 50 years old, with at least one major cardiovascular risk factor (smoking, systemic arterial hypertension, family history in a first-degree relative of early coronary artery disease – before age 55 for men and before 65 for women); b) moderate to high cardiovascular risk as defined by the Framingham Risk Score (FRS) with risk greater than 10% in 10 years; c) clinical evidence of atherosclerotic disease; d) definitive diagnosis of familial hyperlipidemia: whereas those were excluded from the PCDT were: a) people with decompensated hypothyroidism; b) pregnant women or women of childbearing age who are not using at least two safe contraceptive methods or who do not have definitive contraception; and c) severe acute or chronic liver disease (such as elevation of transaminases more than 3 times the normal values, jaundice or prolonged prothrombin time); or hypersensitivity or known prior adverse event to the drug or any component of the formula[22].

With regard to quetiapine and olanzapine, medications that are antagonists of dopaminergic D2 receptors, thereby inhibiting their activation by endogenous dopamine, they belong to the PCDT of schizophrenia, set of diseases to which paranoid schizophrenia (ICD10: F20.0) is related[24]. Chronic paranoid conditions manifest themselves in at least 6% of the aged population over 65 years old. A typical epidemiological characteristic is its pronounced differences between the genders in the older age groups. This is not seen in younger people, where the gender ratio is close to 1:1. The condition is more frequent in mid-age or at the end of old age, in a way that the mean onset age is from 40 to 49 years old for men and between 60 and 69 years old for women[25]. A study carried out in a municipality from the state of Santa Catarina, which reviewed the pharmacotherapy in a group of patients using the CEAF between January and March 2014, pointed to olanzapine as the most prescribed medication in the municipality[26].

As inclusion criteria for treatment with both drugs, specified in the schizophrenia PCDT, it is necessary that the patients meet the criteria for the diagnosis of schizoaffective disorder (ICD10: from F20.0 to F20.6 and F20.8) with adherence to outpatient

or hospitalization psychiatric care, when indicated. In the case of patients with severe functional impairments and autonomy loss that require treatment in a hospitalization regime, the recommendation is for a family member or legal guardian to be present. In situations of chronically isolated patients, the constant presence of a family member or employee from the institution available and capable of managing the environmental stressors is required. In turn, patients diagnosed with schizoaffective disorder who have intolerance, hypersensitivity or contraindication to the drugs, alcoholic or toxic psychosis, dependence or current abuse of psychoactive drugs and impossibility of adhering to the treatment or continuous monitoring were not included in the drug treatment. The PCDT also suggests that the patients excluded should participate in programs that motivate adherence and render them eligible to drug treatment[24].

Another aspect observed was the use of combined medications, such as olanzapin 5 mg and 10 mg coated tablets and risedronate and calcitriol. Associating the same medication with different doses is a common practice. This occurs, especially in the SUS, when the prescribed dose is not available for dispensing since, for reasons of rationality and standardization, it is not part of the list of medications[25]. Regarding the association between risedronate and calcitriol, an increase in bone mass can be observed in the patients more quickly than when both medications are used separately[27].

Referring to the funding group of the medications dispensed, it was observed that a vast majority belongs to Group 1A, whose funding and acquisition are in charge of the MS. Scheduling, storage and distribution are responsibility of the SES, whereas dispensing can be up to the pharmacies linked to the SES or to the Municipal Health Departments (*Secretarias Municipais de Saúde*, SMSs). Formerly, in Group 1B, the MS was only responsible for funding, with the other stages under responsibility of the SES, with the exception of dispensing, which remains a duty of the pharmacies linked to the SES or to the SMSs. Regarding Group 2, the only difference from Group 1B is that the funding responsibility lies on the SES[28]. In addition, with regard to Group 2, each state can agree on the list of medications it will make available, based on epidemiological criteria in the region, state protocols and the RENAME[11].

In this context, it is remarkable that most of the medications were funded and acquired by the MS. One of the reasons for this is related to the expansion of the list centrally acquired by the Ministry of Health. Two situations justify this increase. The first one is the agreement between SUS managers so that the federal government assumes the acquisition of medications already incorporated into the system[29]. The second situation is the incorporation of medications, which was increased with the institution of the National Commission for the Incorporation of Health Technologies (*Comissão Nacional de Incorporação de Tecnologias em Saúde*, CONITEC) in 2011 and which have already entered the SUS under the MS purchase responsibility[30]. A joint analysis of the data from the Outpatient Information System (*Sistema de Informações Ambulatoriais*, SIA) and the CEAF medication lists reveals that, between 2012 and 2018, the balance between incorporations and disincorporations in Group 1A was 17 drugs and that centralized acquisition in the MS was increased by 26 drugs (from 30 to 56)[31].

The disease that presented the highest treatment cost was paranoid schizophrenia, to the detriment of the number of patients and of the dosage schemes, which impacted on the final value of the treatment. On the other hand, chronic inflammatory autoimmune diseases, such as seropositive rheumatoid arthritis, ankylosing spondylitis, Crohn's disease, systemic lupus erythematosus, seronegative rheumatoid arthritis and autoimmune hepatitis, exert an important economic impact on the SUS, in view of the high added value of immunobiological medications. The treatment of these six autoimmune diseases in a one-year period was approximately R$ 156,437.64, which represented 52.6% of the total cost in the treatments provided by the CEAF at the municipality in question. Thus, it is expected that biosimilar medications, approved by the National Health Surveillance Agency (*Agência Nacional de Vigilância Sanitária*, ANVISA) since 2017, will generate market competition, thus reducing the final price of immunobiologicals for the public service[32].

Therefore, analyses on medication expenses are important both for public administration and for society, especially in countries that have not yet reached a high level of public supply of medications, as is the case in Brazil. In the country, out-of-pocket payment is still the main means to access these products[33-34], burdening proportionally more the budget of lower-income families[35]. However, despite the relevance of these analyses, they are limited to a more comprehensive understanding of the expenditures because they did not identify their drivers, which would help clarify whether variations in annual expenses are driven by changes in prices, quantities and/or for therapeutic choices[36].

In addition, although it was not the focus of this research, it is worth mentioning the pharmacists' role in the care of patients assisted by the CEAF since, among other contributions, this professional practice can collaborate to increasing adherence to treatments and self-care in chronic diseases, with a direct positive result in the patients' health conditions. The indirect results include expense reductions with a consequent and expected expansion in access to medications via the SUS[37].

One of the study limitations is related to the expenses per treatment, as the value of the last entry of a medication in the management system was considered, which may only reveal an approximate cost, considering the possibility of providing therapies to patients with heterogeneous costs at the data collection moment. However, this limitation does not render work unfeasible, as it is possible to estimate the annual expenses on the treatments provided by the CEAF pharmacy. It is also suggested, for a future study, to carry out comparisons between the quantities dispensed and the Defined Daily Dose of the medications, in order to verify whether the numbers dispensed to the users match the ones usually employed.

Conclusion

The results achieved allowed identifying the pharmacotherapy profile of the citizens assisted by the CEAF, in addition to knowing the characteristics and problems that affect them. On the other hand, with regard to the costs of the drug treatments provided by the specialized pharmacy, it was verified that the Ministry of Health is the main funder of the medications contemplated in components 1A and 1B of PhA, in which only Group 2, medications that normally have a lower cost than those allocated in the other groups, is under the states' funding responsibility. This analysis proves to be useful for PhA management, as it produces diverse information that enables a broader understanding of aspects inherent the population served and to the funding, acquisition and distribution of CEAF medications to the municipality, which can guide the adoption of measures aimed at improvements and continuity in the population's access to medications and rational use of the financial resources.

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Collaborators

KDMB participated in the following stages: choice of the topic, elaboration of the research, and data survey. FAPF: data interpretation and writing of the article. MMFF: collaboration in statistics, interpretation of the results, writing of the article, and relevant critical review of the intellectual content.

Declaration of conflicts of interest

The authors declare that there are no conflicts of interests in relation to this article.

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