

**The importance of pharmacotherapeutic follow-up in patients with heart failure**  
**A importância do acompanhamento farmacoterapêutico em pacientes com insuficiência**  
**cardíaca**

**La importancia del seguimiento farmacoterapéutico en pacientes con insuficiencia**  
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**Abstract**

Heart failure is a chronic disease that compromises the patient's quality of life, due to its symptoms, such as: tiredness/fatigue, exercise intolerance, orthopnea, paroxysmal nocturnal dyspnea. The aim of the present study was to intervene and assist in the treatment of Heart Failure patient with pharmacological and non-pharmacological approaches in order to improve the quality of life and patient compliance regarding the existing disease. Pharmaceutical consultations were carried out over a seven-month period with a patient that suffers from Heart Failure, resident of Umuarama-PR, treated at home. The SOAP method was adopted for the registration of consultations for later analysis, and the measurement of blood pressure was performed by the patient, using the HBPM method. For the analysis of interactions, the Micromedex database and the patient's package leaflet were used. The patient had a significant decrease in his BP with the follow-up; however, he showed resistance to going to the doctor. After some guidance, the patient agreed to go to the consultation and he was diagnosed with Renal Failure and Prostatic Hyperplasia. It is concluded that pharmaceutical care can be an effective alternative in obtaining better clinical results and helps to improve the patient's quality of life, since it can provide awareness of their health

status and the need for the correct use of medications, making the most effective and safe treatment.

**Keywords:** Pharmaceutical consultation; Clinical pharmacist; Pharmaceutical care; Chronic illness.

### **Resumo**

A insuficiência cardíaca é uma doença crônica que compromete a qualidade de vida do paciente, devido aos seus sintomas, tais como: cansaço/fadiga, intolerância ao exercício, ortopneia e dispneia paroxística noturna. O objetivo do presente estudo foi intervir e auxiliar no tratamento do paciente com Insuficiência Cardíaca com abordagens farmacológicas e não farmacológicas a fim de melhorar a qualidade de vida e a adesão do paciente à doença existente. Sendo assim, foram realizadas consultas farmacêuticas, ao longo de sete meses, com um paciente portador de Insuficiência Cardíaca, residente em Umuarama-PR, atendido em domicílio. Adotou-se o método SOAP para o registro das consultas para posterior análise, e a aferição da pressão arterial foi realizada pelo próprio paciente, por meio do método MRPA. Para a análise das interações, foram utilizadas a base de dados Micromedex e a bula de medicamentos do paciente. O paciente teve uma diminuição significativa da PA com o acompanhamento; no entanto, ele mostrou resistência em ir ao médico. Após algumas orientações, o paciente concordou em ir à consulta e foi diagnosticado com Insuficiência Renal e Hiperplasia Prostática. Conclui-se que a assistência farmacêutica pode ser uma alternativa eficaz na obtenção de melhores resultados clínicos e auxilia na melhoria da qualidade de vida do paciente, pois pode proporcionar o conhecimento do seu estado de saúde e a necessidade do uso correto dos medicamentos, tornando o tratamento mais efetivo e seguro.

**Palavras-chave:** Consulta farmacêutica; Farmacêutico clínico; Assistência farmacêutica; Doença crônica.

### **Resumen**

La insuficiencia cardíaca es una enfermedad crónica que compromete la calidad de vida del paciente, debido a sus síntomas, tales como: cansancio / fatiga, intolerancia al ejercicio, ortopnea y disnea paroxística nocturna. El objetivo del presente estudio fue intervenir y asistir en el tratamiento de pacientes con Insuficiencia Cardíaca con abordajes farmacológicos y no farmacológicos con el fin de mejorar la calidad de vida y el cumplimiento del paciente con la

enfermedad existente. Por tanto, las consultas farmacéuticas se realizaron durante un período de siete meses con un paciente con Insuficiencia Cardíaca, residente en Umuarama-PR, atendido en su domicilio. Se adoptó el método SOAP para registrar las consultas para su posterior análisis, y la presión arterial fue medida por el propio paciente, mediante el método MRPA. Se utilizó la base de datos Micromedex y el prospecto de medicación del paciente. El paciente tuvo una disminución significativa de la PA con el seguimiento; sin embargo, mostró resistencia a ir al médico. Tras algunas orientaciones, el paciente accedió a acudir a la consulta y se le diagnosticó insuficiencia renal e hiperplasia prostática. Se concluye que la asistencia farmacéutica puede ser una alternativa eficaz en la obtención de mejores resultados clínicos y ayuda a mejorar la calidad de vida del paciente, ya que puede proporcionar conocimiento sobre su estado de salud y la necesidad del correcto uso de los medicamentos, haciéndolos el más efectivo y seguro.

**Palabras clave:** Consulta farmacéutica; Farmacéutico clínico; Cuidado farmacéutico; Enfermedad crónica.

## 1. Introduction

Heart failure (HF) is a cardiac or functional abnormality, characterized as a chronic disease where it compromises the individual's daily life, affecting cardiac output and causes discomfort during activities (Fonseca et al., 2017). The typical signs and symptoms of HF are: tiredness/fatigue; shortness of breath/dyspnea; exercise intolerance; orthopnea; paroxysmal nocturnal dyspnea (Rohde et al., 2018). Approximately, 240 thousand cases are diagnosed in Brazil, every year, due to the increase in population ageing, and the wide improvement of patients with diseases that could be fatal, such as ischemic cardiomyopathy (Graciano et al., 2015).

The risk factors for developing HF have a classification, entitled as modifiable (they are correlated with changes that can be made to alter the course of diseases, such as high blood pressure, obesity, physical inactivity, tobacco use, diabetes, etc.) or not modifiable (these are the individual's personal characteristics, such as family history, male gender and age) (Lopes, 2016; Teston et al., 2016). The risk of developing HF becomes higher when these factors are associated with each other; therefore, guidance on their prevention is important (Teston et al., 2016).

Thus, it is meaningful the role of pharmacists to perform pharmacotherapeutic follow-up, addressing non-pharmacological treatment. They can help patients to control their blood

pressure, diet, weight and common habits that may be harmful, giving greater attention to the patients and their health (Pinto et al., 2020).

The high consumption of industrialized medicines by the Brazilian population has favored familiarity with these substances and boosted indiscriminate use and / or self-medication, due to their lack of specific knowledge about adverse reactions and active principles with regard to medication (Guedes, Brito & Silva, 2020).

The fundamental principles of clinical pharmacist are the prescriptions evaluation, medicine dosages, form of administration, storage of medications, adherence and rational use of medications, and adverse reactions with medications and/or foods (Nicoletti & Ito, 2018). This service should be performed with the collaboration of the patient and by other health professionals, being continuous and documented, in order to improve the patient's quality of life (Oliveira et al., 2019; Costa & Klock, 2019).

Studies highlight that the lack of adherence, both non-pharmacological and pharmacological, has contributed to the decompensation of HF in approximately 1,263 patients in various regions of Brazil (Albuquerque et al., 2015; Azevedo et al., 2018). Therefore, the aim of the present study was to monitor the treatment of a patient with Heart Failure, in order to improve his treatment and his lifestyle.

## **2. Methodology**

A case study was carried out on the pharmaceutical consultation was conducted twice a month, previously scheduled with a patient diagnosed with Heart Failure (HF) who lives in the city of Umuarama/PR, for seven months, from July 2019 to February 2020.

The patient sexo male e 65 years old, used medications: Losartan Potassium 50mg, Furosemide 40mg, Carvedilol 6.25mg and Amlodipine 5mg. The choice of the study patient was due to the fact that he had a chronic disease and used various medications.

According to Resolution (RDC) No. 585 of August 29, 2013, which “Regulates the clinical duties of the pharmacist and provides other measures”. According to the present RDC, the different pharmaceutical clinical services, for example, pharmacotherapeutic follow-up, therapeutic reconciliation or pharmacotherapy review are characterized by a set of specific activities of a technical nature. These activities are legally based on the definition of clinical duties of the pharmacist (Conselho Federal de Farmácia, 2013).

For data collection, a questionnaire was applied, containing the patient's profile, social history, health problems and complaints, current pharmacotherapy, complementary therapies,

among others, according to methodologies described by Zubioli, A. (2011); Zubioli et al. (2012); Zubioli et al. (2013) with changes.

The objective of pharmaceutical consultation was to accompany and assist him with the correct use of medications, the difficulties in ingesting any medication, the possible abandonment of treatment, blood pressure (BP) measurement, and investigation of possible drug interactions. For that purpose, medications in which the patient makes use, a research was conducted to investigate possible drug interactions. The medications which were prescribed had their trade names, active ingredients and prescribed dosages noted. Afterwards, the patient reported how he used each medication, food-drug interaction or medication-medication. Regarding pharmacotherapy, the patient was asked about his "polypharmacy", which according to the World Health Organization (WHO), is when four or more medications are routinely used (with or without medical prescription) (Medication Without Harm, 2017). In addition, three BP measurements were performed in each consult, with an interval of one minute, and the average of the last two measurements was considered. The patient was asked to perform the home blood pressure measurement (HBPM). This method was adopted due to the advantages of obtaining a greater number of BP measurements, avoiding the effect of the white apron, which consists of altered values when obtained in front of a health professional, which may lead to a false need for therapeutic adequacy and to greater patient engagement in relation to pharmacotherapeutic follow-up (Sociedade Brasileira de Cardiologia, 2017).

We used the SOAP method, where (S) subjective, (O) objective, (A) assessment and (P) plan to record the consultations.

The preparation of this article followed the standards of scientific methodologies, according to Pereira et al. (2018). This study as previously submitted to the Ethics Committee of the Paranaense University and was approved, with the opinion attached under the Certificate of Presentation for Ethical Appreciation (CAAE) number: 25506619.8.0000.0109.

### **3. Results and Discussion**

#### **Description of the medications the patient takes daily**

Losartan Potassium is an antihypertensive, angiotensin II receptor blocker. It is a drug also indicated for Heart Failure when treatment with an angiotensin-converting enzyme inhibitor (ACE) is not the best indication. Losartan is also indicated to delay the progression

of kidney disease. This delay is assessed based on the reduction of the combined incidence of serum creatinine doubling, end-stage renal failure (need for dialysis or kidney transplant) (Losartana, 2017).

Furosemide is a loop diuretic, used in the treatment of mild to moderate arterial hypertension, edema due to heart, liver and kidney disorders and edema due to burns. Its diuretic and antihypertensive effect promotes urine excretion and assists in the treatment of high blood pressure, respectively (Furosemida, 2007).

Amlodipine is a calcium channel blocker, indicated as a first-line drug in the treatment of arterial hypertension, and it can be used in most patients as a single blood pressure control agent. Patients who are not adequately controlled with a single antihypertensive agent may benefit from the addition of amlodipine, which has been used in combination with thiazide diuretics, alpha-blockers, adrenergic beta-blockers or ACE inhibitors (Anlodipino, 2020).

Carvedilol is neurohormonal blocker of alpha-blocking action used for the treatment of congestive Heart Failure and hypertension. It promotes the dilation of blood vessels by blocking the system called renin-angiotensin-aldosterone, with a decrease in blood pressure (Carvedilol, 2017).

### **Heart failure (HF)**

Heart failure (HF) is a very common syndrome in the population, being considered the final destination of most cardiovascular diseases. This syndrome is characterized as the impediment of sufficient blood pumping to meet the needs of patients, both metabolic and tissue of the organism (Sousa et al., 2017).

HF has two stages, one the patient remains stable, which is called as the chronic phase, the other highlights the routine decompensation which leads to hospitalizations of the patient, being known as the acute phase; this phase presents characteristic signs and symptoms of the disease, where the ventricle impaired in storing or ejecting blood causes fatigue, dyspnea and, water retention, which can lead to peripheral edema and pulmonary congestion (Pereira et al., 2016).

The diagnosis is made through the identification of the patient's signs and symptoms; however, chronic patients may present absence of these clinical signs, not demonstrating specificity, due to the adaptation of the lymphatic system that presents this condition for a long time due to cardiac congestion. The signs that stand out in these patients are the third

heart sound and the symptom of orthopnea, being the most specific for diagnosis (Rohde et al., 2018).

According to data from the Informatics Department of the Unified Health System (DATASUS), about 208,000 hospitalizations were performed in 2017 in Brazil, of which 22,000 deaths were registered (Brasil, 2017). HF has been one of the main causes of hospitalization in patients over 60 years of age, and studies show that about 50% of patients discharged from the hospital are readmitted after 90 days (Pereira, 2019).

HF carriers generate high costs as they need continuous assistance in order to reach a good quality of life level. In 2015, the records of the Health Indicators in DATASUS indicated a total of approximately 327 million Reais with hospital services and care, of which 1.6 million days of hospital stay - that is, about 7.3 days/patient (Camuzi, 2017).

Treatment for these patients is based on angiotensin-converting enzyme (ACE) inhibitors and/or angiotensin II receptor blockers (ARBs), beta-adrenoceptor antagonists (BB) and aldosterone antagonist (AA). In symptomatic patients, positive diuretics and inotropic drugs are recommended (Camuzi, 2017).

In addition to pharmacotherapy, some measures should be taken to improve the patient's signs and symptoms of the disease. Those include adherence to treatment without interruption, practice of physical exercises (when authorized by the prescribing physician), controlled feeding, lifestyle change and monitoring in order to predict the signs and symptoms of decompensation of the disease. In this phase, the search for immediate medical assistance helps to reduce the number of hospitalizations (Linn, Azzolin & Souza, 2016).

Given all the above, it is important that the patient has knowledge about the disease he/she has, and it is necessary to perform health education, in order to inform and guide the treatment and the necessary measures to control the disease. These measures help to improve the patient's quality of life (Azevedo et al., 2018).

### **Pharmacotherapeutic Follow-up (PF)**

Pharmacotherapeutic follow-up (PF) consists of conducting several consultations with the patient, managing the pharmacotherapy and performing an analysis of risk factors, their health condition and treatment. During these consultations, medications with or without medical prescription are collected. The specialist seeks, then, solve the problems related to pharmacotherapy. All interventions are documented in order to find solutions and prevent complications (Conselho Federal de Farmácia, 2016).



The PF service can be performed both at home, public pharmacies and hospitals<sup>23</sup>, and other pharmaceutical services can be implemented within these routine consultations, such as health screening, health education and drug reconciliation (Conselho Federal de Farmácia, 2016).

The main objective of this service is related to the prevention and resolution of the patient's pharmacotherapy. The procedure aims at adherence to treatment and rational use, and could be a contributing factor to their quality of life, reducing risks and obtaining good clinical results (Conselho Federal de Farmácia, 2016).

Thus, in order to perform a good follow-up, patients need to know clinical pharmacy, since it is necessary to understand the particularities of drugs, of the disease and, especially, the patient's characteristics (Lopes, 2016).

Elderly patients belong to a group in which the percentage of chronic diseases and physiological changes, caused due to the aging process, make the PF service essential. Such factors compromise the response to medications due to pharmacodynamic and pharmacokinetic specificities (Pinto, 2020).

Alterations seen in association with polypharmacy may cause exacerbated drug reaction, lack of pharmacological effect or adverse reactions. Moreover, food and drug interactions may arise, causing lack of adherence and failure in pharmacotherapy (Pinto, 2020).

### **Pharmaceutical Consultation (PC)**

Pharmaceutical care consists of predicting, preventing and controlling adverse effects of medicines. The pharmacist's main objective is to monitor pharmacological treatment. The professional must pay attention for undesirable or toxic effects and drug or food interactions. Thus, patient can reach a better quality of life. In most cases, pharmacological treatments become inefficient due to patients' lack of knowledge. Therefore, pharmaceutical attention aims to improve the use of medicines (Tasso, 2015).

In a pharmaceutical consultation (PC) the professional has the objective of finding a treatment that meets the patient's needs. The health condition and characteristics must be kept in the medical record (Costa, 2017).

There are four steps for the consultation: Perform individual follow-up: consists of obtaining the patient's results and progress in order to treat new problems; Conduct collection and organize patient data: it aims to understand the reasons for the consultation, patient

specificities and pharmaceutical and clinical history; Develop a care plan: it means setting goals together with the patient, intervening when necessary and schedule a return to continue the pharmacotherapeutic follow-up; Identify medicine-related problems: includes conducting a situational analysis, reviewing pharmacotherapy and identifying existing or potential problems, i.e., those that may present risk to the patient (Costa, 2017).

## **Drug Interactions**

Drug interaction occurs when a drug is altered by taking another medication. Such interactions can cause adverse reactions and loss of drug efficacy (Alves et al., 2019), which, in turn, can impair the treatment, not achieving the objective of the therapy (Oliveira, 2018).

The pharmacist has the role of identifying drug interactions and evaluating patients' responses to proposed therapies. This identification usually takes place in hospital settings due to the administration of large number of drugs. Taking into account the high rates of medication misuse outside hospitals, the role of pharmacists acquires great relevance in the current scenario.

Knowledge of pharmacological interactions is essential to curb drug toxicity. It is necessary to develop dosing schedules that adjust dosages, allow the choice of alternative agents and anticipate possible synergisms that minimize drug resistance processes (Oliveira, 2018).

During the first visit, the patient was asked what was the storage place of his medications. He replied that he was storing them on top of the refrigerator in the kitchen. Thus, the patient received guidance to exchange the storage location of his medications for an airy place, away from humidity and with a more pleasant temperature (Silva & Geron, 2018). Silva & Geron report in their studies that medications stored in inappropriate places, such as kitchen and bathroom or with direct incidence of light, can cause chemical, physical and microbiological changes, and may even cause toxic effects depending on their degradation.

Balk et al. (2015) in their study, visited 20 households in the city of Uruguaiana-RS and found polymedicated patients; These patients performed inadequate storage of their medications, for example, in the bathroom, in the kitchen, etc. Thus, 35% of these medications were still exposed to light, 55% to heat and 40% to moisture. This a serious issue, since these factors can lead to drug degradation, compromising its stability and the efficacy of treatment.

Another study conducted in Rondônia - Brazil with 358 residents, in order to analyze the storage of medications of patients who contained a home pharmacy, found that 52% kept the drugs in the room, 38% in the kitchen, 3.63% in the bathroom and 0.55% in a separate closet only for medications (Silva & Geron, 2018).

Thus, it is noted that most of the population is unaware of the correct way to store medicines, since the present study and other studies report inadequate storage; consequently, correct guidance becomes important, since storage is a relevant requirement for the drug to have the necessary efficacy and meet the proposed treatment (Silva & Geron, 2018).

After the first consultations, analyses of possible drug interactions were performed due to the drugs used, for this, sites such as [medscape.com](http://www.medscape.com), the Micromedex database® and package leaflets of the drugs were used. The results found are expressed in Table 1.

**Table 1.** Drug interactions of medications that the patient ingests daily for chronic disease.

<b>Medication</b>	<b>Effect of drug interaction</b>	<b>Consequence for the patient</b>	<b>Reference</b>
<b>Non-steroidal anti-inflammatory drugs (NSAIDs) (Indomethacin)</b>	NSAIDs antagonize the effect of Losartan Potassium.	Sympathomimetics reduce the effect of Losartan and ginseng should be avoided, as it can worsen hypertension.	Losartan (2017)
<b>Furosemide</b>	May potentiate the ototoxicity of aminoglycoside antibiotics and other ototoxic drugs.	The resulting effects on hearing may be irreversible.	Furosemide (2007)
<b>Furosemide and Sucralfate</b>	Sucralfate reduces intestinal absorption of Furosemide.	Reduction of the effect. Wait at least a 2hour period between one administration and another.	Furosemide (2007)
<b>Carvedilol with Digoxin</b>	-	It could cause possible bradycardia. .	Carvedilol (2017)
<b>Carvedilol</b>	Avoid herbal medicines with hypertensive	Decreased antihypertensive effect of Carvedilol.	Carvedilol (2017)

	properties, such as licorice, ephedra, ginger, myrtle and cayenne pepper.		
<b>Carvedilol</b>	Avoid herbal medicines with hypotensive properties, such as shepherd's purse, black cohosh, quinine, vinca and mistletoe.	They may increase the hypotensive effect of Carvedilol.	Carvedilol (2017)
<b>Carvedilol with Rifampicin</b>	-	Rifampicin may cause reduced plasma concentration of Carvedilol.	Carvedilol (2017)
<b>Carvedilol with Verapamil</b>	-	Verapamil can cause an increase in the plasma concentration.	Carvedilol (2017)

Source: Authors.

After the analysis performed on the medications (Table 1) that the patient ingests daily, it was found that they do not present interactions with each other, concluding that the treatment offered to the patient, a pre-study was carried out regarding the interactions, demonstrating the absence of the interactions.

Amlodipine has been safely administered with thiazide diuretics, alpha-blockers, beta-blockers, angiotensin-converting enzyme (ACE) inhibitors, long-acting nitrates, nitroglycerin sublingual, nonsteroidal anti-inflammatory drugs, antibiotics, and oral hypoglycemics. In vitro data from studies with human plasma indicate that amlodipine does not affect the binding to proteins of the drugs tested (digoxin, phenytoin, warfarin or indomethacin) (Anlodipino, 2020).

During consultations, the patient complained of difficulty in holding urination. Studies developed by Carmo, Maruxo & Santos (2017) showed that HF brings limitations in people's quality of life, one of the factors is the difficulty of sleeping due to nocturia.

It was observed that the lower limbs had edema, and the patient was instructed to return to the doctor. During the consultations, it was observed that his lower limbs returned to normal, that is, without edema. The patient claimed to be taking the herbal medicine Chestnut

of India. The medication works by relieving the symptoms of venous insufficiency, such as the sensation of pain and heaviness in the legs, swelling, cramps and itching, providing an increase in peripheral vascular resistance and improving the return of venous flow (Castanha da Índia Herbarium, 2014). As the limb returned to normal, the patient stopped using the medication. The patient was instructed to return to the medicine usage, due to the possibility of the return of the edema.

Due to the problems found, some non-pharmacological measures were taken in the patient's diet, such as, for example, the inclusion of fruits, vegetables, dairy products with low fat contents, as they have benefits on blood pressure. Fruits like bananas, rich in potassium, bring benefits to the heart and help control blood pressure (Zyrianoff, 2019).

Papaya helps in the regulation of the cardiovascular system because they have beneficial properties that help to keep the organ functioning properly (Lima, 2019). Avocado decreases sodium levels in the body, which lowers blood pressure, as it has a high content of monounsaturated fat that becomes an ally of the heart. These substances reduce risk factors for cardiovascular diseases (Cerquetani, 2019). Vegetables, such as cabbage, are a great ally of the heart, due to the content of folic acid, magnesium and vitamin C, which act in the prevention of cardiovascular diseases (Mendes, 2018). Low-fat dairy products, such as milk, have various nutrients such as calcium and potassium that can lower blood pressure (Medication Without Harm, 2017).

According to Mendes (2018) the consumption of simple carbohydrates (such as soda, white rice, breads, etc.) should be avoided, because in excess it can lead to insulin resistance, which can worsen sodium and water retention. The same authors advocate that patients should increase their intake of fatty acids, such as omega 3, avoid trans-fat and reduce their salt intake. Moreover, their fluid intake should be between 1.5 to 2.0 l/day, which may decrease manifestations of the disease and avoid congestion.

After the fifth month of consultation, the patient was diagnosed with Renal Failure (RF) and Prostatic Hyperplasia. According to the Brazilian Society of Nephrology (2020), RF is the decrease in filtration through the kidneys of salts and blood fluids. When this happens, these residues can be out of balance causing swelling in the legs, ankles or feet, decreased production urine, lack of hunger, drowsiness, among others. Prostatic hyperplasia is the enlargement of the prostate gland and since it is very close to the bladder and involves part of the urethra, its increase may impair the ability to urinate (Finasterida, 2020).

Medicines have been added: Finasteride 5mg and Doxazosin 2mg. According to the package leaflet, Finasteride is a 5-alpha-reductase inhibitor; it causes regression of the

prostate hypertrophy (enlargement), decreases the enlarged prostate volume and relieves urinary symptoms. Finasteride helps to reduce the risk of developing a sudden inability to urinate (acute urinary retention) and the need for surgery (Finasterida, 2020). Doxazosin, belongs to the class of drugs called antihypertensives (which lower blood pressure). It works by relaxing blood vessels allowing blood to pass more easily and also relaxes the muscles of the prostate and neck (lower part) of the bladder (Mesilato de Doxazosina, 2020).

Laboratory tests were monitored for ten days and the indicators of renal function were Creatinine, Glomerular Filtration Rate and Urea, as shown in Table 2. The patient showed improvement in the results over the days.

**Table 2.** Laboratory tests performed by the consulted patient.

<b>Examination</b>	<b>12/13/2019</b>	<b>12/16/2019</b>	<b>12/17/2019</b>	<b>12/19/2019</b>	<b>12/19/2019</b>	<b>12/23/2019</b>
Creatinine	3,68	2,63	2,55	2,82	2,27	2,03
	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL
Glomerular filtration rate	15,0638	22,6109	23,4707	20,7822	27,0157	30,9228
	mL/minute	mL/minute	mL/minute	mL/minute	mL/minute	mL/minute
Urea	131	86	70	55	35	29
	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL

Caption: mg/dL - milligrams per deciliter; mL/minute - milliliter per minute. Source: LABI - Laboratory of Clinical Analysis Ivaiporã (Laboratório de Análises Clínicas Ivaiporã) – 1440, Souza Naves Avenue.

Table 2 shows the main marker exams to diagnose RF. The glomerular filtration rate (GFR) is the main marker of RF; from the moment the RF advances, the glomerular filtration rate (GFR) reduces and consequently loses renal function (Sousa, Pereira & Motta, 2018). RF is diagnosed when the glomerular filtration rate is less than 60 mL/minute and is severe or renal failure when the glomerular filtration rate is less than 15 mL/minute (Malta et al., 2019).

The results obtained indicate that the patient could have developed renal failure. Table 2 demonstrates the importance of pharmacotherapeutic follow-up. In this context, examinations should be performed in order to postpone the progression of the disease and to correct health problems arising from kidney malfunction.

Creatinine provides important data for glomerular filtration, as it is used as a useful marker. Urea filters, cleans and dehydrate toxic waste produced by the body; it is also reabsorbed by the renal tubule after the filtration process (Sousa, Pereira & Motta, 2018). The reference values for creatinine are between 0.6 to 1.3 mg/dL, and urea between 20 to 50 mg/dL (Dallacosta, Dallacosta & Mitrus, 2017).

The analysis of the prescriptions focused on the following points: possible pharmacological interactions, dietary monitoring, investigation of laboratory tests and blood pressure monitoring. The measurements were made by the patient himself, who performed them in the morning and evening. Three measurements were made with an interval of 1 minute between each. As recommended by Brazilian Society of Cardiology (2017) through the 7th Brazilian Guideline for Arterial Hypertension, the first measurement was discarded and the average was composed of the last two measurements. The results obtained are shown in tables 3 and 4.

**Table 3.** Measurement performed by the patient using the HBPM method in July, 2019.

Day	Time	BP-morning measurements	Average	Measure ment time	BP-night measurements	Avara ge
1st day 11/07 /2019	08:34	Measurement: 162/71 Measurement 2: 151/70 Measurement 3: 148/68	149/69 mmHg	19:06	Measurement 1: 160/73 Measurement 2: 161/70 Measurement 3: 160/69	160/69 mmHg
2nd day 07/12 /2019	08:27	Medida 1: 161/78 Measurement 2: 152/63 Medida 3: 153/68	152/65 mmHg	19:13	Measurement 1: 138/56 Measurement 2: 137/61 Measurement 3: 125/56	131/58 mmHg
3rd day 07/13 /2019	08:30	Measurement 1: 164/82 Medida 2: 152/71 Measurement 3: 150/68	151/69 mmHg	19:10	Measurement 1: 148/73 Measurement 2: 145/71 Measurement 3: 152/69	148/70 mmHg
4th Day 07/12 /2019	08:26	Measurement 1: 163/72 Measurement 2: 162/70 Measurement 3: 160/71	161/70 mmHg	19:12	Measurement 1: 163/72 Measurement 2: 162/70 Measurement 3: 160/73	161/71 mmHg
5th Day 07/15 /2019	08:37	Measurement 1: 165/72 Measurement 2: 163/70 Measurement 3: 161/72	162/71 mmHg	19:15	Measurement 1: 156/64 Measurement 2: 160/63 Measurement 3: 153/64	156/63 mmHg

Caption: mmHg - mercury millimeters; BP: Blood pressure. Source: Authors.

The Table 3 show some daily variations in the patient's average BP. These changes can occur due to both environmental and physiological stimulations, and it is important to take several measures for better precision. The results presented during the follow-up, however, were positive for the patient, with a significant decrease in his BP.



**Table 4.** Measurement performed by the patient using the HBPM method in February 2020.

Day	Time	BP-morning measurements	Average	Measurement time	BP-night measurements	Average
1st Day 02/18 /2020	08:25	Measurement 1: 146/53	134/47 mmHg	19:16	Measurement 1: 132/65	126/66 mmHg
		Measurement 2: 136/48			Measurement 2: 128/67	
		Measurement 3: 133/46			Measurement 3: 125/66	
2nd Day 02/19 /2020	08:30	Measurement 1: 144/58	131/53 mmHg	19:24	Measurement 1: 136/58	132/55 mmHg
		Measurement 2: 130/52			Measurement 2: 134/55	
		Measurement 3: 132/55			Measurement 3: 130/56	
3rd Day 02/20 /2020	08:36	Measurement 1: 148/61	144/53 mmHg	19:09	Measurement 1: 130/68	123/63 mmHg
		Medida 2: 143/56			Measurement 2: 124/62	
		Measurement 3: 145/51			Measurement 3: 122/64	
4th Day 02/21 /2020	08:18	Measurement 1: 139/73	133/66 mmHg	19:13	Measurement 1: 134/62	132/59 mmHg
		Medida 2: 135/68			Measurement 2: 131/58	
		Medida 3: 132/65			Measurement 3: 133/60	
5th Dia 02/22 /2020	08:24	Measurement 1: 134/65	131/64 mmHg	19:28	Measurement 1: 126/62	122/62 mmHg
		Measurement 2: 130/68			Measurement 2: 123/64	
		Measurement 3: 132/60			Measurement 3: 121/60	

Source: Authors.

The Table 4 show some daily variations in the patient's average BP. It was noticed that when compared with Table 3, the results showed a significant improvement in the patient's blood pressure. The results presented during the follow-up, however, were positive for the patient, with a significant decrease in his BP.

Saliba et al. (2016), underwent a pharmacotherapeutic follow-up with a total of 50 patients with Metabolic Syndrome (MS). The aim was to control cardiovascular comorbidities and reduce the risk of coronary events. At the beginning of the study, the author had 30% (N = 15) of patients with two criteria for MS and 70% (N = 35) had three to five criteria. At the

end of the analysis, only 28% (N = 14) had three to four criteria, while 84% (N = 42) obtained control of one or more criteria; this means that there was control of BP, TG, HDL and fasting blood glucose after medical follow-up.

Another study was carried out at the Pharmacy-School of the Municipal University of São Caetano do Sul (FarmaUSCS). Eighteen hypertensive patients were monitored in the period of four months. Results show that only 11.1% of the patients had controlled BP from the beginning. After the follow-up, they had an increase of 72.2% of BP control. The average decrease was 23.8 mmHg, which shows the importance of the pharmacist in accompanying the patient in his/her treatment (Silva, Aragão & Sabino, 2016).

Unfortunately, the patient was refractory to seek medical assistance and he did not present the laboratory tests for correct analysis and monitoring; however, the present study demonstrates, the importance of the pharmacist in treatments. Thus, good results and improved quality of life can only occur when there is proximity between professionals and patients.

#### **4. Conclusion**

Despite the difficulties in the pharmaceutical consultation, the patient finally decided to seek medical help after several orientations. It is necessary to make the population aware of health care and the need for the correct use of medicines, which makes treatments more effective and safer.

Subsequently, renal failure and prostatic hyperplasia were diagnosed. It is concluded, then, that pharmaceutical care can be an effective alternative in obtaining better clinical results and improving patients' quality of life. Therefore, further studies, with other patients, are necessary to demonstrate the importance of pharmacotherapeutic follow-up within the health area and with that, patients seek out pharmacists for the pharmaceutical consultation together with the prescribing physician.

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