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# CONTRIBUTION OF PHARMACEUTICAL SERVICES FOR THE IMPROVEMENT OF THE QUALITY OF LIFE OF HTLV CARRIERS

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**ABSTRACT**

HTLV virus belongs to the family Retroviridae, being the first retrovirus found in humans. HTLV type 1 (HTLV-1) was initially related to T-cell leukemia. This study aimed to describe the importance of pharmaceutical services for the treatment of HTLV patients. The bibliographic search was carried out in the last ten years, in studies to the electronic databases such as: Scielo, Bireme, Fiocruz, website of the Federal Council of Pharmacy, Ministry of Health. The following descriptors were used for online research: HTLV, epidemiology, pharmaceutical, pharmaceutical attention. After the analysis of the reading of the files found, it was observed its publication time and fit the proposal to be reached within the chosen theme. The included publications for the study were in Portuguese language with the period of publication within the established. In total, 26 articles were chosen with the proposed theme, and after analysis only those that fit the chosen theme were used. With the elaboration of this study it was possible to reach the conclusion about the importance of the pharmaceutical professional in the treatment of HTLV virus carriers and in the pharmacotherapeutic aid, and in the improvement of the quality of life of these individuals.



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## INTRODUCTION

Human T-cell lymphotropic virus (HTLV) has been contagious for thousands of years, but the understanding of its true pathogenicity is current. HTLV-1 is endemic in several parts of the world, for example in Africa, southern Japan, and South America. In Brazil, HTLV-1 is also found in all regions where surveys have been conducted, with varying prevalence, and estimates of approximately 2,5 million people living with the virus, although the infection does not directly cause pathological demands[1]. HTLV-1 is linked to two major diseases: HTLV-associated myelopathy (HAM) and tropical spastic paraparesis (TSP), now known as HAM / TSP and adult T-cell leukemia (ATL). Other diseases are also related to HTLV, such as HTLV-associated uveitis (HAU), polymyositis, bronchoalveolar pneumonia, autoimmune thyroiditis and arthritis. The use of antiretroviral such as zidovudine (AZT) in combination with interferon-alpha (INF-ALFA) was standardized by the Brazilian Ministry of Health for the treatment of ATLand immunomodulatory drugs associated with other drugs (baclofen, diazepam, tizanidine, and carbamazepine) for the treatment of HAM / TSP[2-5]. It is known that until now there are no reports of cure for HAM / TSP, ATL and other pathologies related to HTLV virus, considering drug therapy and a multidisciplinary team approach (psychologists, physiotherapists, nutritionists, psychiatrists, social workers, medical specialists in rheumatology, ophthalmology, urology, physiatrist and infectology) aimed at reducing the sequelae and improving the quality of life of patients affected[6]. According to Article 2 of Resolution 585 of the Federal Council of Pharmacy, which provides for the clinical attributions of the pharmacist, it is the attribution of this, the promotion and recovery of health, in addition to prevention of diseases and other health problems. Article 3 of this Law also assigns to the pharmaceutical professional, the provision of health care, in all places and levels of care, whether in public or private services. In article 6, the resolution emphasizes that the pharmacist, in the exercise of clinical duties, has the duty to contribute to the generation, diffusion and application of new knowledge that promote the health and well-being of the patient, the family and the community. However, in the articles reviewed and cited here, the pharmacist does not include multidisciplinary

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teams or does not have a professional role assigned or defined in the role of pharmaceutical assistance to promote the rational use of medicines, or optimize pharmacotherapy and minimize adverse reactions to (ADRs), as well as drug interactions, adverse effects or toxicity of these in patients infected with HTLV and development of ATL, HAM / TSP and other disorders[6]. The use of medications to treat some of the pathologies caused by HTLV 1 and 2 infections are standardized and follow protocols approved by the Ministry of Health. Order No. 54 of July 18, 2006 establishes zidovudine (AZT) associated with interferon alpha (INF-alpha) for treatment of ATL. However, AZT has interactions with other drugs, such as acetaminophen and acetylsalicylic acid, which are freely available to the population, as well as other over-the-counter drugs for the treatment of other diseases[7]. For the treatment of HAM / TSP, drugs such as muscle relaxants, urinary antispasmodics and analgesics[9], glucocorticoids, interferons, antiretroviral such as zidovudine and lamivudine, gamma globulin aiming at the decrease and progression of signs and symptoms of the disease. Currently immunomodulatory drugs are those that seem to be more effective in pharmacological intervention[6]. Methylprednisolone associated with antispasmodic drugs under study at the EmílioRibas Institute of Infectology showed improvement in the neurological status of the patients described in a cohort study. Immunomodulators have interactions with several other drugs, including antidiabetics, antiemetic: dramin, fenergan; nonsteroidal anti-inflammatory drugs: ibuprofen, diclofenac sodium and potassium, nimesulide among others, also free-selling, without the need for prescription or prescription[9]. It is in this context that the performance of the pharmacist can be evidenced, since this is the professional most relying on their knowledge about drugs, the risks of adverse reactions, collateral and toxic and more pertinent in the drug interactions in patients affected by the virus HTLV and its consequent comorbidities, as well as for the general population, who are increasingly self-medicating with the information they obtain nowadays, as well as with the deficit and the difficulty of obtaining medical assistance / care especially in the public service.

The perspective of health education tends to develop the responsibility and autonomy of the population in relation to health. However, it understands that a technical understanding of a health professional is extremely relevant, since the knowledge about the health x illness x care process is acquired. aims to empower individuals to decide on the best strategies for the promotion, preservation and recovery of their health. The estimation of the quality of life becomes of great importance to guarantee an appropriate attention to the conducts and the diseases that, although not leading to immediate death, cause many inconveniences to the patient. Health-related quality of life can be determined as the value attributed to life, by functional damage; the assimilations and social conditions that are dominated by the disease, damages, treatments and political and economic organization of the care system. It is extremely important that patients with HTLV receive pharmaceutical care, since they need guidelines so that they can live with this pathology in the best possible way. These guidelines consist of assistance in pharmacological treatment, in the practice of physical exercises appropriate to each patient, and a balanced diet that meets the needs of each patient, which may influence their daily lives, transforming and improving the quality of life of these patients. Thus, the present study aims to consist of the association of the quality of life of HTLV patients with the participation of the pharmaceutical professional in the treatment, promoting educational measures and counseling to the patients, interacting and discussing their needs, providing information about medicines and care of its pathology.

## MATERIALS AND METHODS

We used articles published in the Portuguese language from 2007 to 2017. Of the 81 files found, 37 excluded after reading the titles and abstracts because they did not address the subject under study, 19 files discarded for not addressing the content of interest and 25 used as source of for this work.

## Review

**Historyofhtlv:** The HTLV virus belongs to the family Retroviridae, from the subfamily Orthoretrovirinae and to the genus Deltaretrovirus, being the first retrovirus found in humans. HTLV type 1 (HTLV-1) was initially related to T-cell leukemia in adults in Japan in 1977 and later found in several parts of the world, followed by neurological diseases known as HTLV-associated myelopathy (HAM ) and tropical spastic paraparesis (TSP), which is currently known as HAM / TSP. HTLV type 2 (HTLV-2) was later discovered in 1982 in a patient presenting with tricholeukemia (hairy cell leukemia) with differences in their antigens compared to HLTV-1, and has no relation to neurological pathologies. Later, in 2005, the discovery of two new types of this virus, HTLV-3 and HTLV-4, which have not yet been associated with diseases in infected individuals, was reported[9]. Studies indicate that HTLV virus may have arisen on the African continent through the contact of uninfected humans with primates infected with the T-cell lymphotropic virus (STLV) [11-14]. Sprouting and transmission are evidenced on the basis of studies of the earliest descendant pygmy populations of the first human population - living in isolated regions of Africa. The virus is now widespread throughout the world[15]. In Brazil, HTLV-1 is related to the slave trade between the XVl and XlV centuries of regions of origin of the virus and that these were distributed in the north and northeast regions, which explains the high prevalence of HTLV-1 in these areas. HTLV-2 has a higher prevalence among Indians and in immigrant populations from Asia[16].

It is estimated that Bahia was the state that received the largest number of Africans from African regions at the time of the slave trade, and in Salvador approximately 80% of the population comes from Afro-descendants. The city of Bahia was described as the city with the highest rate of HTLV-1 infection in the country, with 1.8% of soroprevalence in the general population[17-19]. HTLV 1 and 2 are transmitted, mainly vertically, from mother to child through breastfeeding, through sexual contact, being more contagious from man to woman, and via parenteral, blood transfusion and its components and drug users[20, 21]. Complementary factors such as low level of schooling and vulnerable social status also increase the risks for virus transmission[22]. HTLV infection is linked to several pathologies that present a series of symptoms, although most infected individuals remain asymptomatic. The most known diseases, previously mentioned, are ATL and HAM / TSP, but other alterations may be present, such as ophthalmological, dermatological, rheumatologic and osteomioarticular diseases, which most often present with sensory-motor dysfunctions such as neuropathic pain and / or nociceptive, paresis,

paralysis and paresthesia, all of these anomalies, depending on their size, may compromise the functional capacity and, therefore, the quality of life of the individual carrying the virus[23, 24]. HTLV mainly infects peripheral T cells, predominantly CD4 + T lymphocytes from memory and CD8 + T lymphocytes, however, other cells have been described as being targets of HTLV infection as dendritic and myeloid cells. The immune response of the host to viral infection, especially the cellular response caused by anti-HTLV-specific CD8 + T cells, is recognized as a crucial event promoting the course of infection[25]. The infected cells are transformed and immortalized by the virus in vitro, becoming capable of multiplying independently of the stimulus of exogenous interleukin 2 in the culture[26]. Proteins such as Tax and Rex are involved in viral replication and cell transformation[27].

***Pathologiesrelatedtohtlv:*** HTLV infection does not directly imply the development of pathogenic processes in its patients, remaining asymptomatic, or presenting from 2% to 5% of those infected, manifesting HAM / TSP and from 1% to 3% manifesting ATL[6]. Although there are no epidemiological studies with adequate methodology that has determined the actual prevalence in the general population, most soroprevalence data show that studies conducted in poorly vulnerable populations, such as blood donors or selected groups (pregnant women, patients with neurological or hematological diseases, family members of infected persons, natives, IDUs and sex workers) and certainly are not representative of the general population. Data from studies in pregnant women may better reflect the prevalence rates of the general population than those for donor blood donors, who generally have low post-screening vulnerability[10]. Brazil adopted the screening for HTLV in blood banks from 1993[15].

**Adult t-cell Leukemia / Lymphoma (ATL):** It is characterized by the infection of the peripheral T cells, mainly CD4 + T lymphocytes and HTLV-associated CD8 + T [20]. The onset of this disease is preceded by a long latency period, with a pre-ATL phase, which is initiated by the oligoclonal expansion of the HTLV-1 infected CD4 positive T lymphocytes. The disease is heterogeneous and has four distinct clinical presentations: indolent, chronic, acute and lymphomatous [13]. The development of the disease necessitates the immortalization of infected CD4 cells, which are in principle dependent on IL-2 expression[23]. The most frequent physical findings are lymphadenopathy, hepatomegaly, splenomegaly, paleness, skin lesion, in some cases, ascites and pleural effusion. Hypercalcemia is the most characteristic clinical manifestation of ATL of the acute subtypes, and may be evident in the presentation of the disease, or arise during its clinical course, worsening the clinical picture. Hypercalcemia is one of the most important modifications that can lead to death. Therapeutic plans should be taken and treated as urgency[10]. The proposed antiretroviral therapy zidovudine combined with interferon alpha was reported by several investigators[13-16] and adopted by the Ministry of Health of Brazil in order number 54 of July 18, 2016 as first-line treatment for all clinical forms of ATL. Antiretroviral therapy with zidovudine (AZT) associated with interferon-alpha (INF-alpha) is highly effective in the leukemic form of ATL, with a significant increase in progression-free survival and overall survival when compared to chemotherapy.

**Htlv Associated Myelopathy (ham / tsp):** HAM / TSP is a slowly progressive and low lethality disease. Most studies indicate the involvement of the thoracic spine with leptomeningeal thickening and medullary atrophy in different degrees, revealing itself as a demyelinating disease involving the white matter of the lateral funiculi of the spinal cord, mainly in the thoracic and lumbar segments, but also, cervical and brainstem. In the encephalon, areas of perivascular inflammation in the cerebral white matter can be observed[18, 19]. The predominance of abnormalities in the lateral column of the thoracic spine can be explained by the hemodynamic follow-up of the blood flow in this region[40]. Two phases are highlighted in the pathophysiological process of HAM / TSP: the first inflammatory and the second degenerative. Initially, the virus infects the cells responsible for the formation of the blood-brain barrier: endothelial and adventitious cells, pericytes and astrocytes[19, 20]. Gradually a process of degeneration of the white matter occurs, especially of the lateral corticospinal tract, with little involvement of the gray matter. In the more advanced or long-term cases, the degeneration process predominates over that of inflammation[11].

To date, there is no typical and proven effective therapy for HAM / TSP. The research carried out so far can be considered methodologically inadequate, and there is no consensus as to the best medication or therapeutic procedure to be prioritized. The first therapeutic attempts were made with corticosteroids[2],administering oral prednisolone in the initial dose of 60-80 mg on intermittent days for 2 months, with a monthly reduction of 10 mg for 6 months and maintenance of 5 mg / day for a further 3 months and achieved favorable responses particularly in patients with a lower level of neurological impairment, but the clinical improvement was not permanent, with a propensity for worsening after discontinuation of corticosteroid therapy. The treatment of symptoms is still the main way to reduce the disorders associated with neurological impairment. Several drugs are used, associated or not with other drugs, for the treatment of the various symptoms caused by neurological involvement of TSP / HAM, emphasizing the pharmacology associated with physical therapy, especially in the motor and urinary tract of the affected individual. Several drugs can be used to treat the same symptom. Most of them cause similar side-effects, and in the case of drugs used to combat neuropathic pain, the variety of side effects is greater since the number of pharmacological classes that can be used is also wider[10]. The following table lists other drugs used to treat HAM / TSP symptoms, quantity and most common side effects.

***Other pathologies associated with HTLV:*** HTLV-1 (HAU) uveitis is an inflammatory disease that damages the intraocular tissues[3]. In addition to uveitis, other ocular manifestations associated with the HTLV-1 virus were found: neuro-ophthalmic deformations such as transient diplopia[15], retinal vasculitis[12-15], tumor infiltration of the eye and orbit in patients with ATL[5, 6, 9], and corneal pathologies[21]. Dermatological manifestations in the course of HTLV-1 infection have been observed since the relationship between this retrovirus and the adult T-cell leukemia (ATL) was determined[17]. Nobre[11] present a classification considering the current knowledge of the problem and the probable mechanisms involved in its pathogenesis. Thus, lesions directly caused by HTLV-1 infected cells in the skin (neoplastic and non-neoplastic), indirectly caused by cells infected by HTLV-1 in the skin (this group includes besides the modifications by immunosuppression and by neurological alterations, cytokine

**Table 1. Medication used to treat adult T-cell leukemia / lymphoma (ATL)**

| Medications | DrugInteractions | Manifestations |
|---|---|---|
| | Cimetidine | Competitive inhibition of hepatic glucuronization and decreased clearence of |
| | Acetylsalicylicacid | Zidovudine, and increased myelotoxicity |
| | Benzodiazepines | |
| | Paracetamol | |
| | Indomethacin | |
| | Morphine | |
| | Sulfamides | |
| Zidovudine | Aciclovir | Produceneurotoxicity |
| | Rifampicin | Decrease plasma concentration |
| | Probenecid | Increased serum concentration, half-life and elimination |
| | Ribavirin | Inhibition of the active triphosphate form |
| | Dapsone | Drugs considered nephrotoxic and cytotoxic |
| | Pentamidine | |
| | Amphotericin B | |
| | Flucitosin | |
| | Vincristine | |
| | Vimblastine | |
| | Adriamycin | |
| | Doxorubicin | |

**Table 2. Medications used to treat HAM / TSP symptoms**

| Symptoms Drug | Treatment Dose | Frequency | Side Effects |
|---|---|---|---|
| Spasticity | Baclofen * | 10-80 mg / day | Somnolence |
| | Tizanidine * | 4-16 mg / day | Somnolence |
| | Diazepam * | 5-40 mg / day | Somnolence |
| | BotulinumToxin ** | Individual | Weakness / Hypotonia |
| | Catheterization | 4/4 hours | ITU |
| Bladder | Intermittent | 6/6 hours | ITU |
| Neurogenic | | 5-15 mg / day | Drymouth / Constipation |
| | Oxybutynin | 10-75 mg / day | Drymouth / Constipation |
| Infection | Imipramine | 100 mg / day | Nausea, vomiting |
| Urinary repetition | Norfloxacin | 400 mg/dia | Náuseas, vômitos |
| Constipation | Guidance | High fiber diet, hydration, physical activity | |
| Intestinal | Nutritional | 5.8-17.4 mg / day | Colic, diarrhea |
| | MuciliaPsyllium | 7.5-30 ml / day | Colic, diarrhea |
| | Mineral oil | 10-30 ml / day | Colic, diarrhea |
| Pains | Lactulose | 25-150 mg / day | Drowsiness / Constipation |
| Neuropathic | Amitriptyline | 25-150 mg / day | Constipation / Drymouth |
| (Medullary, | Nortriptyline | 25-150 mg / day | Constipation / Drymouth |
| Radicals | Imipramine | 900-1800 mg / day | Somnolence |
| or of | Gabapentin | 400-1200 mg / day | Ataxia, aplasia |
| Neuropathy | Carbamazepine | 600-1800 mg / day | Hyponatremia |
| Peripheral) | Oxcarbamazepine | 200-300 mg / day | Ataxia |
| | Phenytoin | 60-120 mg / day | Nausea |
| | Duloxetine | 150-300 mg / day | Dizziness / drowsiness |

**Table 03. Medications used to treat HAM / TSP symptoms and major drug interactions**

| Treatment of Spasticity | | |
|---|---|---|
| Drugs | Not Recommended | Main Symptoms |
| Baclofen | Levodopa / Carbidopa | Mental confusion, hallucinations, worsening of parkinsonism symptoms |
| | Musclerelaxants | Increasedsedation |
| | Syntheticopiates | Increasedsedation |
| | Morphine | hypotension |
| | Tricyclicantidepressants | Effectofpotentiatedbaclofen |
| | Lithium | Aggravationofhyperkineticsymptoms |
| | Antihypertensives | Increasedbloodpressuredrop |
| | Medicationsaffectkidneyfunction | Reduces baclofen excretion causing toxicity |
| | | Drowsiness, dizziness and decreased psychomotor performance |
| Tizanidine | Fluvoxamine / Ciprofloxacin | |
| | Antiarrhythmics | CYP1A2 Inhibitors |
| | Cimetidine | |
| | Fluorquinolones | |
| | Rofecoxib | |
| | Oral Contraceptives | |
| | Ticlopidine | |
| | Cisapride, Amitriptyline, Azithromycin | |
| | Antihypertensives | Extendthe QT interval |
| | Rifampicin | May occasionally cause hypotension and bradycardia |
| | Benzodiazepinesorbaclofen | |
| | Clonidina | Additiveeffectofhypotension. |
| | Cimetidine, Ketoconazole, Fluvoxamine, Fluoxetineand | May increase and prolong sedation |
| | Omeprazole | Decreased therapeutic effect of levodopa |
| | Levodopa | Temporary increase of sedative effect |
| | Cisapride | Potentiation of the effect of botulinum toxin |
| | Aminoglycosideantibiotics | |

poverty, socioeconomic arrangement and human development unfavorable as compared to other populations[2,4]. The lack of research and specific studies of the real situation of the numbers of infected in the world and correct diagnosis of the infection, besides the precarious network of public health care without trained professionals, which is the only way out for the population in general, and especially for those less deprived socioeconomic, aggravates the pathological clinical picture and consequently the quality of life of the individuals with diseases caused by HTLV. Although there is proven evidence that the HTLV virus discovered in the 1980s is correlated with the manifestation of neurological and hematological dysfunctions, there have not yet been reports of treatment of the infection, and drug therapy and multidisciplinary teams of symptoms and presented by patients presenting the clinical forms[1,5,8,10]. In several states there are reference centers, institutions and projects that serve and assist the virus carriers and their families. The Ministry of Health[3], through the National Commission for the Development of Technologies (CONITEC) in the SUS, consented through the Health Surveillance Secretariat, administrative rule nº 54, which approved the protocol for the treatment of ATL in HTLV patients. Based on technical and scientific consensus of several departments related to SUS, the protocol for the use of zidovudine for the treatment of adult leukemia / lymphoma related to HTLV was adopted. An analysis showed that the use of AZT associated with alpha-INF increased the efficacy of anti-ATL therapy, with a significant reduction in the rate of progression to more aggressive forms of the disease.

AZT (3'-azido-3'-deoxythymidine) is a thymidine analogue antiretroviral that exhibits antiviral performance against HIV-1 and HIV-2, against HTLV-1 and other retroviruses. It competitively inhibits reverse transcriptase, characteristics of retroviruses, in addition to competitively inhibiting cellular thymidylatocinase, which reduces intracellular levels of thymidine triphosphate and consequently this reduction contributes to cytotoxicity and enhances its antiretroviral effects. IFN-alpha are natural proteins that modify immune responses, for antiviral, immunomodulatory and antiproliferative purposes[12-17]. In addition to the adverse events caused by the use of AZT, including anemia, abdominal discomfort, severe headache, insomnia and others, there are also drug interactions with other drugs. The use of paracetamol, acetylsalicylic acid, benzodiazepines, cimetidine, indomethacin, morphine and sulphonamides is contraindicated for patients taking therapies using AZT. The competitive inhibition of hepatic glucuronization and consequent decrease in the rate of clearance of AZT may also increase its myelotoxicity. The use of AZT concomitantly with acyclovir, another antiviral drug used against herpes simplex virus (HSV) types 1 and 2 and varicella zoster virus (VZV) is also contraindicated because it can produce neurotoxicity[13,22]. Adverse events of the use of alpha-INF are initiated within a few hours of administration, including: fever, chills, fatigue, headache, myalgia, which can be controlled with the use of acetaminophen. Also described as alopecia, pruritus, anorexia, sexual impotence, libido inhibition, drowsiness, confusion or depression. It also shows myelotoxicity being reversible upon discontinuation of use [3,6]. The pharmacological interaction of AZT with paracetamol and its indicated use for the symptomatic treatment of the use of INF-alpha presents a paradoxical condition since the damage to the patients' health has already been proven[11,19].

Both acetaminophen and acetylsalicylic acid (AAS) are over-the-counter (IPM) drugs in pharmacies and drugstores[24,25], health care facilities that count on the presence of the pharmaceutical professional, who has technical skills related to medicines and their related[6,11,20]. With the expansion of the segment of pharmacies and drugstores, access by the population to pharmacists, professionals promoting the rational use of medicines, patient and community care, optimization of pharmacotherapy with the purpose of increasing the quality of life of patients who need of pharmacological interventions, became easier and faster. The pharmacist has his participation in health teams regulated by the Federal Council of Pharmacy (CFF) and cited his participation in some Resolutions of the Board of Directors (RDC's), ordinances and regulations, but in reality day to day this does not happen as often. The pharmacist has proven its importance in the cases mentioned above, contributing with his technical knowledge in the assistance to people who use antivirals as the case of AZT, and can be decisive in preventing adverse effects when exercising their clinical duties, interacting with the patient at the time of dispensing medications, alerting him that even medications that do not require medical prescription, can cause adverse effects and drug interactions when administered with other drugs. In this context, it is evident the importance of the clinical attributions of the pharmacist, in promoting the pharmaceutical consultation in a pharmaceutical office or in an equivalent place, as granted by Resolution 585 of the CFF. Of the members of the multidisciplinary teams, the pharmacist is one of the only ones with greater ease of access of the population, being present even in the most peripheral communities of the cities, where the socioeconomic scenario and the deficit of development are more unfavorable. In the case of patients with HAM / TSP, there is as yet no standard protocol to combat the pathology or impacts caused in the individual with the disease in clinical form. Treatment with medications associated with physiotherapeutic treatment has been the best route for the reduction of HAM / TSP disorders[1,8,13].

In the symptomatic treatment of Spasticity, the drugs contribute to the relief of the characteristic signs and symptoms[6], but in addition to appearing side effects, there are also interactions with other associated drugs used to combat symptomatic other symptoms caused by HAM / TSP. The prednisolone mentioned by Osame[16], presents drug interactions with antiemetic, used to relieve the symptoms related to nausea, nausea and vomiting, which are also freely available to patients / consumers, as well as non-steroidal anti-inflammatory drugs (NSAIDs) and in the intake of high doses of ASA[13,22]. Baclofen, one of the drugs mentioned in Table 2 and mentioned as a first-line drug used to treat spasticity [21,23,26] also presents interactions with drugs of other classes, such as levodopa and drugs that cause depression of the CNS, including muscle relaxants, opiates, synthetics or with the use of alcohol. It also presents interaction with tricyclic antidepressants, lithium-based drugs, antihypertensive and drugs that cause changes in renal function[11]. Table 03 shows the main drugs used in the treatment for spasticity in clinical cases of HAM / TSP and also the main contraindicated drugs to be administered simultaneously for causing various symptoms in patients, such as intoxication, increase or decrease in therapeutic effects, cause other pathologies or aggravation of those already existing [3-7,11-16]. As seen in table 03, there are a number of drugs, such as antihistamines, omeprazole and some muscle relaxants that do not require

over-the-counter medical prescription (MIP) and which may contribute / cause adverse effects and pharmacological interactions with other drugs, highlighted here, in the treatment of Spasticity caused by the HTLV 1 virus[1]. Drugs indicated for the treatment of neurogenic bladder, recurrent urinary tract Infection and intestinal constipation do not present interactions that present high risks of toxicity to the patient when used with over-the-counter medications. However, the recommendation is not to use the drugs listed in table 02 together with antacids or drugs that may interfere with absorption, reducing the plasma levels of the drugs[12-17]. Among the drugs used to treat neuropathic pain symptoms (spinal cord, root canals or peripheral neuropathy), most do not present drug interactions with other over-the-counter drugs, especially oral contraceptives. Antacids, which interfere with the absorption of the drugs used in the treatment. However, although they do not present interactions that cause toxic damages to the patient, pharmacological interactions with other drugs that have their sale restricted to the consumer are reported, through the dispensing of the medication with the prescription[11-15]. The importance of the pharmaceutical professional in the multidisciplinary health teams, with their technical knowledge, is increasingly evident, participating in the planning and evaluation of the pharmacotherapy to be prescribed to the patient, analyzing prescriptions and if necessary to perform pharmaceutical interventions, helping to reduce the possibilities of drug interactions and a better quality of life for patients with chronic diseases, such as those caused by the HTLV virus and other diseases[7].

**Final considerations**

The present study provided a research in which we report how the pharmaceutical professional can collaborate for a better quality of life of the HTLV virus carriers, and regarding their pharmacological treatment and their alterations in the organism. In addition, it also allowed to use several didactic resources and to evaluate these resources in the learning of the content. In general, due to lack of research and specific studies, it is not possible to detect a specific number of infected individuals in the world, as well as a precise diagnosis of this infection. In addition, there is precariousness in the public service network, where most of the time professionals are not trained, and many patients remain deprived of information and treatment, worsening their clinical condition and thereby affecting their quality of life.

With the participation of the pharmaceutical professional with the HTLV patients, it is evident its importance with the contribution of its technical knowledge, alerting and preventing against adverse, collateral, and toxic effects, where it will also be interacting from the dispensation to its treatment, thus evidencing the importance of the clinical assignments of the pharmacist. Due to the importance of the subject, it is necessary the development of projects that aim at the continued information to the HTLV patients, that can trigger improvement of their treatment, guaranteeing a better quality of life. Relieving undesired effects during the course of their infection can be avoided, and thus a differentiated pharmaceutical practice can be achieved. In this sense, the participation of the pharmacist to the population allows a process of teaching / learning in a more enriching way, motivating HTLV patients to continue the treatment in a correct way and a satisfactory life improvement.

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