Use of anti-inflammatory and analgesic drugs in an elderly population registered with a Family Health Program

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Abstract

The aim of this study was to analyze the prevalence of the use of anti-inflammatory and analgesic drugs among elderly persons from the Family Health Program in Porto Alegre, Rio Grande do Sul, and investigate associated factors such as sociodemographic and health data; continuous or as needed use of drug, drug used subject to medical prescription or self-medicated. Data collection occurred between March 2011 and December 2012. Community health workers applied a questionnaire relating to sociodemographic and health data and medication use. Non-steroidal anti-inflammatory drugs, glucocorticoids, non-opioid analgesics and opioids were evaluated. A total of 758 elderly persons were included and anti-inflammatory and analgesic drugs were used by 28.8% of the population. Acetaminophen and ibuprofen were the most frequently used drugs. Regarding self-perception of health, the worse the perception of health, the greater was the use of therapy (p<0.001). Liver disease and osteoarthritis/arthritis/rheumatism were found to be associated with anti-inflammatory and analgesic use (p<0.001). The prevalence of anti-inflammatory and analgesic use was considered moderate when compared to previous studies (28.8%). In addition, most of the elderly persons used the drugs when only needed, most probably due to feeling minor to moderate pain or because they had suffered the adverse effects of these medications in the past and so chose to use them sporadically.

Key words: Elderly. Family Health Strategy. Anti-Inflammatory Agents. Analgesics/adverse effects.

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INTRODUCTION

The increased prevalence of chronic noncommunicable diseases (CNCDs) is one of the main features of the current populational aging process.[1] Brazilian data shows that the prevalence of CNCDs is greatest among the elderly, accounting for 66.3% of pathologies, while infectious diseases and external causes represent 23.5% and 10.2%, respectively.[2]

Due to the increased incidence of CNCDs, drug use is also higher among the elderly.[3,4] A number of pharmacoepidemiological studies conducted in Brazilian cities have found that the prevalence of drug use among the elderly ranges from 70-92%, with individuals using on average between two and five medicines each.[5,6] The simultaneous use of multiple drugs may be effective for the treatment of multiple diseases, but it also increases the risk of adverse reactions, and makes continuing treatment over time difficult.[7]

Furthermore, many CNCDs contribute significantly to complaints of pain.[8] It is estimated that 80 to 85% of individuals older than 65 years have at least one significant health problem that predisposes them to pain.[9] Pain involves sensory, cognitive and emotional components, which can often be treated by non-pharmacological means through the support of a multidisciplinary team. Treatment with anti-inflammatory medications or pain relievers, however, is still the most commonly used technique.[10]

Brazilian studies report that self-medication with analgesics is a common occurrence among the elderly, as the use of such medication is related to the treatment of pain and inflammation, common symptoms for this age group.[11-13]

The American Geriatrics Society Panel on Persistent Pain among the Elderly[14] found that non-opioid analgesics are the most widely used drugs for pain management, although studies[12,14,15] have found an increase in the use of opioid analgesics in Europe and North America. Opioid analgesics provide an analgesia for moderate to severe pain, but should be used with caution as they can cause constipation, respiratory depression and dellirium.[14] For relief of pain and inflammation, nonsteroidal anti-inflammatory drugs (NSAIDs) are the most commonly used treatment in three areas: inflammatory rheumatism (rheumatoid arthritis, ankylosing spondylitis or psoriasis), osteoarthritis, and common pains, such as headache, trauma or minor tendonitis.[10] Glucocorticoids are also commonly prescribed for inflammation, especially in cases of osteoarthritis, rheumatoid arthritis and autoimmune diseases, but the prescribing of these drugs must be carefully evaluated, as they possess severe adverse effects.[10,14]

Some American and European studies suggest that oral anti-inflammatory drugs should rarely be prescribed, or should be administered with caution, when treating chronic pain in elderly patients. The use of NSAIDs among the elderly is associated with a high risk of gastrointestinal toxicity and renal failure, as well as being related to cardiovascular events and countless drug interactions.[15]

The American Geriatrics Society suggests that paracetamol should be prescribed prior to the use of oral anti-inflammatory medications. However, it is known that paracetamol possesses a toxic metabolite that can accumulate in the liver, and should therefore be prescribed in lower doses for the elderly and for patients with liver disease.[14,15]

Anti-inflammatory drugs should generally be avoided in elderly patients, especially those with peptic ulcers, chronic liver or heart disease or hypertension, and individuals using drugs with antiplatelet action, such as aspirin, corticosteroids or selective serotonin reuptake inhibitors.[16,17] Many studies have indicated that the prevalence of prescribing drugs that interact with each other for patients using anti-inflammatories is very high, and of considerable concern.[18]

Older people are major users of health services and subsequently of medication, including anti-inflammatory and analgesic

drugs. Therefore, the aim of this study was to analyze the prevalence of the use of anti-inflammatories and analgesics in a random sample of elderly persons registered with the Family Health Strategy (FHS) in the city of Porto Alegre, Rio Grande do Sul, and investigate associated factors such as: demographic and health data; continuous use of medication or used when necessary; medication recommended by doctors, or self-medicated by patient.

METHODOLOGY

The present study was part of the "Epidemiological and Clinical Study of elderly persons included in the Municipal Family Health Strategy of Porto Alegre" (EMI-SUS). EMI-SUS was a survey of a random sample of 1,080 elderly persons registered with the FHS of Porto Alegre.[19]

Data collection took place from March 2011 to December 2012. The elderly persons were invited to participate in the study, and then interviewed in their homes by Community Health Agents (CHA) who were trained specifically in data collection techniques by the project team. A questionnaire containing demographic data (age, sex, educational level, income, marital and retirement status), health (self-perception of health and diagnosed illnesses) and the use of medication by elderly persons, was used for data collection. To be included individuals had to be registered with the FHS of Porto Alegre, Rio Grande do Sul, and agree to participate in the study. Those who did not respond to the questionnaire were excluded.

Data relating to medication use was collected from the prescription of each elderly individual in the family medical records, and the drugs taken were confirmed at the elderly person's residence. In cases where an individual was unable to answer the questionnaire, the information was provided by a caregiver, with the consent of the elderly person or his or her legal representative. During qualitative analysis of individual drug consumption, CHWs recorded the trade name and active ingredients of the medication described, the daily dose taken, quantity of dosage form, duration of use (continuous or when necessary) and type of recommendation (doctor or self-medication).

Health variables were classified as self-perception of health and diseases reported by elderly persons (diabetes, cardiovascular disease, cancer, arthritis/osteoarthritis, liver disease and kidney disease). The reported diseases were identified by answering the question "Has a doctor ever told you that you have or had any of these diseases?" The pathologies were listed and explained by the CHW.

The drugs were classified by active ingredient based on the Anatomical Therapeutic Chemical classification system (ATC, as recommended by the World Health Organization (WHO)).[20] Oral use NSAIDs, glucocorticoids, non-opioid analgesics and opioid analgesics were included in the present study.[21,22] Teas and tinctures were excluded from the database and 100 mg acetylsalicylic acid and topical use anti-inflammatory medications and analgesics were not considered. Anti-inflammatory coxibs (selective inhibitors of COX-2) were also not included, as none of the patients used this class of drug.

The questionnaires were scanned and stored in a database developed by the researchers specifically for the project, using the File Maker Pro Advanced Server® software program, version 12. Data was entered in duplicate and subsequently analyzed using the statistical software program SPSS version 17. The variables were described as frequency, mean and standard deviation. Pearson's chi-square test was used to compare the frequencies of the different variables. The ordinal variables were compared using the chi-square test for linear trends. The significance level was $p<0.05$. For multivariate analysis, binary logistic regression was used, and the entry criteria for all variables was $p<0.300$. Variables with p values below 5% were retained in the final model.

The present study was approved by the Research Ethics Committee of the Pontifícia Universidade Católica do Rio Grande do Sul under registration number 10/04967 and by the Ethics Research Committee of the Municipal Health Department of Porto Alegre under registration number 001.021.434.10.07/2010. All the participants signed a Term of Free and Informed Consent.

RESULTS

This study included 758 elderly persons, 271 (35.8%) of whom were male and 487 (64.2%) of whom were female. Subjects had a mean age of 76.3±3.0 years, and the number of drugs taken was between 0 and 15, resulting in an average of 4.0±0.1. Anti-inflammatories and analgesics were used by 218 (28.8%) elderly persons, ranging from one to four medications with a mean of 1.3±0.6. Among the classes of anti-inflammatory and analgesic, 154 (70.6%) ingested non-opioid analgesics, 91 (41.7%) ingested NSAIDS, 36 (16.5%) used glucocorticoids and three (1.4%) took opioid analgesics. Paracetamol and ibuprofen were the most widely used drugs, being taken by 148 (67.9%) and 69 (31.7%) elderly persons respectively, followed by sodium diclofenac, 19 elderly persons (8.7%), prednisone, 11 elderly persons (5.0%), nimesulide, five elderly persons (2.3%), and others.

Of the sociodemographic variables, neither age group, marital status, retired status, family income nor education were found to be associated with the use of anti-inflammatories and analgesics. Female elderly persons, 154 (31.7%; p=0.022), used anti-inflammatories and analgesics with greater frequency than men.

In terms of health variables, self-perception of health was found to be related to the use of anti-inflammatories and analgesics, with the worse the health reported by the elderly person, the greater the use of medications (p<0.001). Among the disorders described, liver disease and osteoarthritis/arthritis/ rheumatism were found to be associated with the use of anti-inflammatories and analgesics, with 23 (46.0%; p = 0.004) and 121 (37.5%, p <0.001) elderly persons suffering from these conditions, respectively. It was observed that the higher the usage of medications in general, the greater the use of anti-inflammatories and analgesics (p <0.001) (Table 1).

Table 1. Distribution of sociodemographic characteristics, health and number of medications and the frequency of anti-inflammatory and analgesic use (n=758). Porto Alegre, RS, 2011-2012.

Variable	Population Distribution n (%)	Use of anti-inflammatories and/or analgesics n (%)	*p*
Age group¥			
60 to 69 years	453 (60.5)	135 (29.8)	
70 to 79 years	221 (29.5)	59 (26.7)	0.632#
80 or older	75 (10.0)	22 (29.3)	
Gender			
Male	271 (35.8)	64 (23.6)	0.022*
Female	487 (64.2)	154 (31.6)	
Marital Status¥			
Married	276 (36.8)	86 (31.2)	
Single	133 (17.7)	30 (22.6)	0.261
Widowed	230 (30.7)	65 (28.3)	
Separated	111 (14.8)	36 (32.4)	

Variable	Population Distribution n (%)	Use of anti-inflammatories and/or analgesics n (%)	*p*
Retired[¥]			
No	232 (32.1)	63 (27.2)	0.510
Yes	491 (67.9)	145 (29.5)	
Family income[¥]			
Up to 1 MS	243 (37.0)	69 (28.4)	
2 to 6 MS	401 (61.1)	128 (31.9)	0.951#
7 MS or more	12 (1.8)	0 (0.0)	
Educational level[¥]			
Illiterate/educated outside school	205 (27.3)	62 (30.2)	
Incomplete primary education	430 (57.3)	123 (28.6)	0.498
Complete primary education or more	116 (15.4)	31 (26.7)	
Self-perception of health[¥]			
Very good/good	264 (35.4)	47 (17.8)	
Fair	404 (54.2)	137 (33.9)	<0.001#*
Bad/very bad	78 (10.5)	34 (43.6)	
Liver disease[¥]			
No	638 (92.7)	171 (26.8)	0.004*
Yes	50 (7.3)	23 (46.0)	
Arthritis/arthrosis/rheumatism [¥]			
No	377 (53.9)	81 (21.5)	<0.001*
Yes	323 (46.1)	121 (37.5)	
Neurological disease[¥]			
No	423 (59.7)	118 (27.9)	0.392
Yes	285 (40.3)	88 (30.9)	
Diabetes[¥]			
No	436 (71.2)	129 (29.6)	0.318
Yes	176 (28.8)	45 (25.6)	
Cardiovascular disease [¥]			
No	159 (21.5)	40 (25.2)	0.228
Yes	579 (78.5)	174 (30.1)	
Use of medication[¥]			
Does not use medication	111 (14.7)	0 (0.0)	
1 to 3 medications	245 (32.5)	62 (25.3)	<0.001*
4 to 6 medications	241 (31.9)	71 (29.5)	
7 or more medications	158 (20.9)	85 (53.8)	
Total	758 (100.0)	218 (28.8)	

[¥]Not all elderly persons responded to this question; MS= minimum salary; #linear by linear; *p<0.05.

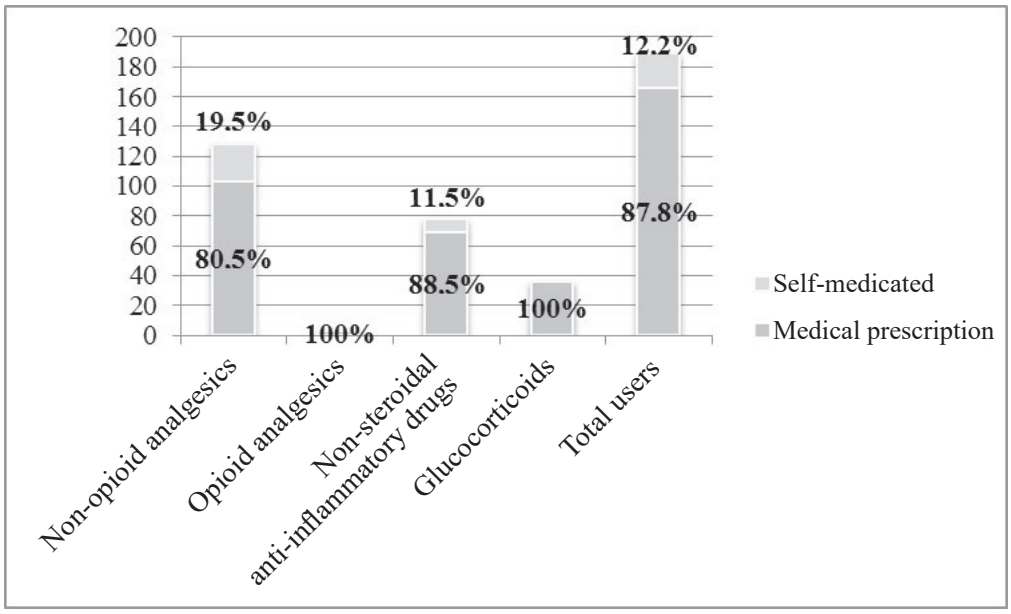
The logistic regression model confirmed that the variables fair and bad/very bad self-perception of health (p <0.001), liver disease (p=0.021) and arthritis / osteoarthritis / rheumatism (p <0.001) were independently related to the use of anti-inflammatories and analgesics (table 2).

Table 2. Independent associations between sociodemographic variables and health and the use of anti-inflammatory or analgesic drugs. Porto Alegre, RS, 2011-2012.

Variable	PR¥	CI 95%	p
Gender			
Male	1	.	.
Female	1.13	0.86-1.49	0.386
Self-perception of health			
Very good/good	1	.	.
Fair	1.75	1.27-2.40	0.001*
Bad/very bad	2.06	1.35-3.13	0.001*
Liver illness			
No	1	.	.
Yes	1.5	1.06-2.13	0.021*
Arthritis/arthrosis/rheumatism			
No	1	.	.
Yes	1.61	1.25-2.09	<0.001*

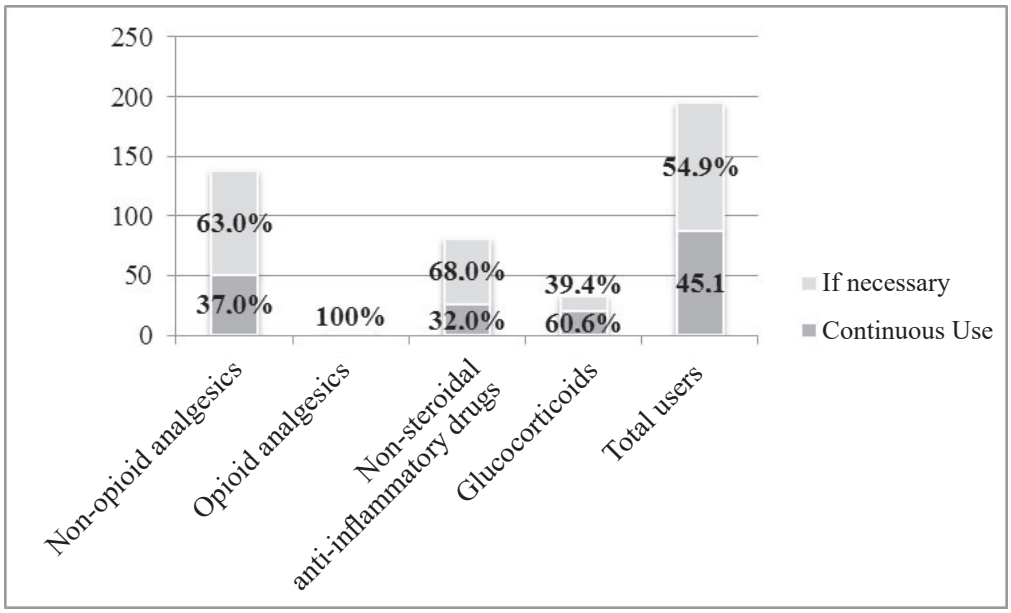
PR= prevalence ratio; CI= confidence interval; *p<0.05; ¥ binary multivariate analysis.

Figure 1 shows that most elderly persons used anti-inflammatories and analgesics via prescription. Figure 2 shows that the majority of elderly persons who used NSAIDs and non-opioid analgesics did so only when necessary.



Some elderly persons reported using more than one class of anti-inflammatory or analgesics while others did not answer this question.

Figure 1. Frequency of prescription based or auto-medicated anti-inflammatory and analgesic use. Porto Alegre, RS, 2011-2012.



Some elderly persons reported using more than one class of anti-inflammatory or analgesics while others did not answer this question.

Figure 2. Frequency of continuous or only when necessary use of anti-inflammatory or analgesic drugs. Porto Alegre, RS, 2011-2012.

DISCUSSION

The prevalence of the use of anti-inflammatories and analgesics in the present study was considered moderate (28.8%) when compared to previous studies. A study in Finland reported that 70.0% of the elderly community aged over 75 years made use of one or more anti-inflammatory or analgesic.[23] Pokela et al.[14] also studied a population of Finnish elderly persons and reported that 45.4% used anti-inflammatory drugs and analgesics. Another study in Switzerland reported that 22.0% of elderly participants used anti-inflammatories and analgesics[24] while a study of Brazilian elderly persons in Curitiba, Paraná, found that 37.0% of the study population used these drugs.[25] In a survey of elderly persons in the municipality of Santa Rosa, Rio Grande do Sul, the prevalence of anti-inflammatory and analgesic use was 11.12%.[26]

Besides the moderate use of anti-inflammatories and analgesics in the elderly population, the majority of elderly persons in the present study used medications when needed, most probably due to feeling light to moderate pain, because continuous use of medication was not necessary, or because they had suffered from the adverse effects of these medications and so chose to use them sporadically. However, a large portion of the elderly individuals used these drugs continuously. Medical guidelines for pain management indicate that painkillers and anti-inflammatories should ideally be used sporadically. When continuous use is necessary for patients with chronic pain, such use should be carefully assessed and monitored.[27,28] According to the Brazilian Clinical Protocols and Therapeutic Guidelines For Chronic Pain, treatment of such pain should comply with the scaling proposed in the WHO Analgesic Ladder, which includes the use of analgesics, followed by a combination of analgesics and anti-inflammatories, adjuvant and opioid drugs (weak and strong).[29]

It was also noted that most elderly persons investigated in the present study used prescribed drugs. The study population is part of the Porto Alegre FHS, so the drugs most used by the elderly were included on a list of medications provided free of charge in public health care facilities in the municipality, distributed subject to a medical prescription.

Paracetamol (67.9%) was the drug most frequently used by the population studied, followed by ibuprofen (31.7%). Studies conducted of elderly persons in Canada, Finland and the USA[24,30,32] between 1999 and 2008 show that NSAIDs were used more frequently than paracetamol. This change is probably due to educational programs and the publication of new guidelines regarding the appropriate management of pain and inflammation among the elderly.[33,34] NSAIDs cause many adverse effects, especially in aging bodies. A systematic review of 13 studies reported that of hospitalizations involving drugs, 11.0% involved adverse effects and overdoses related to the use of NSAIDS.[35]

Glucocorticoids were used by 16.5% of the study population. These drugs have many side effects, especially when used in large doses and for prolonged periods, as they interfere with the general metabolism of the body.[18] Only three elderly individuals (1.4%) used opoids. According to the Brazilian Clinical Protocols and Therapeutic Guidelines For Chronic Pain, opioids should be recommended to those patients who do not respond to or cannot tolerate the use of NSAIDs or simple analgesics such as acetaminophen and dipyrone.[29]

As for sociodemographic characteristics, it was noted that anti-inflammatories and analgesics were mainly used by older women. The increased use of drugs by elderly individuals has been described in numerous studies, with women typically having greater concerns about their health and seeking health services more than men.[26] In addition, it is known that the use of anti-inflammatories and analgesics is more common among women because of a higher prevalence of arthritis, osteoarthritis and rheumatism.[27,36,37]

An association between the use of anti-inflammatories and analgesics and self-perception of health was noted in the present study, with the worse the self-perception of health, the greater the use of these drugs. Anti-inflammatory and analgesic use is directly related to pain. Studies show that 51.8% of elderly people who experience pain have their activities of daily living impaired, worsening quality of life and self-perception of health.[8,9]

The use of anti-inflammatories and analgesics was associated with seniors who reported suffering from liver disease. This is worrying, as the use of these drugs should be treated with caution in patients with liver problems. Paracetamol is one analgesic that can lead to increased hepatotoxicity. Paracetamol dosage in the elderly should be individualized, as it is more difficult for aged bodies to eliminate the active metabolite of paracetamol, causing greater liver damage, especially in patients in whom this organ is already impaired.[27] The use of anti-inflammatories and analgesics was also associated with elderly persons who reported having arthritis, arthritis or rheumatism. It is known that current guidelines recommend the use of paracetamol as the analgesic of choice for mild to moderate pain caused by osteoarthritis of the knee and hip.[15] In patients for whom acetaminophen does not contain adequate analgesia or has little anti-inflammatory effect, NSAIDs are recommended.[38]

Polypharmacy was directly linked to the use of anti-inflammatories and analgesics. The increased consumption of such medications follows the trend of population aging, and is normal practice in medical clinics. However, the introduction of an increasing number of pharmaceutical specialties and different therapies has resulted in frequent problems associated with pharmacotherapy (such as adverse effects, drug interactions, misapplication, and improper handling) and also greater concerns connected with pathological processes and the physiological changes of the aging process.[25] Therefore, the use of anti-inflammatories and analgesics should be thoroughly evaluated before these drugs are prescribed, as they have numerous adverse effects on the elderly body and a range of drug interactions.

The main limitations of this study relate to the information reported by the elderly persons or caregivers at the time of the questionnaire interview. A great deal of information, such as the use of drugs and related diseases, was conferred from the medical records of the individual by the CHW. However, some records were incomplete, and at times did not contain the necessary information.

CONCLUSION

The results of the present study identified the moderate use of anti-inflammatory and analgesic drugs by elderly users of the Family Health Strategy in the city of Porto Alegre, Rio Grande do Sul, Brazil. The majority of those who used medication were women, and most drugs were made available by prescription. In addition, it was found that age, marital status, retirement status, family income and educational level were not associated with the use of anti-inflammatories and analgesics. Most elderly persons reported that they used these drugs only when necessary, probably due to feeling light to moderate pain, or because the continuous use of medication was unnecessary. In the present study an association was observed between the use of anti-inflammatories and analgesics and self-perception of health, with the worse the perception of health, the greater the use of these medications.

There was also an association between anti-inflammatory and analgesic use and reports of liver disease, which raises the concern that the medical professional prescribing the medication may not be enquiring about the presence of such condition, or that the condition is being caused by excessive use of painkillers, particularly paracetamol.

Studies such as this are important, as they can be used as a tool for the reorientation of pharmaceutical treatment. Identifying the

characteristics and factors associated with the consumption of drugs by elderly Brazilians can assist in the planning of strategies to promote a more rational use of medications and hence lead to a better quality of life for this age group, as well as contributing to a reduction in unnecessary spending on such treatments by the health system.

Ensuring effective and rational drug therapy for the elderly population is a task that involves all health professionals, including doctors, pharmacists, and nurses, who should be attentive to the individual characteristics of the elderly persons, and recommend the best course of treatment for these patients.

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