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Original Research Article

Feasibility of the Implementation of LESS-CHRON in Clinical Practice: A Pilot Intervention Study in Older Patients With Multimorbidity

Marta Mejías-Trueba, PharmD,[1,2] Aitana Rodríguez-Pérez, PharmD,[1,*] Carlos Hernández-Quiles, MD,[3] Manuel Ollero-Baturone, MD,[3] María Dolores Nieto-Martín, MD,[3] and Susana Sánchez-Fidalgo, PharmD[4]

[1]Department of Pharmacy, University Hospital Virgen del Rocio, Seville, Spain.
[2]Department of Infectious Diseases, Microbiology and Preventive Medicine, Infectious Diseases Research Group, Institute of Biomedicine of Seville (IBiS), University of Seville/Spanish National Research Council/University Hospital Virgen del Rocio, Seville, Spain.
[3]Department of Internal Medicine, University Hospital Virgen del Rocio, Seville, Spain.
[4]Department of Preventive Medicine and Public Health, University of Seville, Sevilla, Spain .

*Address correspondence to: Aitana Rodríguez-Pérez, PharmD, Department of Pharmacy, University Hospital Virgen del Rocio, Avenida Manuel Siurot s/n, Seville 41013, Spain. E-mail: aitanarp@gmail.com

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Abstract

Background and Objectives: Potentially inappropriate medication refers to the prescription of drugs whose risks outweigh the benefits. There are different pharmacotherapeutic optimization strategies to detect and avoid potentially inappropriate medications (PIMs), namely deprescription. The List of Evidence-Based Deprescribing for Chronic Patients (LESS-CHRON) criteria were designed as a tool to systematize the deprescribing process. LESS-CHRON has established itself as one of the most suitable to be applied in older (≥65 years) multimorbid patients. However, it has not been applied to these patients, to measure the impact on their treatment. For this reason, a pilot study was conducted to analyze the feasibility of implementing this tool in a care pathway.

Research Design and Methods: A pre–post quasi-experimental study was conducted. Older outpatients with multimorbidity from the Internal Medicine Unit of a benchmark Hospital were included. The main variable was feasibility in clinical practice, understood as the likelihood that the deprescribing intervention recommended by the pharmacist would be applied to the patient. Success rate, therapeutic, and anticholinergic burden, and other variables related to health care utilization were analyzed.

Results: A total of 95 deprescribing reports were prepared. Forty-three were evaluated by the physician who assessed the recommendations made by pharmacists. This translates into an implementation feasibility of 45.3%. The application of LESS-CHRON identified 92 PIMs. The acceptance rate was 76.7% and after 3 months 82.7% of the stopped drugs remained deprescribed. A reduction in anticholinergic burden and enhanced adherence was achieved. However, no improvement was found in clinical or health care utilization variables.

Discussion and Implications: The implementation of the tool in a care pathway is feasible. The intervention has achieved great acceptance and deprescribing has been successful in a not insignificant percentage. Future studies with a larger sample size are necessary to obtain more robust results in clinical and health care utilization variables.

Translational Significance: This study analyses the feasibility of implementing the LESS-CHRON deprescribing tool in a care pathway for older outpatients with multimorbidity. This is a pilot study in which the bases are established to implement a multidisciplinary care circuit in which pharmacotherapeutic optimization is addressed. This claim is included in a consensus on the care process to follow for this type of patients throughout our autonomous community, which could translate into political benefits. This tool has been created and implemented based on evidence clearly pointing to the importance of establishing a systematic deprescribing strategy as part of the patient-centered model.

Key words: Deprescribing, Feasibility, LESS-CHRON, Multimorbidity, Older adults, Polymedicated

Potentially inappropriate medication (PIM) refers to the prescription of drugs whose risks outweigh the benefits (1). Such a scenario is common in older multimorbid patients, where sometimes the duration or frequency of medication is higher than recommended, and there is duplication and nonuse of indicated medications (2). Appropriate prescribing should be based on the clinical and functional situation of the patient, as well as their prognosis, life expectancy, and therapeutic

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goals (3). Numerous studies estimate the prevalence of PIMs among the older population to be approximately 50% (4). Furthermore, PIMs have been associated with increased comorbidities and even higher mortality, leading to both complications during hospital stays and an increase in the duration and cost of these stays (5).

Various pharmacotherapeutic optimization strategies exist to detect and avoid PIMs, thereby improving patient safety. Current international trends in the management of multimorbid patients seem to have reached consensus on the relevance of patient-centred care (PCC) (6). This model combines pharmacotherapeutic optimization interventions with a multidisciplinary and patient-responsive approach.

To achieve a multidisciplinary approach, the design of an individualized therapeutic plan is key. In this plan, it is essential to integrate pharmacists as part of the multimorbid patient assessment team. Their professional input in reviewing medication has been shown to successfully reduce medication-related issues. Secondarily, it prevents health problems caused by drugs and reduces health care costs (7). A key strategy for pharmacotherapy optimization is deprescribing. This activity is defined as a process of review and evaluation of long-term therapeutic plans, which allows for discontinuation, replacement, or dose modification of drugs that were appropriately prescribed, but which, under certain clinical conditions, may be considered unnecessary or have an unfavorable benefit–risk ratio (8). These drugs fall within the category of PIMs. The deprescribing process should also have a PCC approach, allowing patients to participate in decision-making related to their treatment (9,10). Studies have shown that their active participation translates into additional benefits in terms of satisfaction, doctor–patient relationship, adherence, and health outcomes (11,12).

In line with the earlier, in 2017, the List of Evidence-Based Deprescribing for Chronic Patients (LESS-CHRON) criteria were created to standardize the deprescribing process. This tool was designed by a multidisciplinary team made up of hospital and primary care pharmacists, internists, and family physicians (13). It consists of a list of 27 criteria, each of which represents a drug and what it is indicated for, as well as the clinical conditions that must be met for deprescribing to be considered. It also includes information on health variables to be monitored and appropriate follow-up time to ensure the safety of the process. It is integrated into a platform of pharmacotherapeutic optimization tools for chronic patients, which allows for the preparation of reports and facilitates their application in clinical practice (14).

Although the usefulness of the LESS-CHRON tool was evaluated in an inter- and intraobserver reliability study (15), its feasibility has not yet been analyzed and its validation in clinical practice has not yet been carried out. This can be explained by the fact that, despite the benefits that have been achieved with deprescribing, there are still limitations that hinder its implementation in clinical practice (16). However, recent international studies have positioned the LESS-CHRON tool as one of the most suitable for use in older patients in clinical practice, due to its rigorous methodology and its intrinsic characteristics (17,18).

The main objective of this study was to analyze the feasibility of implementing the LESS-CHRON tool in a care pathway for older outpatients with multimorbidity. This objective is based on the importance of establishing a systematic deprescribing strategy as part of the PCC model. Secondary objectives are to analyze the barriers and limitations of the process before its full integration into the care pathway and to describe the health outcomes obtained after its final application.

Method

Setting and Study Design

A pre–post quasi-experimental study was carried out in the Internal Medicine outpatient day clinic in a benchmark University Hospital located in Sevilla, Spain. The intervention was carried out by a multidisciplinary team composed of hospital pharmacists and internists. The duration was from October 2020 to January 2022.

Throughout the intervention period, the physicians treating the participating patients followed clinical practice standards.

The study was approved by the Ethics Committee of Virgen Macarena-Virgen del Rocío University Hospitals (LESSTOP-Project).

Participants

Eligible participants were older patients (≥65 years) that were chronically polymedicated (five or more drugs for more than 3 months). They experienced multimorbidity according to the definition standardized by the Regional Ministry of Health (19) and were under follow-up in the Internal Medicine outpatient clinic, which they attended with varying frequency depending on their clinical needs. Furthermore, they had a prescription for at least one of the drugs listed in the LESS-CHRON criteria for the indication specified in the tool. Informed written consent was obtained for each participant.

Patients with active, nonstabilized malignant neoplasia and disseminated metastasis, as well as patients with neurological or mental disability without a legal representative or in a clinical situation of active dying, were excluded.

Intervention

Three hospital pharmacists and five internists with experience in the field of deprescribing developed a multidisciplinary intervention protocol. For each patient, the intervention started at the baseline visit with their treating physician and continued throughout the follow-up period (6–12 months).

The pilot study was conducted in 2 simultaneous phases (Supplementary Figure 1): a first exploratory or screening phase and a second phase consisting of the intervention itself. In the exploratory phase, the pharmacy team identified candidates for inclusion based on previously defined inclusion criteria. Next, a pharmacist independently evaluated the PIM identified by LESS-CHRON for each patient. That is, the pharmacist exhaustively reviewed the patient's clinical history to identify any of criteria (the drug–clinical condition binomials for deprescribing) described in the tool to detect medications that should be avoided in that patient (PIM). Subsequently, a deprescribing report was prepared based on the application of the LESS-CHRON criteria (Supplementary Material 2). Suggestions were also included regarding monitoring parameters and the follow-up time needed to assess the efficacy of deprescribing based on the tool's indications.

This report was sent to the treating physician to implement the intervention phase. Interventions were considered feasible when the internist assessed the report of recommendations, completing the review of the history that had previously begun with a clinical interview. They then made a decision

whether to implement the proposed deprescribing based on their subjective assessment, the pharmacist's recommendations, and the patient's clinical situation (acceptance rate). If the deprescribing was not carried out, the drugs were considered PIMs that were not accepted by the internist.

Three months after the intervention, the first follow-up visit took place to assess the deprescribing success, that is, whether or not the patient needed to have the deprescribed drug(s) reintroduced. This decision was made based on the internist's clinical judgment and the analytical parameters requested. To conclude the study, starting 6 months after the intervention, potential changes in clinical and health care utilization variables were analyzed.

Data Collection and Study Variables

Data were collected from the digital clinical station (DIRAYA) and the electronic prescription program in the Receta XXI module, corresponding to the patients' individual health card. All variables studied were stored in an electronic data collection notebook (RedCap) developed by the Spanish Society of Hospital Pharmacy.

The main variable was feasibility in clinical practice, understood as the likelihood that the intervention recommended by the pharmacist using the deprescribing tool would be applied to the patient. This means that the final treatment provider had to assess the recommendation and consider implementing the revised care plan. Feasibility was calculated by dividing the number of patients who had a report read and assessed by the internist, by the number of patients with a report prepared by the pharmacist team.

In addition, the following secondary variables were analyzed:

- Sociodemographic: sex, age, multimorbidity, and comorbidity criteria.
- Related to pharmacological treatment: number of drugs prescribed at the time of inclusion and number of PIMs.
- Clinical: self-perception of health, Pfeiffer Questionnaire, Barthel Index, Profund Index, Charlson Index and Frail-VIG index. The Profund Index makes it possible to calculate the risk of mortality at one year in multimorbid patients.

In addition, the following secondary variables were analyzed only for the patients whose intervention was feasible:

Related to pharmacological treatment:

1. Number of potentially applicable LESS-CHRON criteria.
2. Pharmacological group (Anatomical Therapeutic Chemical) to which the identified PIMs and active substances belong.
3. Acceptance rate (per PIM), understood as the percentage between the number of PIMs applied versus the number of PIMs suggested. This was also calculated on a per patient basis.
4. Barriers to deprescribing, which are the reasons for deciding not to stop the suggested PIMs. This was collected by conducting interviews with clinicians or based on what they would have reflected in the patient's medical history.
5. Deprescribing success rate, referring to the total number of drugs not requiring reintroduction to a patient three months after deprescribing, divided by the total number of drugs initially deprescribed.
6. Reasons for reintroduction of deprescribed drugs.
7. Therapeutic burden reduction rate, which is the total number of drugs that are finally deprescribed divided by the total number of drugs prescribed at the baseline.
8. Variations in adherence and anticholinergic burden three months after the intervention were measured by the Morisky–Green test and the Drug Burden Index scale, respectively.

Other

Changes in clinical and health care utilization variables from baseline (6–12 months after baseline visit): Profund Index, Barthel Index, Pfeiffer Questionnaire, self-perception of health, number of unplanned admissions, days of hospitalization, number of emergency department visits, number of falls, and mortality.

Statistical Analyses

Sample size

The sample size estimate was calculated to obtain statistically significant differences in the main variable.

Using a 2-way χ^2 test for two independent samples, with a 95% confidence interval (CI; 5% alpha significance level) and a 10% beta error margin (90% power) with the actual value and estimating the feasibility rate based on results referring to similar variables in the literature of 60% (20), it was deemed necessary to include 93 patients for whom a deprescribing report would be prepared.

Analysis of variables

Quantitative variables are described through medians and quartiles in the case of asymmetric distributions, although qualitative variables are described through frequencies and percentages. For each statistical value obtained in the sample, the confidence interval of the population value was obtained.

Numerical variables between groups were compared by applying the nonparametric Mann–Whitney *U* test. Associations between qualitative variables were assessed by making contingency tables and applying the chi-square test.

Correlations between numerical parameters were analyzed by calculating Pearson's or Spearman's linear correlation coefficients. To analyze the temporal evolution, the nonparametric Wilcoxon test was applied for quantitative or ordinal variables, as well as McNemar's test for categorical variables.

All statistical tests were based on a type I error of 5% and a minimum power of 80%. Data analyses were performed using the statistical software RStudio version 1.2.5019.

Results

A total of 95 patients who met the inclusion criteria were identified, for whom a deprescribing report was prepared. Finally, 43 patients were assessed by their treating physician, analyzing the recommendation made by the pharmaceutical team after applying LESS-CHRON, and completing the clinical interview. Thus, the resulting feasibility of implementing the deprescribing strategy in clinical practice was 45.3% (Figure 1).

The demographics of patients for whom the intervention was feasible (intervened) (n = 43) were analyzed against the

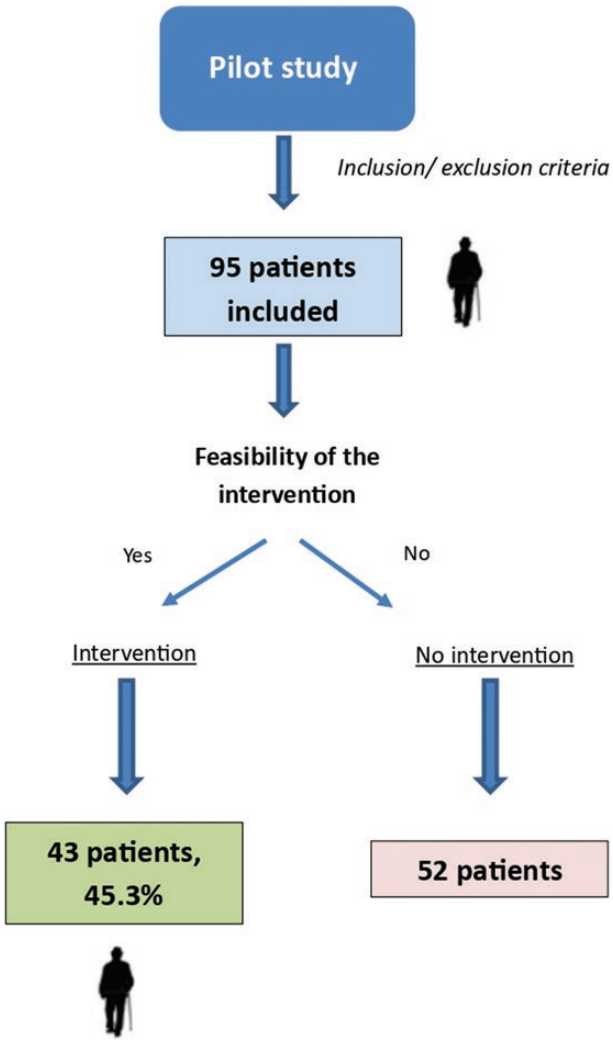

Figure 1. Participant flow.

patients for whom it was not (n = 52). Demographics were also analyzed based on clinical and pharmacological treatment-related variables. No statistically significant differences were found between both groups (Tables 1 and 2).

All the results presented below refer to the 43 patients who were finally intervened during the intervention phase. The results of the potential application of the tool in the cohort (screening phase) are published elsewhere (21).

The most prevalent comorbidities were hypertension (90.7%), dyslipidaemia (62.8%), atrial fibrillation (51.2%), uncomplicated diabetes mellitus (39.5%), thromboembolic disease (27.9%), and chronic obstructive pulmonary disease (25.6%).

The intervened cohort was prescribed a total of 666 active substances, with a median of 15 (interquartile range [IQR] 6.5) drugs prescribed at baseline. The application of LESS-CHRON allowed identification of 92 PIMs. This represents a mean of 2.14 PIMs/patient.

After physician assessment, 52 drugs of the 92 PIMS were deprescribed. This translates into an acceptance rate of 56.5% CI 95% (46.4–66.7). The acceptance rate per patient was higher because out of the 43 patients included, only 10 decided not to stop any medication: 76.7% CI 95% (64.1–89.4).

Lastly, barriers to stopping medications were evaluated. The main reasons for not stopping drugs (n = 40) were: decision of the physician, considering that the drug was necessary for the patient's clinical situation: 61.5% (n = 24); patient or family refusal to stop the medication: 23.1% (n = 9); the drug had been prescribed by a different specialist: 7.7% (n = 3); another drug had already been deprescribed for the same indication: 5.1% (n = 2); there was no record: 2.6% (n = 1).

After 3 months, 9 of the 52 deprescribed drugs had to be reintroduced, so the deprescribing success rate was 82.7%. The main reason for reintroduction (n = 7) was the onset of new symptoms related to what the drug was prescribed for. In one other case, the patient continued to take the drug by choice, although in the remaining case, the drug was reintroduced by a physician who was not participating in the study.

At the end of the follow-up, a total of 43 drugs out of the 92 initially proposed had been deprescribed (46.7%). Thus, the therapeutic burden was reduced by 6.5% (43 drugs finally deprescribed/666 total drugs prescribed at baseline), which translates into a reduction of the median of regular medication from 15 (IQR 12.5–19) at the baseline to 14 (IQR 12–17.5) at the end of the intervention, p = .97.

The deprescribing process for the different pharmacological groups is shown in Table 3. Supplementary Table 1 shows these results broken down by active substances.

Assessment of Pharmacological Variables During Follow-Up

Variations in adherence and anticholinergic burden figures were analyzed 3 months after the start of the study. Regarding adherence at baseline, of the 43 patients who were intervened, 35 were adherent compared with 8 who were nonadherent. When reinterviewed at the follow-up visit (at 3 months), 96.7% of the patients remained adherent, while of the 8 patients who were not initially adherent, 3 had become adherent; p < .002.

Of the 33 patients for whom drugs were deprescribed, 30 were adherent compared with 3 nonadherent patients. At 3 months, 96.4% of the patients were still adherent and 100% had become adherent; p = 1.

Regarding anticholinergic burden, the results showed a reduction, with a baseline figure of 1.06 (IQR 1.03) and a value of 0.67 (IQR 0.61); p < .001.

Assessment of Clinical and Health Care Utilization Variables During Follow-Up

At the end of the study, 23.3% (n = 10) of the patients had died. Therefore, it was not possible to analyze data on clinical and health care utilization variables for these patients.

The Profund median for the total number of patients included at baseline was 6 (IQR 6), compared with 5 (IQR 6) at the end of the study; P = .203. Regarding the Barthel Index, the median was 85 (IQR 35) at baseline and 70 (IQR 45) at the end of the study; P = .0216. Regarding the Pfeiffer Questionnaire, the median at baseline was 0 (IQR 1) errors and after at least 6 months, it was 1 (IQR 3) error; p = .180.

As for self-perception of health, it remained the same from baseline to the end of the study: 3 (IQR 2); p = .169.

Finally, for the clinical variable number of falls, the median registered was 0 (IQR 1) in the months prior to the start of the study and also 0 (IQR 0.75) during the study; p = .284.

Table 1. Baseline Demographics of the Patients in the Analysed Cohort

Baseline Demographics	Total (n = 95)	Intervened (n = 43)	Nonintervened (n = 52)	p Value
Age in years	79 (9.5)	79 (11.0)	79.5 (8.0)	.811
Sex				.410
Woman	45 (47.4)	18 (41.9)	27 (51.9)	
Man	50 (52.6)	25 (58.1)	25 (48.1)	
Primary caregiver				.150
Yes	49 (75.4)	22 (66.7)	27 (84.4)	
No	16 (24.6)	11 (33.3)	5 (15.6)	
Multimorbidity criteria (19)				
A1. Heart failure, NYHA Class II	58 (61.1)	28 (65.1)	30 (57.7)	.529
A2. Ischemic heart disease	34 (35.8)	16 (37.2)	18 (34.6)	.832
B1. Vasculitis and autoimmune diseases	7 (7.4)	4 (9.3)	3 (5.8)	.698
B2. Chronic kidney disease, GFR < 60 mL/min or albumin creatinine index > 30 mg/g	47 (49.5)	27 (62.8)	20 (38.5)	.024
C1. Chronic respiratory disease presenting with MRC grade 2 dyspnea or FEV1 < 70% or sat O_2 ≤ 90 in stable condition	35 (36.8)	17 (39.5)	18 (34.6)	.673
D1. Inflammatory bowel disease	1 (1.1)	0 (0)	1 (1.9)	.999
D2. Chronic liver disease with hepatocellular insufficiency or portal hypertension	6 (6.3)	3 (7.0)	3 (5.8)	.999
E1. Stroke	23 (24.2)	11 (25.6)	12 (23.1)	.813
E2. Neurological disease with permanent motor deficit (Barthel Index < 60).	19 (20.0)	6 (14.0)	13 (25.0)	.207
E3. Neurological disease with persistent, at least moderate cognitive impairment	11 (11.6)	3 (7.0)	8 (15.4)	.335
F1. Symptomatic peripheral arterial disease	9 (9.5)	5 (11.6)	4 (7.7)	.727
F2. Diabetes mellitus with proliferative retinopathy or symptomatic neuropathy	19 (20.0)	8 (18.6)	11 (21.2)	.802
G1. Chronic anemia due to digestive losses or acquired hemopathy not amenable to curative treatment	40 (42.1)	20 (46.5)	20 (38.5)	.532
G2. Active solid or hematological neoplasm not amenable to curative treatment	10 (10.5)	5 (11.6)	5 (9.6)	.751
H1. Chronic osteoarticular disease resulting in limitation of the patient's ability to move around	2 (2.1)	0 (0)	2 (3.8)	.499
H2. Osteoporotic hip fracture	1 (1.1)	0 (0)	1 (1.9)	.999

Notes: FEV1 = forced expiratory volume in 1 second; GFR= glomerular filtration rate; MRC = Medical Research Council; NYHA = New York Heart Association. Quantitative variables are expressed as a number (percentage) or median (interquartile range).

Table 2. Clinical and Pharmacological Variables of the Patients in the Cohort

Variable	Total (n = 95)	Intervened (n = 43)	Nonintervened (n = 52)	p Value
Clinical variables				
Charlson Index	2 (1.8)	2 (2.0)	2 (1.5)	.723
Barthel Index	75 (35)	85 (35)	75 (35)	.314
Profund Index	6 (6.8)	6 (6.0)	8 (6.0)	.212
Pfeiffer Questionnaire	0 (1.0)	0 (1.0)	0 (1.5)	.432
Frail-VIG Index	0.36 (0.2)	0.36 (0.2)	0.36 (0.2)	.419
Variables related to pharmacological treatment				
Number of drugs prescribed (baseline)	14 (5.0)	15 (6.5)	14 (5.0)	.121
Number of potentially inappropriate medications/patient	2 (2.0)	2 (2.0)	2 (1.3)	.454

Notes: Quantitative variables are expressed as a number (percentage) or median (interquartile range).

Table 4 shows the results of analyzing the earlier clinical variables in the patients who were deprescribed at least one drug (n = 33) versus those who were not (n = 10).

We also analyzed the number of hospitalizations in the months prior to the start of the study and during its course, obtaining a median of 0 (IQR 1) admissions in both cases; p = .168. The same analysis was performed for the number of visits to the emergency department, with a median of 0 (IQR 1) visits; p = .096. These data were also analyzed dividing patients according to whether they had been deprescribed any medication, with no differences between groups for any of the health care utilization variables.

Discussion

To the best of our knowledge, this is the first study to analyze the feasibility of implementing a deprescribing strategy based on the LESS-CHRON tool, applying it to older multimorbidity outpatients, in a clinical practice setting.

It was feasible to recruit patients for a pharmacist-led multidisciplinary deprescribing intervention in outpatients with multimorbidity. Of the 95 patients who met the inclusion criteria and had a deprescribing report prepared, 45.3% (n = 43) responsible physicians reviewed reports. Thus, incorporating this procedure as part of the care activity favored deprescribing in this group of patients, where 46.7% of the PIMS identified were successfully stopped. This is in line with another study with a similar design and sample size that achieved 52% (22).

The implementation of this pathway consolidated the physician–pharmacist relationship and revealed how this tool can function when integrated as a strategy to assist in the deprescribing process. This in turn helped to systematize the process of reviewing patients' pharmacotherapy. Both aspects are considered key to the PCC model (23). Furthermore, carrying out a comprehensive geriatric assessment and completing the process with a clinical interview with the patient encourages shared decision making. All of this enhances PCC, thus favoring the individualization of pharmacotherapeutic plans.

It is worth noting that the nonintervention of patients was apparently not caused by defects in the pathway implemented or to the refusal of participating physicians to deprescribe. We also analyzed the different variables that could influence patient inclusion (sociodemographic, clinical, and pharmacological) and did not find any significant difference, except for the "chronic kidney disease" category of the multimorbidity criteria, but this appears to be attributable to chance. Therefore, the independence of the intrinsic characteristics of each individual was confirmed. However, this alone may not be sufficient to completely rule out other possible contributing factors. Thus, clinicians suggested that the SARS-CoV-2 pandemic played a role in the lack of intervention. It should be borne in mind that the recruitment took place in the midst of the pandemic and, specifically, Internal Medicine was one of the units most strongly involved in the management of COVID patients. However, further research may be needed to fully understand the factors associated with feasibility.

Regarding the results related to the intervention, the overall acceptance rate per patient was 76.7%, with a 95% CI of 64.1%–89.4%, which is highly significant. This figure was higher than that obtained in the studies found with a similar design, which achieved 65% and 70%, respectively (22,24). The acceptance rate per drug in our study was 56.5%, higher

Table 3. Deprescribing Success by Pharmacological Group

ATC Group	Number of Drugs (n = 92)	Total Number of Drugs		Drugs Reintroduced (n = 9)	Overall Success (n = 43)
		Drugs Not Stopped (n = 40)	Drugs Deprescribed (n = 52)		
A10: Oral antidiabetics	6 (6.5)	3 (7.5)	3 (5.8)		50.0
A11: Vitamins	1 (1.1)	0	1 (1.9)		100.0
A12: Mineral supplements	3 (3.3)	0	3 (5.8)	1 (11.1)	66.7
B01: Antithrombotic	3 (3.3)	2 (5.0)	1 (1.9)		33.3
C02: Antihypertensives	4 (4.3)	2 (5.0)	2 (3.8)		50.0
C03: Diuretics	1 (1.1)	0	1 (1.9)		100.0
C08: Calcium channel blockers	1 (1.1)	1 (2.5)	0		0
C10: Statins	8 (8.7)	2 (5.0)	6 (11.5)	1 (11.1)	62.5
G04: Urological	12 (13.0)	8 (20.0)	4 (7.7)	1 (11.1)	25.0
M04: Antigout agents	8 (8.7)	1 (2.5)	7 (13.5)	2 (22.2)	62.5
M05: Bone disease drugs	1 (1.1)	0	1 (1.9)		100.0
N05: Psycholeptic	29 (31.5)	16 (40.0)	13 (25.0)	3 (33.3)	34.5
N06: Psychoanaleptic	15 (16.3)	5 (12.5)	10 (19.2)	1 (11.1)	60.0

Notes: ATC = Anatomical Therapeutic Chemical. Quantitative variables are expressed as a number (percentage).

Table 4. Comparison of Results of Clinical Variables at Baseline Versus the End of the Study (6 Months Post-DP)

Clinical Scale		No Drug Deprescribed (n = 10)	At Least One Drug Deprescribed (n = 33)	Total (n = 43)	p Value
Profund	Baseline	5.5 (4)	6.0 (6)	6 (6)	.738
	Final	5.0 (4)	5.5 (6)	5 (6)	.721
Barthel	Baseline	75 (35)	85 (30)	85 (35)	.377
	Final	75 (15)	70 (56)	70 (45)	.823
Pfeiffer	Baseline	0 (1.0)	0 (1.3)	0 (1)	.681
	Final	2 (5.0)	1 (2.3)	1 (3)	.499
Self-perception	Baseline	2 (2.3)	3 (1.5)	3 (2)	.331
	Final	3 (1)	3 (2.0)	3 (2)	.486
Number of falls	Baseline	0 (1)	0 (1)	0 (1)	.726
	Final	0 (0)	0 (1.0)	0 (0.8)	.681

Note: DP = deprescribing proposal. Quantitative variables are expressed as median (interquartile range).

than that achieved by Cross et al. (22), in whose study 42.7% of drugs had been ceased or dose-reduced at 6 months. The greater acceptance achieved in our study may be due to different factors. The main one is associated with the suitability of the criteria included in the LESS-CHRON tool. As previously mentioned, the tool was designed for older patients with multimorbidity, following a rigorous methodology and being subsequently validated. For this reason, we consider that the deprescribing opportunities offered by the tool are very well adjusted to the target population. Secondly, the recommendation was made through the preparation of an individualized and detailed report for each patient, which clearly explained the benefits of drug withdrawal. Finally, there was good coordination at the team level and in the established circuit.

Only 9 out of 52 drugs required reintroduction at 3 months, which represents a deprescribing success of 82.7%, close to other authors with 81% (24,25). However, in the study by Whitty et al. (25), of the 102 medications stopped after discharge, they were able to assess the status of only 36, lowering the deprescribing success. A reduction in the number of regular medicines close to that obtained in a similar study (24) was also achieved.

In our study, the most frequently proposed pharmacological groups to be deprescribed by pharmacists were psycholeptics (antipsychotics, anxiolytics and hypnotics, and sedatives), psychoanaleptics (antidepressants and psychostimulants), and urological preparations. However, only psychoanaleptics achieved an acceptance rate by physicians of more than 50% and could be successfully stopped in 60% of cases. It is worth highlighting those pharmacological groups that, despite their lower prevalence, achieved a higher acceptance rate, as well as greater success in the intervention (mineral supplements, statins, and antigout agents). Moreover, it is important to assess certain results with caution, considering that even though the success rate ranged between 0

and 100% in some cases, this figure refers to a single active substance within the medication (vitamins, diuretics, calcium antagonists). In comparison with other published work, the potential pharmacological groups to be deprescribed do not differ widely, although there is variability in their prevalence (26,27).

As for the pharmacological variables and health outcomes analyzed, this study was not designed to identify changes in these variables. However, this sampling allowed us to assess the feasibility of analyzing these variables and using them in future studies.

With regard to the pharmacological variables analyzed, there was a clear reduction in the anticholinergic burden, showing similar results to the study by Petersen et al. (28). This is of great relevance because previous studies have shown that an increase in anticholinergic burden is closely related to a greater occurrence of adverse effects, mainly associated with the central nervous system (29,30). In contrast, the improvement in adherence is difficult to assess based on the data obtained. Although patients with a deprescribed drug had increased adherence by 42.9% at follow-up, this figure should be viewed with caution given the low number of participants in the study.

Finally, in terms of clinical and health care utilization variables, no changes were identified after deprescribing. As previously mentioned, these results were to be expected due to the limited sample size and are in line with other similar studies (24).

Limitations of this study include its conduct during the SARS-CoV-2 pandemic and the lack of proactivity on the part of physicians in patient selection. Both aspects had a clear impact on the feasibility of the intervention. Finally, a larger sample size is needed to obtain accurate results on clinical and health care utilization variables, although as mentioned, the aim of this study was to analyze feasibility and these types of studies use similar sample sizes (22,24,27). In addition, a multicenter study has been launched to analyze the impact on the reduction of pharmacotherapy along with the other variables, which will shed more light on the benefits of the application of the LESS-CHRON tool.

This study demonstrates that the implementation of the LESS-CHRON tool in a care pathway is feasible, despite the adverse context of a pandemic. The intervention has achieved great acceptance and deprescribing has been successful in a not insignificant percentage. Although the results for health and health care utilization variables have been less robust, a multicenter study, involving more than 30 hospitals, has been launched with the aim of providing more information regarding these variables. The results obtained in this work will represent an advance in the management of these patients, who constitute a challenge for current health systems.

Supplementary Material

Supplementary data are available at *Innovation in Aging* online.

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Conflict of Interest

None declared.

Ethical Approval and Consent to Participate

All methods were carried out in accordance with relevant guidelines and regulations. The study was approved by the Ethics Committee of Virgen Macarena-Virgen del Rocío University Hospitals (LESSTOP-Project). Informed written consent was obtained for each participant.

Consent for Publication

Not applicable.

Data Availability

The data sets generated and/or analyzed during the current study are not publicly available as they are part of a research project that includes information that is being analyzed, but are available from the corresponding author on reasonable request.

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