

Changes in psychotropic drug use among patients in the cognitive behavioural care unit in Toulon

Évolution de la consommation de psychotropes des patients hospitalisés à l'unité cognitivo-comportementale de Toulon

ROMAIN VAN OVERLOOP¹
LAURIANE CAMPSEVEUX¹
SYLVIE ARLOTTO²

¹ Unité cognitivo-comportementale,
Centre hospitalier
Toulon-La-Seyne-sur-mer, La Garde,
France

² Service d'évaluation médicale,
Aix-Marseille université, APHM,
Marseille, France

Correspondance : R. Van Overloop
<romainvano.csc@gmail.com>

Abstract. Behavioural and psychological symptoms of dementia (BPSD) are common and form part of the evolution of the disease. Specialised cognitive behavioural units were created in France to improve the care of patients with dementia. The main aim of this study was to describe changes in the use of psychotropic drugs in these units between admission and discharge. The second aim was to compare prescriptions from two physicians. Method: This was a descriptive, retrospective, monocentric study conducted between May 2016 and May 2018. Results: Psychotropic drug use was stable with regard to the 123 patients studied. The level of prescription of antipsychotic agents, acetylcholinesterase inhibitors and memantine was lower at discharge ($p < 0.05$), while the level of prescription of hypnotic benzodiazepines and antidepressant agents was higher ($p < 0.05$). Both physicians made similar prescriptions, with the exception of the concomitant prescription of antipsychotic drugs and benzodiazepines. Conclusion: Optimising the use of psychotropic drugs is an important aim of specialised cognitive behavioural units. Units should continue to analyse and share good practice.

Key words : Alzheimer's disease, dementia, cognitive behavioural unit, psychotropic drugs, prescriptions

Résumé. Les symptômes comportementaux et psychologiques associés à la démence (SCPD) sont inscrits dans l'évolution de la maladie démentielle. Les unités cognitivo-comportementales (UCC) ont été créées afin d'optimiser la prise en charge des patients qui présentent ces SCPD. L'objectif principal de l'étude était de suivre l'évolution de la consommation de psychotropes entre l'entrée et la sortie de l'unité. L'objectif secondaire était de comparer les profils de prescriptions des deux principaux médecins. *Méthode* : Étude monocentrique, descriptive, rétrospective, entre mai 2016 et mai 2018. *Résultats* : La consommation de psychotropes des 123 patients restait stable à la sortie. Les prescriptions de neuroleptiques et d'antidémence diminuaient ($p < 0,05$) alors que celles de benzodiazépines hypnotiques et d'antidépresseurs augmentaient ($p < 0,05$). Le profil de prescription des deux médecins était similaire, hormis pour les co-prescriptions de neuroleptiques ou de benzodiazépines. *Conclusion* : L'optimisation des prescriptions de psychotropes est un objectif majeur de la prise en charge en UCC des sujets âgés atteints de maladie d'Alzheimer et maladies apparentées. L'analyse et les échanges de pratique doivent être poursuivis.

Mots clés : maladie d'Alzheimer, démence, unité cognitivo-comportementale, psychotropes, prescriptions

The cognitive-behavioural unit (*unité cognitivo-comportementale*, UCC) at the Toulon-LaSeyne intercommunal general hospital was created in 2011 as part of the second French Alzheimer's plan for 2008–2012 [1]. This unit is located in a geriatric facility which brings together the follow-up treatment and rehabilitation centre (*soins de suite et de réadaptation*, SSR), the residential care facility for elderly people (*établissement d'hébergement*

pour personnes âgées dépendantes, EHPAD) and the long-term nursing unit (*unité de soins de longue durée*, USLD). The unit treats patients suffering from behavioural and psychological symptoms of dementia (BPSD) or emergency conditions related to this syndrome [2].

Patients and their caregivers are seen by a multi-disciplinary team of doctors, neuropsychologists, occupational therapists, dieticians, social workers, nurses and

gerontology assistants. The structural and functional organisation of the unit favours non-medicinal therapies. In addition to the environmental approach (safe and secure walking area, individual rooms), the carers combine sensory activities (relaxation room, singing, listening to music), motor activities (soft gym, manual activities), and cognitive and psycho-social activities (cooking workshops, animal-assisted therapy) [3]. These approaches are mentioned in the 2008 and 2009 recommendations published by the French National Authority for Health (*Haute autorité de la santé*, HAS) [4, 5].

The objective of treatment is to enable patients to return to their homes, having gained control of the most disruptive forms of BPSD (agitation, aggressiveness, delirium, hallucinations, anxiety, etc.) These symptoms are assessed using the neuropsychiatric inventory (NPI-ES), which is an assessment tool intended for use by caregivers or informal carers dealing with patients on a daily basis [6]. This tool, now widely used in UCCs [7], is one criterion for assessing the efficacy of both drug and non-drug therapies.

Medical expertise calls upon the use of pharmacological treatments; the use of psychotropic drugs is intended to reduce the intensity and frequency of BPSD. However, many studies suggest an association between psychotropic drug use and iatrogenic side effects, such as cerebrovascular disorders [8], falls [9], and hip fractures [10]. Other studies suggest increased mortality in elderly patients taking neuroleptics [11]. It is therefore essential to optimise the prescription of psychotropic drugs, and UCCs were created with the aim of limiting their use.

The development of this work is based on three assumptions. The first is that there would be a decrease in the number of psychotropic drugs prescribed between admission and discharge from the UCC, the second is that there would be a decrease in the NPI score between admission and discharge from the UCC, and the third is that there would be different prescribing habits among physicians.

Materials and method

This is a descriptive, monocentric, retrospective study. The main objective was to study changes in psychotropic drug prescriptions between admission to and discharge from the UCC. The second objective was to compare the discharge prescriptions of two prescribers and to identify prescribing patterns.

The study included all patients hospitalised at the Toulon UCC over a two-year period; between 1st May 2016 and 1st May 2018. Patients were excluded if they were under the age of 60, if they died while in the unit, and if their records

were incomplete or uninterpretable. For patients who were hospitalised on multiple occasions between 1 May 2016 and 1 May 2018, only their most recent stay was included.

Statistical collection and analysis

All medical records existed in electronic format (Orbis® software). Each patient also had a paper record which was archived by the medical information department. The data were anonymised, and the variables studied were recorded in an Excel spreadsheet.

The analyses were carried out using the SPSS® software (20th version). All variables were subjected to a standard descriptive analysis. Qualitative characteristics were described by frequencies and percentages. Quantitative characteristics were described by mean \pm standard deviation, 95% confidence interval, and minimum and maximum. The chi-square test was used for qualitative variables and the Student or Anova test was used for quantitative variables.

Results

Between 1st May 2016 and 1st May 2018, 155 stays were recorded. Following analysis of the patient records, a total of 123 patients were included in the study (figure 1).

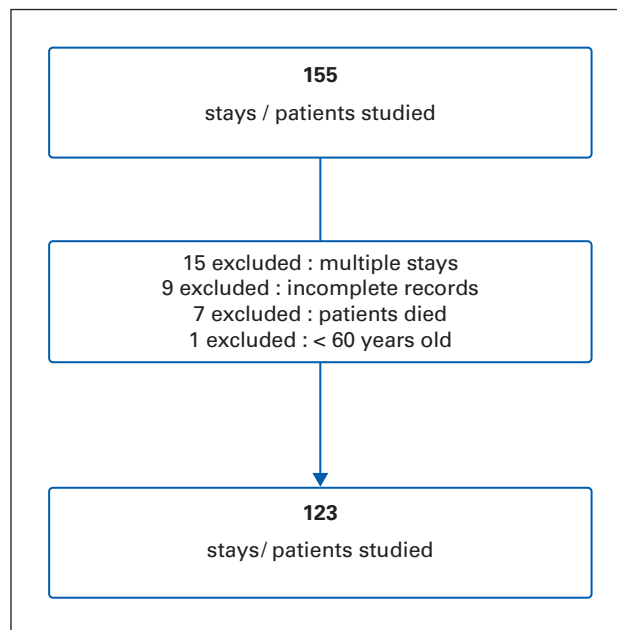


Figure 1. Study flowchart 1st May 2016 to 1st May 2018.

Figure 1. Diagramme de flux Période d'étude du 1^{er} mai 2016 au 1^{er} mai 2018.

Characteristics of the Toulon UCC

The unit has a capacity of 12 beds. The healthcare team consists of one nurse and two geriatric nursing assistants (GNAs) per day, plus a 0.4 full-time equivalent (FTE) occupational therapist, a neuropsychologist (0.4 FTE) and a physician (0.6 to 1 FTE during the study period). At night, one nurse and one GNA are on duty.

Description of the population

Socio-demographic characteristics

The typical patient admitted to the Toulon UCC was a single male aged 80 years old (47.2%), living at home (68.3%). An informal caregiver, usually a family member, was identified in 84% of cases and a second caregiver was identified in 46.3% of cases. In 46.3% of cases, the patient had children living in or near the same local area as the patient.

Nearly one in three patients (31.8%) lived in an institution, while only two patients lived in an independent living facility for the elderly.

Upon admission, legal guardianship was granted for 14.5% of patients or was in the process of being granted for 5% of patients (table 1).

Clinical characteristics of patients upon admission

More than 60% of patients hospitalised at the UCC presented with polypathology and more than half of patients had at a history of at least two cardiovascular events.

More than one in three patients had experienced at least three falls in the past year.

Table 1. Sociodemographic characteristics of patients.

Table 1. *Caractéristiques sociodémographiques des patients.*

Sociodemographic characteristics	n = 123
% male (n)	65 (80)
Age	79.21 ± 7.472
% educational level below baccalaureate	79.4 (27)
% live alone (n)	47.2 (58)
% live as a couple (n)	52.8 (65)
Caregiver	
% primary caregiver identified (n)	84.6 (104)
% primary caregiver = spouse, partner, ex-spouse (n)	44.7 (55)
% primary caregiver = child (n)	31.7 (39)
% other caregiver, family or non-family (n)	8.1 (10)
% second caregiver identified (n)	46.3 (57)
% children nearby (n)	46.3 (57)
Usual residence	
% home (n)	68.3 (84)
% UP of EHPAD (n)	28.5 (35)
% UHR (n)	3.3 (4)
% legal protection on admission (n)	19.5 (24)

UP: protected living unit; UHR: reinforced accommodation unit.

Nearly 38% of patients had previously been hospitalised for BPSD and 11.4% had previously been admitted to an emergency department (as an outpatient) for the same reason.

Medical-social treatment was considered to have failed in the case of nine patients, who had previously had to change EHPAD. One of them had left their EHPAD to return home (upon his wife's initiative).

The aetiological diagnosis of dementia was unknown for 46.3% of patients. Of these, 10% had a non-dementia pathology that could manifest as BPSD: two congenital neurological disorders including Down syndrome, decompensation due to an anxiety-depressive disorder, a melancholic state, post-traumatic stress disorder and amyloid angiopathy.

Alzheimer's disease was the most common type of dementia (30.9%). This was followed by vascular dementia (11.4%), frontotemporal dementia (4.8%), Lewy body dementia (3.2%), alcoholic dementia (1.6%), paraneoplastic dementia (0.8%) and Parkinsonian dementia (0.8%) (table 2).

While 42% of patients were admitted directly from their home or place of residence, more than half of the patients

Table 2. Clinical characteristics of patients.

Table 2. *Caractéristiques cliniques des patients.*

% polypathology (n)	62.6 (77)
% at least two previous cardiovascular events (n)	52.8 (65)
% repeated falls (n)	39.6 (40)
% history of addiction(s)	41.3 (43)
% current addiction (n)	14.4 (15)
% psychiatric history(ies) (n)	23 (26)
% psychiatric treatment before dementia (n)	10.4 (11)
<i>History of hospitalisation and emergency visits</i>	
% hospitalisation(s) for BPSDs (n)	38.7 (43)
% at least two hospitalisations for BPSDs (n)	8.1 (9)
% hospitalisation(s) in UCC (n)	13.8 (15)
% emergency department visit(s) for BPSDs	11.4 (12)
% EHPAD/UHR failure (n)	8.1 (10)
<i>Type of dementia</i>	
% unidentified dementia (n)	46.3 (57)
% Alzheimer's (n)	30.9 (38)
% other type of dementia (n)	22.8 (28)
% paraclinical examinations (n)	91.8 (89)
% biological markers of dementia (n)	16.5 (16)
% nuclear imaging (n)	19.6 (19)
% neuropsychological assessment (n)	36.1 (30)
% memory assessment / neurological consultation	70.5 (79)
% consultation(s) with psychiatrist (after diagnosis of dementia)	15.5 (17)
% day care and/or specialised Alzheimer's team	15.7 (16)

BPSD: behavioural and psychological symptoms of dementia; UP: protected living unit; UHR: reinforced accommodation unit.

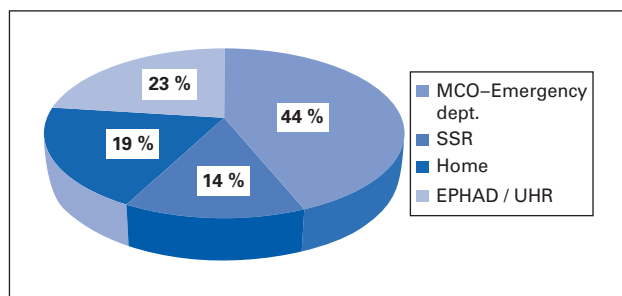


Figure 2. Origin of patients.

Figure 2. Provenance des malades.

were referred by a hospital department. Of those who were referred by a hospital department, 29 were referred following a short stay in a geriatric ward, 16 by a general practice department, and two by a neurology department. Seven patients were admitted directly from the emergency department. No patients were referred from a psychiatric ward (figure 2).

Characteristics upon discharge

The average length of stay was 51.2 days.

Discharge was considered to be delayed for nearly one in five patients. The reasons given in the medical record were: waiting for a place in a follow-up facility (15%), waiting for official guardianship, waiting for official guardianship and a place in a follow-up facility, and a change in life planning (7%).

Only 43.7% of patients returned to their place of residence. Changes in residence were mostly represented by admissions to EHPADs (37.9%) or to reinforced accommodation units (*unités d'hébergement renforcés* [UHR]; 12.6%). In addition, five patients (4.8%) were obliged to change institutions and were referred to a new EHPAD or UHR, as the original facility was no longer able to provide appropriate treatment. In addition, one patient was initially at home and was admitted to an independent living facility for the elderly (table 3).

Concerning the 84 patients who were living at home before their admission: Only 20.2% ($n = 17$) returned to the same place of residence, while 57.1% ($n = 48$) were referred to a medical-social institution (including 10 UHRs), and one patient was admitted to an independent living facility for the elderly. Finally, 18 patients were transferred to another hospital department (short-stay medical departments [referred to by the French acronym, MCO] and follow-up care facilities [referred to by the French acronym, SSR]).

The mean NPI-ES score was reported from 16.20 at admission to 15.61 at discharge ($p = 0.722$) (table 4).

Table 3. Duration of stay and destination at discharge.

Table 3. Durée de séjour et destination à la sortie.

Average length of stay (in days)	51.28 ± 47.401
Min-Max	3–253
Median	35
% delayed discharge from department (n)	21.1 (26)
Destination ($n = 103$)	
% return to original place of residence	43.7 (45)
% change of residence	56.3 (58)
% admission to UP of EHPAD (n)	37.9 (39)
% entry to UHR (n)	12.6 (13)

UP: protected living unit; UHR: reinforced accommodation unit.

Table 4. Scores NPI (inventaire neuro-psychiatrique) à l'entrée et à la sortie.

Table 4. Neuropsychiatric inventory upon admission and discharge.

NPI score, caregiver version	
NPI admission ($n = 102$)	16.20 ± 14.235
NPI discharge ($n = 77$)	15.61 ± 14.070

Table 5. Polymedication and use of psychotropic drugs.

Table 5. Polymédication et consommation totale de psychotropes.

	At admission	At discharge	p
Total drugs	6.57 ± 2.70	6.68 ± 2.653	0.583
% polymedication (n)	66.7 (82)	64.2 (79)	0.000
Total psychotropic drugs	2.93 ± 1.249	3.14 ± 1.467	0.086

Changes in drug use

The number of patients taking polymedication (> five drugs per day) was lower at discharge ($p < 0.05$). However, the average number of drugs remained above six per day.

The average number of psychotropic drugs per patient, upon admission and discharge, was three per day (table 5).

Overall consumption of neuroleptics was lower at discharge ($p < 0.05$), but still affected nearly 69% of patients leaving the unit.

At discharge, 49.6% of patients were prescribed atypical neuroleptics, compared to 52% at admission ($p < 0.05$). Risperidone was the most frequently prescribed drug at both admission and discharge. Olanzapine was prescribed very rarely (only one prescription on admission which was continued upon discharge), as was quetiapine, which was prescribed for a single patient. Similarly, sulpiride was prescribed only once upon admission and was not found on any discharge prescriptions.

Twenty-six percent of patients were prescribed first-generation neuroleptics upon discharge (compared to

Table 6. Changes in use of antipsychotic drugs.**Table 6.** Évolution de la consommation de neuroleptiques.

	At admission	At discharge	p
% neuroleptics, all classes (n)	74.8 (92)	69.1 (85)	0.004
Atypical neuroleptic % (n)	52 (64)	49.6 (61)	0.000
% risperidone (n)	43.9 (54)	39 (48)	0.000
% Clozapine (n)	5.7 (7)	8.9 (11)	0.000
neuroleptic % 1st generation (n)	33.3 (41)	26.0 (32)	0.000
% loxapine (n)	13.0 (16)	14.6 (18)	0.000
% combination of 2 NLP* (n)	13.8 (17)	7.3 (9)	0.021

NLP: neuroleptic.

Table 7. Most frequently prescribed antipsychotic drugs.**Table 7.** Palmarès des neuroleptiques les plus prescrits.

	Drug	% (n)
1	% upon admission (n)	Risperidone 43.9 (54)
	% upon discharge (n)	Risperidone 39 (48)
2	% upon admission (n)	Loxapine 13.0 (16)
	% upon discharge (n)	Loxapine 14.6 (18)
3	% upon admission (n)	Tiapride 8.1 (10)
	% upon discharge (n)	Clozapine 8.9 (11)
4	% upon admission (n)	Clozapine 5.7 (7)
	% upon discharge (n)	Tiapride/cyamemazine 4.8 (3/3)

33.3% on admission, $p < 0.05$). Three drugs accounted for nearly 80% of first-generation neuroleptic prescriptions: loxapine, the most widely prescribed at the time of admission (13%); tiapride (8.1%); and cyamemazine (4.8%). Loxapine remained the most frequently prescribed drug on discharge (14.6%) and tiapride and cyamemazine were each prescribed to three patients (4.8%) (table 6).

The proportion of prescriptions combining two or more neuroleptics (all classes) decreased at discharge ($p < 0.05$). The second neuroleptic was generally prescribed for conditions such as "agitation or aggression" and was generally not administered on a daily basis (table 6).

There were only three prescriptions of so-called "delayed-onset" neuroleptic drugs (two prescriptions of risperidone and one of modécate) upon admission, compared to only one prescription at discharge (modécate).

Risperidone and loxapine alone accounted for more than half of all neuroleptic prescriptions (table 7).

Other drugs (at admission and discharge combined) were very poorly represented. First-generation neuroleptics were haloperidol, pipamperone, periciazine, and modécate, and second-generation neuroleptics included olanzapine, quetiapine, and sulpiride.

Table 8. Changes in the use of benzodiazepines.**Table 8.** Évolution de la consommation de benzodiazépines.

	At admission	At discharge	p
% BZD* anxiolytic (n)	72.4 (89)	78 (96)	0.103
% Alprazolam (n)	26.8 (33)	13.0 (16)	0.000
% Oxazepam (n)	26.8 (33)	31.7 (39)	0.000
% Prazepam (n)	8.9 (11)	18.7 (23)	0.000
% hypnotic BZD (n)	50.4 (62)	57.7 (71)	0.000
% Zopiclone (n)	39.0 (48)	46.3 (57)	0.000
% BZD + hypnotic BZD (n)	37.4 (46)	48.0 (59)	0.000

Regarding anxiolytic benzodiazepines, oxazepam (half-life of eight hours) was the most frequently prescribed drug at both admission and discharge and its use increased slightly ($p < 0.05$).

The prescription of prazepam (half-life of between 30 and 150 hours) doubled at discharge ($p < 0.05$), while the prescription of alprazolam (half-life of between 10 and 20 hours) halved ($p < 0.05$).

Clotiazepam (half-life of four hours) and lorazepam (half-life of between 10 and 20 hours), which have short half-lives, were not prescribed.

Concerning hypnotic benzodiazepines, only four drugs were recorded. Zopiclone was the most frequently prescribed and its use increased noticeably ($p < 0.05$). This was followed by lormetazepam (nine patients at admission and eight at discharge), then zolpidem (four patients at admission and five at discharge) and finally nitrazepam (one at admission and one at discharge).

A combination of the two types of benzodiazepines increased and were taken by nearly one in two patients at discharge (table 8).

The antidepressants (at admission and discharge combined) documented were:

– venlafaxine (SNRI); paroxetine, sertraline, escitalopram, and citalopram (SSRIs); mirtazapine and mianserin (antagonists of 2, 5HT₂ and 5HT₃ receptors); amitriptyline (MAOI), tianeptin and clomipramine (tricyclic) and agomelatine.

There was an overall increase in the prescription of antidepressants, with a significant proportion of α_2 receptor antagonists and 5HT₂ and 5HT₃ receptor antagonists; mostly mianserin ($n = 23/28$).

On admission and discharge, MAOIs and tricyclics were least frequently taken (table 9).

A few patients had a prescription for a combination of two antidepressants when they were admitted, which was corrected at discharge.

Table 9. Changes in the use of antidepressants.**Table 9.** Évolution de la consommation d'antidépresseurs.

	At admission	At discharge	p
% antidepressants (n)	34.1 (42)	41.5 (51)	0.000
% SSRIs (n)	50 (21)	33.3 (17)	0.000
% R-5HT2/5HT3 (n)	28.6 (12)	54.9 (28)	0.000

SSRIs: selective serotonin reuptake inhibitors; R-5HT2/5HT3: α 2, 5HT2 and 5HT3 receptor antagonists.**Table 10.** Changes in the use of cholinesterase inhibitors and memantine.**Table 10.** Évolution de la consommation d'antidémantiels.

	At admission	At discharge	p
% anti-dementia drugs (n)	19.5 (24)	6.6 (8)	0.000
% AChEI (n)	10.6 (13)	3.3 (4)	0.000
% memantine (n)	8.9 (11)	3.3 (4)	0.000

AChEI: acetylcholine esterase inhibitor.

Table 11. Changes in the use of antimanic agents, anticonvulsants, histamine antagonists, melatonin and other psychotropic drugs.**Table 11.** Évolution de la consommation de thymorégulateurs, antiépileptiques, antihistaminiques, mélatonine et autres psychotropes.

	At admission	At discharge	p
% thyroid regulator (n)	5.7 (7)	4.9 (6)	0.000 (Fisher)
% antiepileptic (n)	3.3 (4)	7.3 (9)	0.000
% anti-H1 (n)	3.3 (4)	6.5 (8)	0.021
% melatonin (n)	3.3 (4)	10.6 (13)	0.364
other psychotropic drugs (n)	4.1 (5)	8.9 (11)	0.000

anti-H1: antihistamine.

There was a significant reduction in the prescription of AChEI and memantine ($p < 0.05$), which were prescribed relatively rarely (table 10).

There was an increase in prescriptions for antiepileptics and antihistamines (table 11). For the latter pharmacological class, hydroxyzine and alimemazine were the only two prescribed. Nutrimazine was prescribed in drinkable form.

The thyroid regulators prescribed were sodium valproate, valpromide and depamide (table 11). None of the patients were taking carbamazepine.

The prescription of melatonin was stable (table 11). It should be noted that half of the patients on melatonin were also taking a benzodiazepine hypnotic.

Table 12. Comparison of antipsychotic drug prescriptions.**Table 12.** Comparaison des prescriptions de neuroleptiques.

	Assistant	Hospital practitioner	p
% all classes of neuroleptics	60.9 (28)	78 (32)	0.084
% NLP 1G (n)	34.8 (16)	22 (9)	0.139
% NLP 2G (n)	39.1 (18)	56.1 (23)	0.086
% combination of 2 NLP	13 (6)	0	0.019

NLP 1G: first-generation neuroleptic; NLP 2G: second-generation neuroleptic (atypical neuroleptic).

Regarding other psychotropic drugs, these were primarily levodopa and buspirone. The exceptional presence of etifoxin (anxiolytic) should also be noted.

Comparison of prescriptions at discharge between the two main prescribers

Four practitioners worked at the UCC during the study period. Prescriptions at discharge made by the two physicians who wrote the most prescriptions were compared. These two physicians included the oldest doctor (a hospital practitioner who had participated in the opening of the unit) and the youngest doctor (an assistant). Each wrote about a third of all prescriptions; 41 and 46 prescriptions, respectively.

Regarding the assistant's prescriptions, 69.6% involved polymedication (compared to 68.3% for the hospital practitioner). The total number of drugs prescribed was approximately the same (about 6.7 drugs per patient), and this was also the case for the average number of psychotropic drugs prescribed; about 3.2.

Analyses revealed that both physicians had similar prescribing profiles. They prescribed anxiolytic BZDs to more than two thirds of their patients, and each of them prescribed oxazepam first, followed by prazepam and then alprazolam. With regards to neuroleptics, they prescribed risperidone first, followed by loxapine and then clozapine. There was no difference in the prescription of antidepressants (50% for the assistant compared to 34.1% for the hospital practitioner, $p = 0.101$) or antidementia drugs (10.9% for the assistant compared to 7.3% for the hospital practitioner, $p = 0.556$). With regards to antiepileptic drugs, thyroid regulators and antihistamines, the numbers were very low, and there was no difference between the two doctors.

In contrast to the hospital practitioner who never prescribed a combination of neuroleptics, a co-prescription of neuroleptics was documented in 13% of the assistant's prescriptions ($p = 0.019$) (table 12), and involved a second-generation and a first-generation neuroleptic, the latter was

Table 13. Comparison of benzodiazepine prescription.
Table 13. Comparaison des prescriptions de benzodiazépines.

	Assistant	Hospital practitioner	p
% anxiolytic BZD	69.6	85.4	0.067
% oxazepam	30.4	41.5	0.198
% prazepam	10.9	19.5	0.204
% alprazolam	8.7	17.1	0.198
% non-hypnotic BZD	52.2	68.3	0.095
Combination anxiolytic BZD + hypnotic BZD (n)	39.1 (18)	61.0 (25)	0.034

prescribed on the condition that it should “be administered in the event of psychomotor agitation or a state of crisis”.

The hospital practitioner prescribed anxiolytic BZDs more often in combination with a hypnotic BZD ($p = 0.034$) (table 13), but never prescribed melatonin, while the assistant prescribed melatonin to more than one in five patients ($p < 0.05$).

It should be noted that the NPI-ES of patients followed by each of the two physicians were similar, 16.69 ± 13.390 for the assistant’s patients and 16.95 ± 16.717 for the patients followed by the hospital practitioner ($p = 0.950$).

Discussion

Our study population differs from the literature.

Regarding the use of psychotropic drugs in specialised cognitive behavioural units, we identified a clear male predominance (65%), whereas the majority of studies conducted in UCCs reported that the majority taking such drugs were females [7, 12–17]. That said, the elderly population in the Var is essentially female [18]. However, as in these studies, we did not determine the profiles (severity of dementia and most common BPSDs) of men and women treated at the unit separately.

Only 42.3% of patients were admitted directly from their place of residence (home or EHPAD-UHR), which appears to be lower than that reported by Saidlitz *et al.* [14] and Cayre *et al.* [15] (52% and 65%, respectively), but comparable with the results of the national survey published in 2013 by Noblet-Dick *et al.* (44%) [7].

The aetiological diagnosis of dementia was unknown for the majority of patients. Nearly two thirds had received at least one memory evaluation or neurological consultation, but letters from neurologists and geriatricians were not always available in their medical records. It appears likely that some patients had slipped through the neurogeriatric system, either because of their isolation (47% were single

and 15% had no family caregiver) or background. In the unit, a diagnostic review was not always carried out, which may have been due to the sometimes severe clinical picture, the absence of a geriatrician trained in memory evaluation, the non-systematic presence of a neurologist in the department, and the absence of an on-site technical platform. This lack of diagnostic expertise has been noted by several other authors [12, 13, 19].

This lack of expertise also concerns the evaluation of non-dementia pathologies, which were less frequent in our study [7, 12, 14].

In our study, the NPI-ES score upon admission appeared to be lower than that cited in the literature [7, 14, 19]. In addition, there was no improvement in NPI at discharge, while three studies describe an improvement in NPI during hospital stay [13–15]. In the study by Delphin-Combe *et al.*, an increase in NPI-ES score was observed between admission and discharge [16].

There are at least three reasons that may explain these differences:

- 1) At the Toulon UCC, the entry NPI-ES was generally calculated between the 7th and 14th day after admission, which may have resulted in an under-evaluation of symptoms at the usual place of residence;
- 2) caregivers were not always the same (rotation, short-term replacement) and some were poorly or inadequately trained in the identification and evaluation of BPSDs. Thus, it is likely that some non-informative items were under-assessed, although we did not study the frequency of each item to support this hypothesis.

These observations should encourage us to continue to improve information and training for carers in the unit, and in particular, new orderlies and nurses. The team’s level of expertise can only improve.

Only 43% of our patients returned to their place of residence. This is apparently lower than that reported in the literature [7, 12, 15, 16]. The preponderance of men who were single or living alone certainly explains the high rate of institutionalisation [20]. Caregiver burnout is another risk factor for institutionalisation [19, 20].

Our average length of stay was 52 days, which is higher than that reported in almost all available studies [7, 12–15, 19]. For some patients, the length of stay was increased due to the time required to appoint a legal representative, in order to be granted a social assistance allowance for accommodation, or obtain a place in an EHPAD-UHR best suited to the patient’s specific needs. Indeed, we frequently recorded difficulties in organising discharge (socio-familial isolation, lengthy administrative and legal procedures, financial problems). More than 80% of the UCCs surveyed in

2012 also mentioned difficulties in acquiring a place in an institution [7].

Trends in the use of psychotropic drugs

Psychotropic drugs are inappropriately prescribed in older people with Alzheimer's disease and related disorders (ADRD) [21]. The frequency of inappropriate prescriptions, as well as the seriousness of the resulting adverse events, prompted the French Haute Autorité de santé (HAS) to draft good practice recommendations for all psychotropic drugs for this indication [4, 5].

The objective of reducing the use of psychotropic drugs is included as part of the specifications documented by the UCCs and White Paper on Alzheimer's Units [22]. However, our study showed a stable level of psychotropic drugs, prescribed at admission and discharge, of about three drugs per patient. This appears to be higher than that reported in the literature, in particular, according to the studies by Saidlitz and Koskas which show the highest rates of 2.8 and 2.5 ($p < 0.05$) and 2.05 and 2.65 ($p = 0.3$), respectively [13, 14]. It should be noted that in our study, we counted all drugs documented on prescriptions, however, some psychotropic drugs were prescribed conditionally ("in the event of insomnia", "in the event of psychomotor agitation", "in the event of failure of oral treatment", etc.) and were therefore not necessarily administered.

Our study demonstrates a significant decrease in the percentage of patients who were prescribed neuroleptics, but 69.1 % of them continued to take such drugs. For comparison, the study by Koskas *et al.* conducted during the first year of the UCC at the Bretonneau Hospital reported stable use of neuroleptics between admission and discharge, at around 42% [13]. Saidlitz *et al.* also described a decrease in the prescription of neuroleptics, which affected 44 % of patients discharged from the Toulouse UCC [14].

The frequency and intensity of positive symptoms, such as delusions, psychomotor agitation, and hallucinations, certainly explain the high level of use of neuroleptics in the elderly ADRD population.

In our study, second-generation neuroleptics were more often prescribed than first-generation neuroleptics, the latter increasing the risk of mortality in elderly subjects with Alzheimer's disease [23].

The use of BZD anxiolytics was stable, but these were taken by more than 70 % of patients in the Toulon UCC. The high frequency of anxiety symptoms associated with dementia [24] and their similarity with depressive symptoms [25] certainly explain the sometimes frequent use of BZDs in UCCs [13, 14].

The prescription of prazepam doubled in our study between admission and discharge and accounted for almost 20 % of discharge prescriptions, probably because it is the only BZD available in oral form. However, its half-life is long (between 30 and 150 hours), and its use is not recommended [26]. The prescription of alprazolam halved between admission and discharge, but it was not clear whether this was actually replaced by prazepam.

In terms of hypnotic BZDs, zopiclone and zolpidem, which are short-life BZDs, these were taken in the majority of cases, which appears to be consistent with the recommendations [4].

It should be noted that antihistamines specified on discharge prescriptions – primarily the oral solution of alimemazine – were prescribed in the evening for sedation, however, co-prescriptions with hypnotic BZDs were not considered.

Despite a significant increase in the prescription of antidepressants, this did not exceed 42 %, which appears to be lower than that in the literature [13, 14]. However, the efficacy of antidepressants in ADRD patients is controversial [27].

The significant increase in the number of prescriptions for $\alpha 2$ receptor and 5HT₂ and 5HT₃ receptor antagonists was related to the preferential prescription of mianserin, which would be of interest in patients suffering from sleep disorders [28].

Regarding thyroid regulators, our data indicate a lower frequency than that reported by Koskas *et al.* (17 % on admission, 23 % on discharge $p = 0.44$) [13] or Saidlitz *et al.* who reported an increase in the prescription of behavioural antiepileptic drugs (almost 40 % on discharge) [14]. Some antiepileptic drugs have beneficial psychiatric effects, and some are used in psychiatry for their thyroid-regulating and/or antidepressant effects [29], or in geriatric settings for the treatment of behavioural and aggression disorders [30]. Their efficacy is controversial and they are not recommended by the HAS [4], therefore their use should be limited.

The efficacy of acetylcholinesterase inhibitors is considered to be low [31] and their safety is often criticised [32]. The latest HAS recommendations encourage prescribers to limit their use [33].

Comparison between the two prescribers

There did not appear to be any great difference between the prescriptions made by the two doctors, both of whom reflected two main trends: a preference for second-generation neuroleptics as well as short half-life benzodiazepines. Although there was a difference in age

and experience between the two prescribers, their shared view of geriatrics probably influenced their prescribing habits. Moreover, it is likely that the senior physician influenced his junior. Thus, while the profile of patients recruited may vary according to the profile of the physician in charge of the unit [34], the use of psychotropic drugs may also vary according to the profile of the prescriber, and it would have been interesting to be able to compare the data based on a neurogeriatrician or a psychiatrist.

It would also have been interesting to note the proportion of drugs prescribed according to the condition of the patient. Indeed, the assistant sometimes prescribed a first-generation neuroleptic by injection based on the instruction "to be administered in case of psychomotor agitation not responding to oral treatment or in crisis situations".

Finally, confirmation that the hospital practitioner tended to prescribe more BZD anxiolytics than the assistant would require a larger cohort.

Key points

- Overall use of psychotropic drugs is stable between admission to and discharge from the UCC at Toulon.
- Neuroleptics and benzodiazepines are widely prescribed.
- Most patients receive polymedication.
- The aetiology of dementia syndromes is specified in only a minority of cases.

Conclusion

At the Toulon UCC, between May 2016 and May 2018, there was a decrease in prescriptions for neuroleptic and

antidementia drugs and an increase in prescriptions for hypnotic BZDs and antidepressants. The average number of psychotropic drugs prescribed at discharge did not decrease. In the absence of pharmacological research leading to new drugs on the market as well as the continued use of specific facilities, development of non-medicinal therapies, and training of formal and informal caregivers, the use of psychotropic drugs in elderly people with Alzheimer's disease and related disorders may be limited.

Other means of improving the use of psychotropic drugs include training prescribers, through the development and publication of good practice recommendations and prescribing tools. Data on accurately assessing prescribing patterns could allow physicians to compare themselves with their peers and enable them to better analyse their practice.

This work has enabled the UCC team in Toulon to analyse its practices and to develop ways of improving the overall care of their patients, such as continuing and increasing the theoretical training given to carers and the use of different evaluation scales for BPSDs.

A prospective study has also been established, entitled "Trajectory of patients hospitalised at the Toulon UCC". This began in May 2018 with the objective of studying the outcome of patients one year after discharge, in particular, with regards to survival rate, remaining at the place of residency, re-hospitalisation rate and use of psychotropic drugs. This will perhaps provide a better understanding of the role of the UCC in providing geriatric care in the Toulon area.

Conflicts of interest: None of the authors have any conflicts of interest to disclose.

Bibliography

1. Circulaire N° DHOS/O2/O1/DGS/MC3/2008/291 du 15 septembre 2008 relative à la mise en œuvre du volet sanitaire du plan Alzheimer 2008-2012 - APHP DAJ [Internet]. [cited 01/09/2018]. 2008. Available from: <http://affairesjuridiques.aphp.fr/textes/circulaire-ndhoso2o1dgsmc32008291-du-15-septembre-2008-relative-a-la-mise-en-oeuvre-du-volet-sanitaire-du-plan-alzheimer-2008-2012/>.
2. Benoit M, Brocker P, Clement J-P, Cnockaert X, Hinault P, Nourashemi F, et al. Les symptômes psychologiques et comportementaux de la démence : description et prise en charge. *Rev Neurol (Paris)* 2005; 161(3): 357-66.
3. O'Neil ME, Freeman M, Christensen V, Telerant R, Addleman A, Kansagara D. A systematic evidence review of non-pharmacological interventions for behavioral symptoms of dementia [Internet]. [cited 01/09/2018]. (VA Evidence-based synthesis program reports), Washington (DC): Department of Veterans Affairs; 2011. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK54971/>.
4. Haute Autorité de santé. Recommandation de bonne pratique. *Maladie d'Alzheimer et maladies apparentées : prise en charge des troubles du comportement perturbateurs* [Internet]. 2009, [cited 01/09/2018]. Available from: https://www.has-sante.fr/portail/jcms/c_819667/fr/maladie-d-alzheimer-et-maladies-apparenteesprise-en-charge-des-troubles-du-comportement-perturbateurs.
5. Haute Autorité de santé. *Recommandation de bonne pratique. Maladie d'Alzheimer et maladies apparentées : diagnostic et prise en charge*. [Internet]. 2011, [cited 23/08/2018]. Available from: https://www.has-sante.fr/portail/upload/docs/application/pdf/2011-12/recommandation_maladie_d_alzheimer_et_maladies_apparentees_diagnostic_et_prie_en_charge.pdf.
6. Robert PH, Médecin I, Vincent S, Staccini P, Cattelin F, Goni S. L'inventaire neuropsychiatrique : validation de la version française d'un instrument destiné à évaluer les troubles du comportement chez les sujets déments. *l'Année Gerontol* 1998; (5): 63-87.

7. Noblet-Dick M, Balandier C, Demoures G, Drunat O, Strubel D, Voisin T. État des lieux des unités cognitivo-comportementales (UCC) : résultats d'une enquête nationale. *Geriatr Psychol Neuropsychiatr Vieil* 2013 ; 11(2) : 151-6.
8. Mittal V, Kurup L, Williamson D, Muralee S, Tampi R. Risk of cerebrovascular adverse events and death in elderly patients with dementia when treated with antipsychotic medications: a literature review of evidence. *Am J Alzheimers Dis Other Dement* 2011 ; 26(1) : 10-28.
9. Leipzig RM, Cumming RG, Tinetti ME. Drugs and falls in older people: a systematic review and meta-analysis: I. Psychotropic drugs. *J Am Geriatr Soc* 1999 ; 47(1) : 30-9.
10. Saarelainen L, Tolppanen A-M, Koponen M, Tanskanen A, Sund R, Tiihonen J, *et al.* Risk of hip fracture in benzodiazepine users with and without alzheimer disease. *J Am Med Dir Assoc* 2017 ; 18(1) : 87e15-21.
11. Wang PS, Schneeweiss S, Avorn J, Fischer M, Mogun H, Solomon D, *et al.* Risk of death in elderly users of conventional vs. atypical antipsychotic medications. *N Engl J Med* 2005 ; (253) : 2335-41.
12. Baudemont C, Merlet I, Boisguezheuec F, Liou E, Tartarin F, Ragot S, *et al.* Unité cognitivo-comportementale : facteurs prédictifs de réadmission à 3 mois. *Geriatr Psychol Neuropsychiatr Vieil* 2012 ; 10(3) : 277-83.
13. Koskas P, Belqadi S, Mazouzi S, Daraux J, Drunat O. Expérience d'une unité pilote (unité cognitivo comportementale) spécialisée dans la prise en charge des symptômes comportementaux et psychologiques de la démence. *Rev Neurol (Paris)* 2011 ; 167(3) : 254-9.
14. Saidlitz P, Sourdet S, Vellas B, Voisin T. Prise en charge des symptômes psychocomportementaux de la démence en unité spécialisée. *Geriatr Psychol Neuropsychiatr Vieil* 2014 ; 12(4) : 371-8.
15. Cayre F, Rivasseau-Jonveau T, Pop A. Les résultats à moyen terme de l'Unité cognitivo-comportementale du CHU de Nancy dans la prise en charge des troubles du comportement chez les personnes âgées atteintes de troubles cognitifs. *Revue Geriatr* 2016 ; 41(2) : 69-76.
16. Delphin-Combe F, Roubaud C, Martin-Gaujard G, Fortin ME, Rouch I, Krolak-Salmon P. Efficacité d'une unité cognitivo-comportementale sur les symptômes psychologiques et comportementaux des démences. *Rev Neurol (Paris)* 2013 ; 169(6-7) : 490-4.
17. Rouch I, Pongan E, Trombert B, Fabre F, Auguste N, Sellier C, *et al.* One-year evolution of behavioral and psychological symptoms of dementia in patients initially hospitalized in cognitive behavioral units: the EVITAL prospective cohort. *J Alzheimers Dis* 2017 ; 57(1) : 147-55.
18. Institut national de la statistique et des études économiques. *Estimation de la population au 1^{er} janvier 2018. Séries par région, département, sexe et âge de 1975 à 2018* [Internet]. [cited 14/09/2018]. 2018. Available from: <https://insee.fr/fr/statistiques/1893198>.
19. Pongan E, Delphin-Combe F, Laurent B, Vermorel M, Gonthier R, Krolak-Salmon P, *et al.* Enquête sur l'organisation et le fonctionnement des UCC un an après leur mise en place sur la région Rhône-Alpes. *NPG* 2014 ; 14(84) : 319-25.
20. Soto ME, Andrieu S, Gillette-Guyonnet S, Cantet C, Nourhashemi F, Vellas B. Risk factors for functional decline and institutionalisation among community-dwelling older adults with mild to severe Alzheimer's disease: one year of follow-up. *Age Ageing* 2006 ; 35(3) : 308-10.
21. Renom-Guiteras A, Thürmann PA, Miralles R, Klaassen-Mielke R, Thiem U, Stephan A, *et al.* Potentially inappropriate medication among people with dementia in eight European countries. *Age Ageing* 2018 ; 47(1) : 68-74.
22. Saidlitz P, Voisin T. Les unités cognitivo-comportementales. Unité de soins, d'évaluation et de prise en charge Alzheimer. *L'Année Geron-tol* 2015 ; 29 : 25-8.
23. Jackson JW, Schneeweiss S, VanderWeele TJ, Blacker D. Quantifying the role of adverse events in the mortality difference between first and second-generation antipsychotics in older adults: systematic review and meta-synthesis. *PLoS One* 2014 ; 9(8) : e105376.
24. Benoit M, Staccini P, Brocker P, Benhamidat T, Bertogliati C, Lechowski L, *et al.* Symptômes comportementaux et psychologiques dans la maladie d'Alzheimer : résultats de l'étude REAL.FR. *Rev Med Interne* 2003 ; 24 : 319s-24s.
25. Seignourel PJ, Kunik ME, Snow L, Wilson N, Stanley M. Anxiety in dementia: a critical review. *Clin Psychol Rev* 2008 ; 28(7) : 1071-82.
26. Laroche M-L, Charmes J-P, Merle L. Potentially inappropriate medications in the elderly: a French consensus panel list. *Eur J Clin Pharmacol* 2007 ; 63(8) : 725-31.
27. Ruthirakuhan MT, Herrmann N, Abraham EH, Chan S, Lanctôt K. Pharmacological interventions for apathy in Alzheimer's disease. *Cochrane Database Syst Rev* 2018 ; (5) : CD012197.
28. Camargos EF, Oliveira LF, Boaventura TDV, Quintas T. Mianserin for the treatment of sleep disorders in patients with dementia: a retrospective open-label study. *J Clin Psychopharmacol* 2012 ; 32(4) : 576-8.
29. Dussaule C, Bouilleret V. Effets psychiatriques des médicaments antiepileptiques chez l'adulte. *Geriatr Psychol Neuropsychiatr Vieil* 2018 ; 16(2) : 181-8.
30. Porsteinsson AP. Divalproex sodium for the treatment of behavioural problems associated with dementia in the elderly. *Drugs Aging* 2006 ; 23(11) : 877-86.
31. Knight R, Khondoker M, Magill N, Stewart R, Landau S. A systematic review and meta-analysis of the effectiveness of acetylcholinesterase inhibitors and memantine in treating the cognitive symptoms of dementia. *Dement Geriatr Cogn Disord* 2018 ; 45(3-4) : 131-51.
32. Isik AT, Soysal P, Stubbs B, Solmi M, Basso C, Maggi S, *et al.* Cardiovascular outcomes of cholinesterase inhibitors in individuals with dementia: a meta-analysis and systematic review. *J Am Geriatr Soc* 2018 ; 66(9) : 1805-11.
33. Haute Autorité de santé. *Guide parcours de soins des patients présentant un trouble neurocognitif associé à la maladie d'Alzheimer ou à une maladie apparentée* [Internet]. 2018, [cited 20/09/2018]. Available from: https://www.has-sante.fr/portail/upload/docs/application/pdf/2018-05/parcours_de_soins_alzheimer.pdf.
34. Gallerne VA, Gillioz AS, Le Ho C. État des lieux des unités cognitivocomportementales ou UCC Une étude descriptive sur le territoire national français en juin 2010. *Revue Geriatr* 2012 ; 37 : 15-27.