

LITERATURE REVIEW: COMPARISON OF THE TREATMENT OF INSTITUTIONALIZED PATIENTS EXHIBITING A DEGENERATIVE DEMENTIA IN SPECIALIZED CARE UNITS AND IN CONVENTIONAL EXTENDED STAY CARE UNITS BETWEEN 2006 AND 2016

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Abstract: *Introduction :* The number of individuals living in designated lodgings for elderly individuals (DLEI) in France continues to increase, amounting to close to 9% of the individuals over the age of 75 in 2012. The aim of our work was hence to provide a review of the recent literature from 2006 to February 2016 regarding the treatment of institutionalized patients exhibiting a neurodegenerative illness in specialized care units compared to conventional care units, according to specific criteria for quality of life, maintenance of higher functions, and in terms of behavioral changes or loss of autonomy. *Methods:* This involved a selective literature review carried out by a digitally-assisted search. The selected studies had to be less than 10 years old at the time of the data collection. The articles had to be published in English, or in French so as to include published studies that specifically addressed features relating to the French care system. Only studies addressing differences in treatments between special (SCU) and non-Special (n-SCU) units were considered, the others being excluded. *Results:* To compare treatment in SCUs and in n-SCUs, the studies used validated current indicators for assessing quality of life, cognition, behavioral issues, as well as autonomy in each of the units. Use of medicinal therapeutics, hospitalization rates, and physical restraints were also often investigated. Our work focused on recent studies taking into account the latest measures put in place in DLEIs comprising SCUs. A literature review carried out in 2013 that took into account historical studies did not find that SCUs were generally better in regard to providing care for patients with dementias. *Conclusion:* In conclusion, by specifically considering only the more recent studies, this work has allowed knowledge of the merits of development of specialized units to be updated, particularly in terms of the treatment of dementias.

Key words: Nursing home; prevention; functional decline; frailty.

Introduction

The number of individuals living in designated lodgings for elderly individuals (DLEI) in France continues to increase, amounting to close to 9% of the individuals over the age of 75 in 2012 (1). According the projections of the National Institute of Statistics and Economic studies (INSEE), by 2050, close to one in three individuals will be over 60 years of age (2). The prevalence of degenerative dementias follows these trends, and by 2020 close to three million individuals, patients, or caregivers in France will be affected in one way or another by Alzheimer's disease (3). Treatment of dementia patients requires a multidisciplinary approach and it involves substantial material, human, and financial resources. This burden impacts on the provision of care. The management of care teams, as well as the health policies that will have to be implemented to address the future health needs, are issues that need to be tackled now. The development of Special Care Units (SCU) often occurs within general healthcare facilities or already existent non-Special Care Units (n-SCU). SCU are designed for patients exhibiting moderate or advanced dementias. Performances in regard to the treatment of patients, and the

changes that they will incur in the working conditions for the care personnel have undergone evaluation. This has yielded an extensive amount of published materials over the past several decades. The difficulty with addressing the Psychological and Behavioral Symptoms of Dementias (PBSO) constitute a major issue for DLEIs, for which one of the primary aims is to guarantee the well-being of the residents and the care providers so as to maintain their quality of life as best as possible (4,5). For example, there are Continuing and Rehabilitation Care services (CRC) or specialized neurological services capable of treating these patients in dedicated care units. These measures were one of the issues addressed by the , for which measure 17 was the creation of specialized care units within the CRCs (6). Assessments performed following the implementation of this program have allowed some genuine benefits to be noted for patients at both the cognitive and the behavioral levels (7). Other facilities accommodate patients afflicted with Alzheimer's dementia in conventional units by adapting the care that is provided to them. This can have repercussions for the care teams that are less used to taking care of such patients, as well as on the other patients who may be perturbed by the behavior that is typical of many Alzheimer's patients.

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The medico-economic impact for the institutions that take on dependent elderly patients exhibiting these pathologies is hence substantial, and it needs to be established what the most efficient approach is, both for the patients and for the care teams, in terms of treatment in specialized care units or in a standard care units tailored to suit these patients.

There is, however, no definition regarding specialized units. Their role can be two-fold: the treatment of these specific pathologies may be better, as well as treatment of the commonly associated comorbidities (8). One of the aims of these units in particular is to reduce the prescription of psychotropic drugs (9). The units themselves can be subdivided based, for example, on the behavioral impairments or the level of patient agitation. In light of the importance of this issue, numerous studies have been published regarding the various treatments being used with these patients in different countries. In the Netherlands, the majority of dependent patients afflicted with dementia are institutionalized in specialized care units (9). In France on the other hand, differences in notions regarding care, differences in access to care, and differences in social security coverage are factors that appear to underlie a multitude of treatment options being used with these patients. In light of the development of these specialized units, providing a summary of the current knowledge as well as a comprehensive overview of the treatments is a suitable way to better guide the relevant policies and the development of DLEIs.

The aim of our work was therefore to give a review of the recent literature from 2006 to February 2016 concerning the treatment of institutionalized patients with neurodegenerative disease in specialized units of care compared to conventional care units according to specific quality criteria Life, maintenance Superior functions, and in terms of changes in behavior or loss of autonomy. A previous review, focusing on the first established of SCU, had not found a real advantage in the treatment of patients with dementia (9). This will make it possible to highlight the current practices in the implementation of SCU and what the results are in order to contribute to propose solutions that could be envisaged in the establishment of these structures in France.

Materials and Methods

Standards used

The recommendations of the EPOC (Effective Practice and Organisation of Care) group of the Cochrane collaboration were followed. This task force seeks "to promote the most effective professional practice" (10). Each of the PRISMA criteria was addressed and indexed (11). The STARLITE ("Standard for Reporting Literature searches") parameters were used (12). This involved a selective literature review carried out by a digitally-assisted search. The selected studies had to be less than 10 years old at the time of the data collection. The articles had to be published in English, or in French so as to include published studies that specifically addressed features relating

to the French care system. Only studies addressing differences in treatments between special (SCU) and non-special (n-SCU) units were considered, the others being excluded. The SCU could be part of a conventional facility or they could be independent entities. The studies could be cross-sectional, longitudinal, or they could be literature reviews. As the study topic was in regard to patients afflicted with degenerative dementia that live in institutions, studies pertaining to patients hospitalized at home were not taken into account. The patients could exhibit a dementia other than Alzheimer's disease, provided that this dementia required specialized treatment, since the aim was to evaluate what specialized treatments offer relative to treatments in conventional units.

Data sources

Several data bases were used to ensure that the results obtained were exhaustive. These data bases comprised Medline, Central, Embase, and Pascal. Various search interfaces were used to consult these bases (PubMed, SciencesDirect, PsycINFO, Ovid, Web of Science). More generic search engines such as Google Scholar were also used. The grey literature was studied using Open Grey. The references cited by the articles were taken into account.

Search terms

The terms were selected based on the data in the literature by taking into account the MeSH and non-MESH terms so as to be more exhaustive in the initial search. A step-by-step ascending method was used so that the set of terms would range from being broad to highly specific. Various subject headings were identified that had to be among the set of terms and separated by 'AND'. The synonymous terms were then implemented step-by-step by use of 'OR'. This search strategy was validated by all of the authors. The first set of terms used with the data bases was: (Aged [MeSH Terms] and (dementia [MeSH Terms] OR Alzheimer's disease [MeSH Terms]) and (long-term care [MeSH Terms] OR nursing home [MeSH Terms] OR assisted living facilities [MeSH Terms] OR health services for the aged [MeSH Terms] OR traditional care [MeSH Terms] OR housing for the elderly [MeSH Terms]) and (special care units [all fields] OR specialized care facilities [all fields]) AND (behavior [MeSH Terms] or cognition [MeSH Terms] or quality of life [MeSH Terms] or functional status [MeSH Terms] or activities of daily living [MeSH Terms] or social adjustment [MeSH Terms] or depression [MeSH Terms] or anxiety [MeSH Terms])).

Selection of the publications

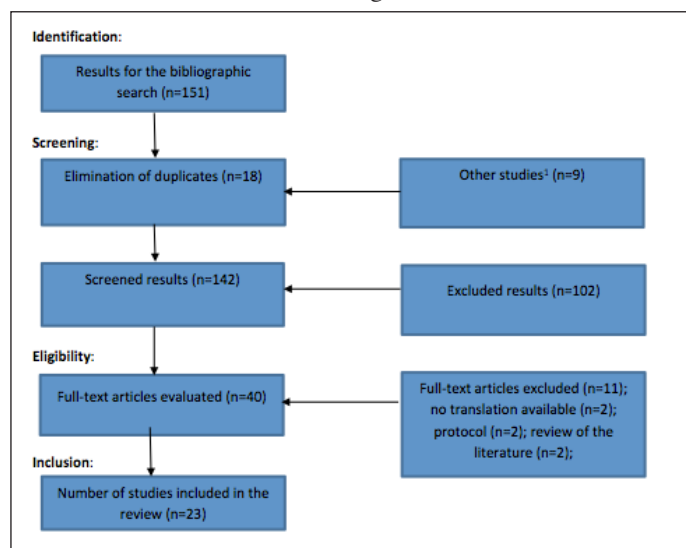
In the first instance, duplicates were removed. The selection of publications was performed blinded by two different participants according to a predefined method: selection of the title, comparison of the results, and perusal of the abstracts; followed by a second comparison of the results. The final selection was done jointly. Extraction of the data was

performed using a standardized data collection form, so as to generate the summary tables presented in the results. These tables were generated using Microsoft Excel 2010 software. The data were searched in regard to the following variables: the type of study, the duration of the study, the main aim, the number of patients included per group, the measured entities, the assessment criteria, the statistical methods that were used, the main results, and the conclusions. The following variables were eliminated in order for the tables to remain concise: advantages of SCUs, shortcomings of SCUs. After selection of the articles, we systematically probed for any biases, either in the conception of the study itself, or in the results. Any potential bias was elaborated on in the discussion.

Results

Finally 151 studies had been selected thanks to the set of terms used, 9 others studies had been added by authors. After the selection by title, 102 studies had been excluded and 40 had been fully read by the two authors. In the end, 23 (15%) studies had been included in the review. A flow chart of the selection process is presented in Figure 1. The relevant studies are summarized in Table 1, and they are ranked from the most recent to the oldest. This table indicates the type of study, the number of patients in each of the groups, the type of variables studied, the scales used, and the main results. There was no blind comparison between the two groups, patients and caregivers knowing whether the treatment was allocated or not. Studies were observational studies, cross sectional (65%) or longitudinal (35%). They were published in journals with reviewing committee.

Figure 1
Flow diagram



1. articles the authors were already aware of, OpenGrey, Google Scholar

Differences regarding the socio-demographic characteristics

The studies found a different medical profile and socio-demographic characteristics between patients living in SCUs and patients living in n-SCUs. Patients in SCUs exhibited more pronounced behavioral issues, and more pronounced neurodegenerative pathologies than patients in n-SCUs (13–15). SCU patients were younger and in better overall health than the patients in n-SCUs (13, 14, 16, 17).

Behavior: overall behavior, aggressiveness, and anxiety

Among the studies selected, 6 had specially focused on the evolution of behavioral disorders. The half of them did not show any differences between patients in SCUs versus in n-SCUs. However, the other half showed that SCUs were better in terms of improvement or slowing of the progression of symptoms (9, 13, 18). The level of aggression varied in the specialized and the non-specialized units depending on the study (9). Two studies (33%) appeared to indicate that there was an improvement in social activities in the specialized units (9, 18). The recommendations for addressing behavioral changes were applied more in the conventional units (19).

Functional status

Patients in SCUs had fewer urinary catheterizations and they were more autonomous in regard to bowel movements than patients in n-SCUs (20). Daily life activities of the patients (grooming, toilet use, meals) took place more often for patients in SCUs (17). Patients in SCUs had fewer bedsores (20), while patients afflicted with advanced dementias were found to have more bedsores (21).

Cognition

Patients treated in SCUs had a better level of cognition (17), but most of the time there was no observed difference in cognitive decline (60%). The application of the recommendations in regard to improvement of cognition occurred more in specialized units (19). A program undertaken in SCUs comprising non-pharmacological treatment allowed for an improvement of cognitive functions (18).

Quality of life

The average QUALID score appears to be higher for patients living in specialized units (22). Similarly, the overall quality of life measured according to other criteria was better in SCUs (2/9, 22%) (23,24). Some studies have found opposite results, with either a more rapid decline of the criteria linked to quality of life in these units (15,25), while others showed an improvement or a decline in SCU (26) or a even an absence of a difference between the two types of units for newly institutionalized patients (27). A study undertaken with patients afflicted with advanced dementia showed that quality care was achieved more often in SCUs (21,28). Living in an SCU was a factor that improved satisfaction with end-of-life care (28).

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Table 1
Summary of the selected publications

| Authors, year; country | Type of study | duration | Main objective | SCU vs. n-SCU | Items measured | Assessment criteria | Statistical tests used | Overall outcomes | Conclusions |
|------------------------------------|----------------------|-----------|---|-------------------------------|---|---|---|---|---|
| Mjorud M et al.; 2014; Norway | Longitudinal | 10 months | Study of the variables associated with quality of life | 80 vs. 118 | QUALID, NPI, CDR, PSMS | Variation of QUA-LID | Linear regression; multi-level regression | Decrease in the quality of life of patients in SCUs | The change in the QoL is associated with a change in NPS |
| Nobili A et al.; 2008; Italy | Longitudinal cohort | 18 months | Longitudinal comparison of 2 cohorts of SCU and n-SCU patients afflicted with dementia according to their various characteristics | 349 vs. 81 | Mortality, hospitalization, falls, use of physical restraints, MMSE, NPI, CIRS, ADL Barthel-index | Change in the mortality and the use of anti psychotics at 18 months; change in hospitalization, physical restraints, falls at 6 months; | Logistic and linear regression | Improvement of behavioral issues, less use of physical restraints, greater improvement in the NPI in n-SCU units, fewer hospitalizations, decrease in the use of antipsychotics in SCUs; yet a lack of beds in SCUs | Patient behavioral issues are better treated in SCUs |
| Selbaek et al.; 2008; Norway | Cross-sectional | 3 months | Comparison of the distribution of demencias, behavioral issues, use of anti psychotics between SCUs and n-SCUs | 313 SCU vs. 762 | NPI, CDR, physical self maintenance scale | Distribution of behavioral issues and the use of neuroleptics | Chi2, t-test | SCU patients are younger and afflicted with more serious neurodegenerative pathologies. a better overall condition, are more often subjected to physical restraints; units are distributed unevenly across the area | The distribution of SCUs depends on the area, there is an inequality of care for patients with the same health requirements |
| Weyerer S et al.; 2010; Germany | Cross-sectional | | Comparison of the quality of life in SCUs and n-SCUs | 594 vs. 573 | | | | More contact with the teams, less use of physical restraints, more involvement in activities, no difference in the use of psychotropic agents | Indications favoring a better quality of life in SCUs |
| Nazir A et al.; 2012; USA | Retrospective cohort | 3 months | Identification of the risk factors associated with falls | 21 587 SCU and n-SCU patients | New falls, CPS, data of the MDS | Occurrence of new falls | Logistic regression | No linear relationship between the cognitive impairment and the risk of falls; The risk of falls is higher in SCUs | The cognitive impairment must be taken into account in the measures to prevent falls in SCUs |
| Aukner C et al.; 2013; Norway | Cross-sectional | | Comparison of the nutritional status of patients in SCUs and n-SCUs | 164 vs. 194 | MUST, BMI, MUAC, TSF | Description of the nutritional status of patients in SCUs and n-SCUs | Chi2, t-test | No difference in the nutritional status of patients in SCUs and n-SCUs | Numerous limitations, results need to be interpreted with caution |

Table 1 (continued)

| Authors, year; country | Type of study | duration | Main objective | SCU vs. n-SCU | Items measured | Assessment criteria | Statistical tests used | Overall outcomes | Conclusions |
|---|-----------------|----------------|---|--|---|---|-----------------------------------|---|--|
| Crespo M et al.; 2013; Spain | Cross-sectional | | Comparison of the characteristics of patients in SCUs and n-SCUs and of their quality of life | 102 vs. 95 | QoL, socio-demographic criteria, behavioral issues, cognitive impairments | Description of the variables as a function of being in an SCU or n-SCU | Logistic regression | No difference between the groups | Specific treatment in an SCU needs more justification |
| Pekkarinen L et al.; 2006; Finland | Cross-sectional | 3 months | Comparison of the work-related stress factors in SCUs and n-SCUs | 38 vs. 53 (number of units) | Characteristics of the staff, markers of stress, characteristics of the units, care requirements | Description of the variables as a function of being in an SCU or an n-SCU | Chi2, t-test, Logistic regression | The dependency in the daily activities increases the work stress in SCUs, the behavioral issues decrease it. The SCU staff are better trained at managing behavioral issues | The factors for work stress differ between SCU and n-SCU teams |
| Luo H et al.; 2010; USA | Cross-sectional | | Comparison of the treatment in SCUs and n-SCUs | 750 vs. 1817 n-SCU in units with SCU, 3667 n-SCU | | Description of the variables as a function of being in an SCU or an n-SCU | Logistic regression | SCU patients require more specific care; Fewer bedsores, hospitalizations, weight loss in SCUs, and more falls | Cost-efficiency studies should be carried out in SCUs |
| Cadigan R et al.; 2012; USA | Longitudinal | 18 months | Study of the association of the quality of end-of-life in SCUs | 141 vs. 182 | Hospitalization, treatment of the pain and dyspnea, bedsores, parenteral nutrition, advanced care, antipsychotics, satisfaction with the care | Description of the variables as a function of being in an SCU or an n-SCU | Logistic regression | More treatment for dyspnea, fewer and shorter hospitalizations in SCUs, less PE nutrition, more HCP; in n-SCUs More treatment of pain, less use of antipsychotics | SCUs are associated with some but not all factors of quality of life |
| Palm R et al.; 2016; Germany | Cross-sectional | Data 2012-2014 | Study of the adherence to the guidelines between SCUs and n-SCUs | 264 vs. 264 | Dementia care questionnaire (for application of the guidelines), NPI, PSMS, DSS, socio-demographic data | Description of the variables as a function of being in an SCU or an n-SCU | Mixed general model | No difference in the guidelines between SCUs and n-SCUs | |
| Abrahamson K et al.; 2013; USA | Cross-sectional | 3 months | Study of the quality of life and cognitive decline as a function of SCUs and n-SCUs | 118 vs. 270 | QoL, CPS, MDS, ADL, LOS | Description of the variables as a function of being in an SCU or n-SCU | Chi2, t-test, Logistic regression | Residing in an SCU has a positive influence on the quality of life | Specific features of SCUs no doubt contribute to improving the quality of life |
| Wolf-Ostermann K et al.; 2012; Germany | Longitudinal | 12 months | Study of the quality of life between SCUs and SHAs | 22 vs. 34 | ADL, NPI, MMSE, GDS, QoL | Description of the variables as a function of being in an SCU or n-SCU | Chi2, t-test, Fisher test, GLM | No difference between SCUs and SHA | No recommendations for choosing one or the other type of unit |

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Table 1 (continued)

| Authors, year; country | Type of study | duration | Main objective | SCU vs. n-SCU | Items measured | Assessment criteria | Statistical tests used | Overall outcomes | Conclusions |
|--|-----------------|-----------------------------------|---|-------------------------------|---|--|--|---|---|
| Abrahamson et al.; 2012; USA | Cross-sectional | 3 months | Study of the quality of life according to 7 areas | 665 vs. 12442 | QoL, CPS (cogni- tive performance scale), ADL, | Description QoL as a function of cognitive decline, SCU/n-SCU | Logistic regression | Severe cognitive declines have better QoL in terms of comfort and envi- ronment, less good in terms of activi- ties, individuality, mood, and private life, better mood scores for patients in n-SCUs | The cognitive de- cline influences the quality of life |
| Zuideman S et al.; 2010; the Nether- lands | Cross-sectional | 1 months | Study of the influence of the environment on the psychiatric symptoms | 1289 SCU (different types) | GDS, CMAI, NPI | Description of NPI and CMAI (Cohen Mansfield agitation inventory) | Logistic regression | The environment influence the preva- lence of psychiatric symptoms; Patients in units with the most staff were the least listless | Patients in the larger units do not have more symptoms than those in the smaller SCU units |
| Verbeek H et al.; 2010; the Nether- lands | Cross-sectional | 9 months | Study of the characteristics, of the functional and cognitive status of SCU and n-SCU patients | 183 vs. 586 | ADL, CPS, DCSP (Dutch care severity packages) | Description of SCUs and n-SCUs as a function of variables of interest | Chi2 t-test, Logistic regression | Functional status and cognition are better in SCUs | |
| Kirkevold et al.; 2009; Norway | Cross-sectional | 5 months | Study of the declared use of me- dications in SCUs and n-SCUs | 623 vs. 1320 | Type of medication, what form of me- dication, how were they administered, ADL, NPI | Description of the reasons, of the type of medications, what determines their use | Chi2, t-test, Logis- tic regression | Consumption of hidden medications remains an issue in Norway even though the trend is decreasing | Being in an SCU constitutes an RF for hidden medi- cations |
| Castle NG; 2008; | Cross-sectional | Data over a period of 15 years | Study of the impact of opening an SCU unit in a retirement home | | Occupation rates, public funding or private health insurance | Description of the occupation rates of retirement homes, public funding or private health insurance | Logistic regression | Opening of an SCU has an impact on the occupation rate and the funding. These changes occur after a year and they increase annually | Opening of an SCU increases the bed occupation rate, in- volves more funding diversity, and limits losses |
| Engel S et al.; 2006; USA | Cross-sectional | | Study of the factors associated with satisfaction with the health care for pa- tients afflicted with advanced dementia | 78 vs. 70 | Demographic characteristics, cognitive status, ca- theterization, mood disturbances | Description of the healthcare proxies (HCP) variable as a function of variables of interest | Linear regression | A higher level of satisfaction in the SCU | Absence of cath- eterization, a higher comfort level, living in an SCU, are fac- tors that contribute to improvement in the level of end-of- life satisfaction |

Agitation and aggressiveness

Aggressive behaviors were constant and verbal agitation was more pronounced over time in SCUs (27). The environment appears to influence the neuropsychiatric symptoms and the behavioral disorders (29). Patients were less listless in the units for which the number of staff per patient was higher (29).

Prescription of psychoactive agents

The studies appear to show more depression or anxiety syndromes in the specialized care units. Use of high doses of psychotropic agents was a harbinger of secondary effects, and it appears to be ineffective in the long-run (30, 31). Evaluation of use of these agents, adherence to good practices, and associations hence appears to be paramount (32). These prescriptions partly appeared to be due to the environment of the patient, particularly the medical setting and the composition of the care team (32). In certain cases the prescription of psychotropic agents, particularly antipsychotics, antidepressants and anxiolytics, appears to be significantly higher in specialized care units (3/7, 43%) (14, 21, 31). In other studies, isolated use of antipsychotics was more limited in SCUs relative to n-SCUs (13). One study also showed that patients in SCUs were frequently subjected to the phenomenon of hidden medication (33).

Nutrition

The application of the recommendations regarding nutrition occurred more often in specialized care units (19). In most of the studies, there was no difference in the nutritional status of patients in SCUs and in n-SCUs (13, 16). It has also been observed that weight loss occurred less in SCUs (20).

Mobility

The application of the recommendations regarding the prevention of falls was more frequent in specialized units (5). Yet a recent studies have shown more frequent falls among patients in SCUs (20, 34). They did not provide evidence for a linear relationship between the cognitive deficiency and the notion of falls, with the patients afflicted with more severe deficiencies falling less than the patients afflicted with moderate deficiencies (34).

Hospitalization

Patients in SCUs were hospitalized less often than patients in n-SCUs (13, 20, 21).

The specialized units were more often located in large cities compared to conventional units, while specialized units had more beds and they were more onerous in terms of the daily cost (19). In specialized units, the recommendations of experts were used more often than in conventional units. Furthermore, specialized units more often relied on paramedical rehabilitation staff than did conventional units, and less on doctors or nursing staff (19).

Use of restraints

Depending on the study, use of restraints was reported to be either higher in SCUs (14), lower (23), or there was no difference (20).

Relating with the care teams

The patients in SCUs were in contact more with the care teams (23). The SCUs teams appeared to have less difficulty managing problems associated with behavioral issues, while the n-SCU teams had less difficulty managing problems associated with daily activities (35).

Discussion

To compare treatment in SCUs and in n-SCUs, the studies used reproducible and validated scores for assessing quality of life, cognition, behavioral issues, as well as autonomy in each of the units. Use of medicinal therapeutics, hospitalization rates, and physical restraints were also often investigated. Our work focused on recent studies taking into account the latest measures put in place in DLEIs comprising SCUs. A literature review carried out in 2013 that took into account historical studies did not find that SCUs were generally better in regard to providing care for patients with dementias(9). Thus, contradictory results regarding the treatment of dementia patients, both in terms of cognition as well as in terms of improvement in quality of life, or treatment of behavioral issues made it difficult to provide a clear ranking in favor of SCUs (36). In the same vein, some of the studies that we analyzed did not show better treatment of behavioral issues in SCUs (37–39). Autonomy in regard to daily activities and the functional status of patients in SCUs in terms of use of the bathroom were at a higher level, with the patients at SCUs being catheterized less, while being more autonomous in terms of their use of the bathroom and going to the toilet (17,20,40). Bedsores were less numerous in SCUs (20). Interpretation of these results needs to take into account the differences in the sociodemographic characteristics of SCU patients, who are often younger, in better overall health, while also suffering from more advanced stages of dementia than patients in conventional units. Thus, while it was found that falls were more frequent in SCUs, this can no doubt partly be explained by the fact that patients being cared for in SCUs are more often afflicted with more severe deficiencies than patients in n-SCUs, thereby giving rise to a higher risk of falling (34).

One of the features of SCUs is that they tend to rely more on paramedical therapeutics instead of administration of medications, thus favoring group psychology, rehabilitation by engaging in manual tasks, or implementation of means aimed at maintaining autonomy. Encouraging results in terms of improvement of cognitive functions, and avoidance of further degradation of behavioral issues of dementia patients were shown in the context of the application of a care program implementing non-medicinal therapeutics (17, 18).

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A study in regard to consumption of hidden medications in retirement homes has shown that living in an SCU amounted to a risk factor for such practices (33). Hence, while there is a tendency to promote non-medicinal therapeutics, the demands encountered with treating patients who are afflicted with relatively high levels of dementia are quite considerable and often require resorting to conventional medicinal therapeutics.

Regarding the application of the recommendations in place for the treatment of the elderly, a recent study did not show a difference between specialized and conventional units, with the exception of the more frequent application of recommendations for the treatment of behavioral issue in conventional care units (19). Behavioral issues are more common in conventional units than in specialized units.

Few studies were in regard to comparison of care units specializing in treatment of “standard” dementia versus more specific units, in smaller scale units (41,42). In these new units the patients are still encouraged to engage in daily life, by participating in various activities such as cooking or cleaning for example. A study of these groups did not find a difference in the overall or cognitive decline, although it did suggest ways of achieving possible benefits in terms of quality of life in particular (41). In regard to quality of life, the results vary according to the studies, with some apparently showing a more rapid decline in the specialized units (25), while others show a reduced rate for this decline (9, 26). Another study did not find a difference in the quality of life, although it was only in regard to newly institutionalized patients, and the lack of a delay may hence partly explain this result (27). These contradictory findings can no doubt be explained by the fact that the patients in SCU exhibit pathologies that trigger a faster cognitive decline, and the specific care that is provided is not enough to sufficiently slow it to the point where they become comparable to the rest of the population.

Depending on the studies, aggressive behaviors were constant or decreased over time in SCUs (27, 43).

Studies regarding nutrition do not appear to show a difference in terms of the nutritional status of patients in SCUs and n-SCUs (13, 16). Nonetheless, it appears that Alzheimer’s disease constitutes a risk factor for malnutrition (44, 45). Thus, the lack of a difference could be interpreted as a positive result. The fact that patients are not more malnourished in SCUs than in n-SCUs could be due to more personalized treatments in SCUs.

Specialized units can, however, also be the source of difficulties for the medical and paramedical staff that have to treat these patients. At times these patients exhibit major behavioral issues, making the work conditions harder, and this can lead to work-related stress than can develop into burn-out. It has been shown that the application of specific care programs allowed these risks to be reduced (46, 47). These hence ought to be implemented in a manner that is concurrent with development of these facilities. Indeed, a part of the cognitive degradation by patients appears to be linked to a

negative influence of the environment, and the attitude and behavior of the staff in particular (48). It appeared to be the case however that SCU teams are more trained in managing behavioral issues, which engendered less stress than with the teams of the n-SCUs for the treatment of an equivalent situation (35). More surprisingly, the prescription of psychotropic agents could be influenced by conditions of work-related stress (32). The overall increase over many years in the prescription of psychotropic agents is also partly due to institutionalization of the most severely affected patients in an ever aging population, particularly in specialized care units (31). Use of physical restraint when alternative solutions are not effective has also been studied. The studies have shown that patients afflicted with advanced neurodegenerative pathologies are more often subjected to these situations. Thus, in light of the limitations in regard to the number of patients who can be accommodated, SCUs sometimes end up selecting the most severely affected patients.

Interventions like Dementia Care Mapping are in fact used to prevent this risk. Evaluated in Germany, these studies have shown that this type of intervention does not have an impact in terms of cost relative to conventional care, and that it allows for fewer hospitalizations (49).

At the medico-economic level, the opening of an SCU was evaluated and it was found to have several consequences. It would appear that occupation rates improve, and there also tends to be a switch from public to private financing (50). As a result of the introduction of a system of mixed financing, these changes allow for further contribution to the development of such facilities.

Limitations of the included studies

Some studies that yielded results that differ from those described in this study were not included in light of the selection criteria for the articles, particularly in regard to the time limits that were chosen.

The definition of the specificity of the treatment of dementia patients is not the same between countries, and hence comparison of the treatments in these countries is difficult. Furthermore, even when criteria for defining SCUs exist, these guidelines are not always adhered to (51). This problem is more substantial when the treatment defined in a certain country changes progressively over time. The contradictory results of studies can hence be explained in part by this problem. A systematic review carried out in 2009 provided evidence for this problem, suggesting that a higher level of rigorosity should be adhered to when performing studies, both for the description of the treatment of SCUs, as well as for the evaluated criteria (36). The criteria for assigning a patient to a SCU also vary, although the majority of clinical evaluations of patients are increasingly being done using a validated scoring system or scale.

In terms of methodology, certain studies compared differences in treatment over very short time spans, while

others had cohorts with numerous patients who were followed for several years. Given the evaluation criteria, which often evolve over several years, the conclusions of some studies hence need to be qualified, and a difference could not always be shown.

Strengths

This review allowed the existing practices to be summarized in order to shed light on the strengths and shortcomings at a time when optimization of treatments is an issue. It was carried out by following the PRISMA criteria so as to make the methods that were used reproducible and reliable.

The majority of studies only published positive and statistically significant results, while some of the less clear or robust results have no doubt been ignored to date.

In conclusion, by specifically considering only the more recent studies, this work has allowed knowledge of the merits of development of specialized units to be updated, particularly in terms of the treatment of dementias. In light of the current acceleration of the overall aging of the population and the fact that national health policies are aimed at anticipating and better addressing what constitutes a major public health issue in years to come, the results of this study are a timely confirmation of the benefits of specialized dementia care units, although this still needs to be demonstrated conclusively. Longitudinal studies of sizeable cohorts clearly appear to be in favor of SCUs, both for the patients in terms of preservation of quality of life or the quality of the treatment, and for the care staff, who are better trained and hence better able to provide support to patients in need of specialized care at the end of their lives. The definition of the precise criteria of SCUs within a single country or at the international level would allow for a better comparison of the results, and hence confirmation of less robust conclusions based on interventional trials.

Conflict of interest: ???????????

Ethical standard: ?????.

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