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The Alzheimer's Patient in the Emergency Department — Specificities of Care

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1. Introduction

In Belgium, like in almost all other European countries, Alzheimer's disease affects a growing number of people as our western population is growing older and the life expectancy is expanding.

We estimate the prevalence of AD to 800.000 people in France and 420.000 people in Benelux (Belgium, Netherlands, Luxemburg).

Although the prevalence is very low before age of 70, it exceeds 20 % of men and 30 % of women after 90 years old [1].

Alzheimer's disease has a heavy impact on physical, psychological and social equilibrium of the patient and his family. Alzheimer's disease has still a bad image in the society, because it is described like a slowly progressive but inexorable illness, affecting not only intellectual abilities, but also physical integrity.

Beyond the basic care, the Alzheimer patients need from professionals a specific support, which implies a better knowledge of the illness and listening skills of the patient and his family.

Alzheimer's disease patients need regularly to be hospitalized, and the emergency room is their main way to be admitted to the hospital. However, the lack of knowledge of professionals on Alzheimer's disease induces suffering for the patient and his family, as they are too often considered as heavy and non-cooperating patients.

The purpose of this article is to give some useful bases to inhospital caregivers who are confronted to Alzheimer's disease patients, especially in emergency unit.

2. Alzheimer's disease

Alzheimer's disease is the most frequent cause of dementia, accounting for 50% to 60% of all cases. It is a neurodegenerative disease, which affects cognitive functions, psychological and behavioural balance. Alzheimer's disease is a neurodegenerative disorder in which two proteins (amyloid- β and Tau) undergo pathological changes, consisting in brain accumulation of an insoluble form of amyloid- β , and in hyperphosphorylation of the tau protein with modifications of the stereotactic configuration. Although the exact chronology and interaction between these proteins is still debated, it is generally accepted that these alterations arise years and probably decades before the appearance of any clinical symptoms [2]. Thus, physiopathology associated an accumulation of beta amyloid peptides in senile plaques and tangles (induced by tau protein abnormalities) in the neurofibrils with lipid oxidation and peroxidation, glutamatergic toxicity, and on inflammation, leading to neuronal apoptosis. Another physiopathological change concerns

Other physiopathological change concerns possible heavy metals accumulation, vascular or infectious processes... Finally, there is an increasing evidence that vascular dysfunction plays an important role in the clinical decompensating Alzheimer's disease [3].

Its course is slow, insidious and lasts for years.

Psychological and Behavioral Symptoms of Dementia (BPSD) may appear at any time of the disease but usually appear later in its course. They can represent loss of initiative to manage daily activities (apathy), changes in the personality (irritability, paranoiac thoughts, delusions) or changes in the mood and the behaviour (anxiety, depression, aggressiveness, appetite disorders, wandering). Noteworthy, sleep disorders, depression and anxiety or even apathy may all emerge before the onset of cognitive symptoms in many cases.

Finally, the neuronal loss is high and more physical neurological syndromes emerge (epilepsy, walking disorders, higher risk of falls, immobilization, swallowing disturbances, malnutrition and dehydration).

As for many syndromes, the clinical diagnosis is based on different criteria [4,5].

First, the patient's and family's anamnesis informs the clinician when and how the disease began, how it evolves and if it has a negative impact on daily activities.

The personal and familial history, socio-educational and co-morbid features will complete the history.

Biological tests can be restricted to those allowing to exclude pathologies interfering with cognition, for example folic acid or vitamin B12 deficiency, dysthyroidism, ionic and metabolic disorders. When the clinical features or history suggest syphilis, HIV or borreliosis, specific serologies should be performed.

Cognitive assessment should be completed with a validated screening test, such as a Mini Mental State Examination (MMSE) [4]. Space-time orientation and immediate memory represent 16 points of the total 30 points. In case of doubt, a total score equal or over 24/30

should be followed by a comprehensive cognitive assessment performed by a neuropsychologist. It emphasizes multiple cognitive disorders and helps the clinician to define the diagnosis as best as possible.

Brain neuroimaging (CT scan, magnetic resonance imaging) completes the workup. It detects potentially treatable cerebral lesions (tumors, hematoma, hydrocephaly,...), and associated causes (vascular lesions). It also gives anatomic indices to describe specific Alzheimer features (ie hippocampic atrophy).

Functional neuroimaging (Pet Scan, SPECT) explores topographic hypometabolic zones, helping to approach the diagnosis when clinical features are unusual.

Finally, lumbar puncture is a complementary diagnostic tool, it allows to confirm the diagnosis if the clinical presentation is more atypical: low levels of b-amyloid 42 and high levels of tau and phosphotau protein seem highly sensitive and specific (80%) to Alzheimer's disease.

When the diagnosis is defined, the Alzheimer's disease management should begin with the announcement of the diagnosis to the patient and his family. It is important to take into account the patient's anxiety related to the delay of the disease announcement itself to find the good moment to announce it. Most of Alzheimer patients wish to be informed of their diagnosis (72 to 96% from one study to another) and 7% of caregivers wish their parents to be informed from what they suffer, to respect his/her autonomy of decision [6,7].

The information on the disease must be clear, concise and should focus on the course of illness, its main comorbidities, the need to provide more help for daily activities...

It is also important to talk about medicolegal issues, such as the ability to drive a car, to set up a personal property manager.

The caregiver approach should consist in a specific education on the illness, whether for the basics or a true course called « psychoeducation ». A study demonstrated that a caregiver's specific training delays the time of institutionnalization until 500 days [8], and decreases the risk of caregiver's mood disorders [9]. An American study showed that a daily home caregiver to help the main caregiver lowered the number of hospitalizations, the length of stay of demented patients [10].

The treatment consists in a global approach; pharmacological and non-pharmacological approaches should always coexist.

Two drug classes are currently available; cholinesterase inhibitors (donepezil, rivastigmine, galantamine) and N Methyl D Aspartate receptor antagonists (memantine). Although they have only a minor effect on the course of the illness, cholinesterase inhibitors are actually recommended in mild to moderate Alzheimer's disease.

A French study showed that Alzheimer patients treated by cholinesterase inhibitors are later institutionalized than those not treated [11]. Memantine has a greater protective effect on memory in later stages of the disease, and it seems to have a positive impact on some behavioural disturbances [12,13]. The combination of the two classes is probably promising, further studies are expected to confirm it clearly.

The treatment of behavioural and psychological and social disorders needs to first identify the triggering and/or worsening factors (environmental factors, organic causes such as pain, constipation, infections; iatrogenic causes and depression).

Non-pharmacological approach includes different therapies: aromatherapy, musical therapy, physical exercises... Until now, none of these therapies have been shown effective, due to the lack of reproducible methodology from one study to another [14].

If necessary, neuroleptics can help to manage BPSD, following the rule « the lowest dose, the shortest time » as possible, to avoid adverse reactions (drowsiness, falls, extrapyramidal syndromes) and its bad impact on quality of life, wellness feeling, and the risk to worsen cognitive disorders [15,16].

3. The caregiver's burden

Formal caregivers, (spouses or children), informal caregivers (neighbours, friends, home care nurses) suffer from the « collateral distress » of Alzheimer's disease. This is influenced by the lack of knowledge on the illness, its course and its prognosis. Moreover, caregivers are often the first who refer their proxy to the memory clinic, because they suffer, without knowing why: they feel « abnormally exhausted ». Studies show that caregivers suffer more from anxiety, depression, and alcohol abuse and have a higher risk of mortality [4].

At the diagnosis announcement, different kinds of reactions are observed.

Some of them deny it. Some others tend to be more protective with the patient, and are usually hyperinvesting in the care of their parent.

Sometimes conflicts appear between the patient, his family and the institution of care. It is particularly true if the family feels guilty and ambivalent toward their parent and because they refer the heavy task on care people.

Before the patient will be referred to a nursing home, the main caregiver must be psychologically and physically sustained by a trained team, and he must be informed on the possibilities to have periods of rest during the course of the illness.

Home care should be strictly organised and adapted from the beginning until the end of the course of the disease. Even after the institutionalization, the family should be followed specifically.

Advanced directives for the patient could also be discussed with them.

Though defined as a chronic disease, the disease progression to terminal illness is rarely recognized as a « palliative process ». An American study followed 300 institutionalized Alzheimer's patients and their proxies during 18 months. 55% of the patients died during this period; 41% had pneumonia, 52% had fever episode, 85% had problems to eat alone. In emergencies, 46% had dyspnea, 39% experienced pain. In the last 3 months of life, 40% had

experienced « aggressive therapies »: they were hospitalized; they were referred to an emergency department, or even underwent artificial nutrition.

When patients and their proxies had been well informed on the prognosis and the course of the disease, patients had a more worthy end-of-life experience [17]. It emphasizes the importance to educate the care staff, whether for home care, hospital care or nursing home care [18].

4. The patient with dementia at the emergency department

Among patients older than 60 years old admitted in emergency department, 13% have cognitive disorders. When they are admitted at hospital by another way, only 8% have cognitive problems [19].

Most of time, the urgent admission of a demented patient is more justified by the lack of structural or human support than the acute illness itself: the emergency room becomes the only « wipe out » for burden families, sometimes also for burden professionals in nursing homes.

More, literature reports that proxies express very few their wish to find an alternative structure to take care of their parents [20].

The reason of admission is most often a somatic problem.

In a prospective study conducted by B Vellas et al, the two first causes of admission of demented patients in emergency wards were behavioural disorders (26,3%) and falls (18,6%) [21].

A retrospective study in United Kingdom, between 2002 and 2007, showed that demented patients (20% Alzheimer, 11% vascular dementia, 69% not defined in the medical file) were more frequently admitted via the emergency room than non-demented patients. The diagnosis of dementia is rarely evoked in the file (6-10%). Most are hospitalized for somatic problems (syncope, pneumonia, urinary tract infection, dehydration) and more significantly than non-demented patients [22].

In a French study (REAL.FR), investigators followed 516 patients with light to moderate Alzheimer disease during one year. 27% of them were hospitalized at least once. Predictive factors of hospitalization were: caregiver's burden (the most frequent), loss of autonomy in one or more basic daily activities (Katz scale) or in two or more instrumental daily activities, the presence of at least 2 current illnesses, depressive disorders, polypharmacy, disinhibition, delirium, score > 5 on Reisberg's illness rating scale (moderate dementia or severe cognitive decline) and the need for external help for housekeeping [23]. After 2 years of follow-up, predictive factors of rehospitalisation were need for basic daily activities, caregiver's burden and high level of BPSD based on NPI scale (Neuropsychiatric Inventory) [24].

In case of real emergency, the GP should refer the patient with a detailed file containing medical and dementia history, current medications, and a brief summary of home care providers'

journal, to distinguish chronic and new symptoms. For example, alteration of vigilance is a challenging situation with a broad differential diagnosis: an underlying acute medical illness, epilepsy, drug intoxication, delirium should always be excluded.

It is important to note that most of common pathologies associated with advancing dementia have an underlying illness that needs a specific causal treatment.

Bradshaw et al studied 250 patients aged over 70 with a co-morbid mental health problem and followed them up for 180 days. Twenty-seven per cent did not return to their original place of residence after the hospital admission, and 31% had died after 180 days. Significant predictors for poor outcomes were co-morbidity, nutrition, *cognitive function, behavioural and psychiatric problems and depression* [25].

Medical doctors working in the emergency unit should avoid the use of neuroleptics, or other sedative drugs to treat delirium and BPSD, and a non-pharmacological approach should always be proposed. This implies that any new problematic symptom, including agitation, delirium, paranoia, hallucination, and anxiety ... should preferably be managed in collaboration with the physicians who know the patient and the course of the disease. A conservative and comprehensive management of the probable cause of the problem (loss of senses such as sight or hearing; changing habits or care behaviour,..) is the most appropriate.

When drug will be offered, causal effect treatment with the fewest side effects is preferred. It is particularly important to pay attention to any anticholinergic effects and to possible interactions with other medications.

In all cases, we should also exclude organic cause (metabolic disorder, including urinary infections, subdural hematoma in case of fall or even the occurrence of new epilepsy...) before considering the appropriate treatment.

4.1. Delirium and dementia

Delirium is very common in elderly patients admitted in the emergency unit. Risk of delirium is higher for demented patients. It is sometimes the first symptom leading to the diagnosis of dementia.

Most of the time, causes of delirium are not purely neurological and toxic, metabolic causes (hypoglycemia, anemia, heart failure), drugs interactions, current infections or pain have all to be tracked.

Features of delirium are characterized by altered vigilance status, cognitive disorders not related to previous cognitive state, symptoms of rapid onset and fluctuation and a strong evidence of underlying organic disease (DSM IV-TR) [26]. Demented patients with delirium are less able to explain their symptoms than non-demented patients and than demented patients without delirium. They have more difficulties to understand explanations and diagnosis delivered by professionals in the emergency ward [27]. Moreover, delirium in urgent situations is a prognostic factor for loss of autonomy: according to a study of Vida, delirious

patients lose more autonomy than non-delirious patients [28]. Finally, delirium is an independent prognostic factor for length of stay and risk of mortality at 6 months [29,30]. In the absence of altered mental status, this syndrome might be missed unless it is actively looked for using a validated delirium assessment.

The environment of the emergency room is seldom adapted to patients with delirium: people have to wait several hours to be managed, rooms have no windows, there is no time markers in the rooms (no clocks, diaries), meals are served at every hour night and day.

It is therefore important to screen for delirium: the most used screening is CAM (Confusion Assessment Method) [31]. Health care providers in emergency units have often not enough time to assess completely the situation, to communicate efficiently with the patients and to take care of their needs.

In front of patient with acute or subacute delirium; fluent aphasia has to be excluded. It could be interpreted as confusion. If the onset of aphasia was sudden, brain imagery and electroencephalogram should always be done.

Management of delirium involves ensuring safety, improving functioning, identifying and treating the illness underlying the delirium, and use of antipsychotics or benzodiazepines to control behavioural symptoms and prevent mortality. Haloperidol, an old typical neuroleptic is the most commonly used antipsychotic in delirium. Atypical antipsychotics may be as efficacious as haloperidol in the treatment of delirium, but have less side effects [32]. In addition, to restore good quality of sleep and normal circadian rhythm, the use of melatonin can sometimes help. Anticholinesterases or memantine have few impacts on delirium in emergency cases [33]. However, their chronic prescription could decrease the risk of delirium and BPSD in dementia especially in case of Alzheimer disease.

Non pharmacological approach in emergency units would consist in faster management of the patient in quiet rooms with windows, clocks and calendars should be implemented. Beds with barriers, with comfortable mattress should be proposed.

4.2. Paranoia and dementia

Paranoia is a manifestation induced by excess of dopaminergic metabolites. As for other delirious ideas, it can also result from errors of interpretation or of reasoning, especially in dementia (objects lost interpreted as stolen...) [34].

In combination with a decrease of dopaminergic drugs, a conservative treatment has first to be considered. Anticholinesterase and memantine have both a top-grade places to avoid as far as possible the use of neuroleptics in terms of side effects, particularly in case of dementia [35-37]. Sometimes, trazodone 50 to 200 mg/day can help [38].

However, in emergency and only during the acute phase, haloperidol 1 to 4 mg could be proposed. But, in case of chronic use, new generation of neuroleptics (quetiapine for example) should be preferred with the necessity to track any extrapyramidal signs and to adapt the treatment very regularly.

4.3. Depression and dementia

Depression is frequently associated with dementia either as a triggering factor of the disease or as its consequence. However, depression is rarely the cause of emergency admission in case of dementia. If suicidal risk should be systematically screened, its arisen is exceptional perhaps as a consequence of memory disturbances, mood and cognitive fluctuations. Planning and executive difficulties could also explain the low rate of suicide in demented patients. Impulsive suicidal acts are nevertheless possible. Depression influences cognitive and functional capacities of all individuals, demented or not. This is of particular importance in case of minor and major neurocognitive deterioration, and it should be systematically screened and treated, in order to improve the quality of life of the patient and its caregivers, and to preserve the patient's residual functional and cognitive capacities. The preferential choice will then consider a drug with as least as possible interactions with other concomitant medications (often a selective serotonin reuptake inhibitor), taking into account the impact on appetite and sleep of the patient. A recent meta-analysis showed that psychological interventions associated with antidepressive drugs can reduce symptoms of depression and clinician-rated anxiety for people with dementia [39].

On the other hand, any caregiver's depression should be aggressively pursued and handled in view of its great incidence and of its heavy impact.

Nevertheless, we can't underestimate the ability of emergency caregivers to communicate with demented patients: Eder points out their need of knowledge of dementia, ie the different kinds of dementia, its progression, its symptoms, in order to communicate and manage adequately these patients [40].

Restraint is also a frequent ethical problem in emergency units. It raises ethical questions to all of us but especially to caregivers: « Should I respect the patient's autonomy, if he is in danger for himself or for others? How to justify it? » [41].

Finally, the length of stay in emergency unit depends on the downstream bed availability. Time spent by caregivers to find a bed is also wasted time to communicate with the patient.

Therefore, the management of these patients must be lead by an interdisciplinary approach. Nevertheless, in some countries like France, only 20% of hospitals have a geriatric unit. There is then an urgent need to sensitize medical hospital managers and policy makers to improve the geriatric offer in terms of acute settings.

At a medical level, the emergency physician should work together with geriatricians to understand how to integrate the acute illness into the patient's geriatric syndromes.

It is therefore useful to define a care pathway for the demented patient, from home care to hospital management.

We could imagine to apply to emergency units what already exists in terms of technological innovation for home care of elderly (demented) patients: for example, the European HOPE project (Smart Home for Elderly People) aimed to improve communication and information

to proxies to take care of their elderly demented parent; this system helped to maintain quality of life, and to improve health care, security and communication with the patient [42].

5. Proposition of a care pathway of demented patients

The general practitioner (GP) is the first health care provider involved [20]. He should be trained to inform families of the dementia's symptoms, their expected evolution and their potential complications. This is first, to prevent crisis and proxy's burden.

A crisis is an episode of acute disorganization with symptoms that lead patients and their caregivers to call an emergency care help. It refers to a sudden change in the course of the patient's and family's habits, while it is very important to maintain them stable for dementia's stability [43].

It happens too often that patients are admitted to emergency units on the request of GP, without evident urgent situation. When the problem is not urgent, the GP should refer the demented patient to geriatric or neurological consultation, or to the geriatric day hospital.

We developed in Belgium a specific care program for the geriatric patient which could offer alternative approach for the demented patient: since 2007, Belgian hospitals had to develop pilot projects for geriatric day hospitals, internal liaison (mobile team for geriatric patients hospitalized in other units than geriatric departments) and external liaison with home care and nursing home care providers. The referring GP contacts the coordinator of the geriatric care program and they decide together when and how to admit the patient at hospital, in order to avoid the mandatory passage to the emergency department if the patient doesn't require urgent care. It allows also providing counselling on how to adapt transiently home care.

6. Conclusion

Alzheimer's disease is a frequent pathology. It would be considered as a pandemic illness in the future 20 years. As the demented patient is often admitted at hospital by the emergency unit, it is crucial that emergency caregivers have the best knowledge of the disease, to offer the best adapted care, to support family and to avoid unnecessary admissions.

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