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**Articolo originale**

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**PAIN IN PATIENTS WITH COGNITIVE IMPAIRMENT**

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**Abstract**

*For its high prevalence (80%) the chronic pain in the elderly can be considered a real social disease. But studies in literature are in agreement in showing that it has been under diagnosed and under treated in patients with dementia compared with non-demented of the same age. Moreover, in patients with significant cognitive impairment, it is not simple to diagnose the presence of pain being less self-denunciation of the same demented and being, therefore, required a 'careful clinical examination that looks for signs rather than symptoms. The tools for self-assessment of pain in the elderly with mild to moderate cognitive impairment do not differ from those in use in the young. For severe dementia have been developed "hetero-evaluation tools" that take into considerations visible signs of pain though hardly quantifiable. For example, the state of agitation of the patient with dementia who does not know how to express his pain, shows it in this way and, if misinterpreted, it is treated with tranquilizers very unlikely to remove the state of pain, but ends up causing further deterioration in the cognitive status of the patient. Moreover, as regards the treatment of pain in patients with cognitive impairment, in consideration that the most frequent cause of pain in patients with dementia is represented by osteoarticular, neurodegenerative and vascular diseases, which, almost always, are associated with a depressive state, the best treatment is the use of antiepileptic and antidepressants drugs, perhaps associated with opiates in their various forms that are also very useful in the control of the state of agitation and insomnia in patients with dementia and are easily associated to the drugs commonly used for the control of cognitive impairment such as acetyl cholinesterase inhibitors and memantine.*

**Keywords:** Pain, dementia, analgesia

Among the symptoms, pain is the most subjective and the most influenced by psychological, social and environmental variables. Since this is a subjective experience, it can be assessed only indirectly through what the person communicates verbally or not verbally about his experience. Therefore, pain assessment is a process not easy to perform, but indispensable for the treatment of pain itself, which, as stated in 2002, "Joint Commission on Accreditation of Healthcare Organizations standards manuals" it is the "fifth vital sign" to detect for an adequate patient care. (1) Its prevalence in the elderly is certainly high: about 80% of elderly people suffer from a chronic disorder that causes pain (2), but it varies depending on the age (increases with age) and the healthcare setting (3) (4): 20-50% in no-institutionalized patients, 40-80% in those institutionalized. (5) (6). The wide variability in the prevalence studies is certainly linked to the difficulty of diagnosis of pain in the elderly, who, as demonstrated by a Dutch study, communicates less the pain to the GP compared to the youngest (7) and to aggravate the clinical picture and, therefore, the diagnosis take over the social, psychological and emotional problems such as grief, depression, disability, poverty that can affect the experience and the expression of pain. Its prevalence, in fact, increases with the worsening of the level of functional dependence and situations of loneliness and widowhood (8) (9), but, in turn, the presence of severe chronic pain prevents the normal course of daily activities causing: depression, isolation, sleep disorders, difficulty in movement and gait increasing the cost of use of health services. As said, the pain in the elderly is certainly under diagnosed and treated: only 25% of the elderly with pain and cognitive decline or over the age of 85 years receives an analgesic treatment. (10) The elderly with cognitive impairment in particular have 1.5 times more likely not to receive an analgesic treatment compared to those who are cognitively intact (11) (12) and those chances increase further in patients with chronic pain (13) (14). The presence of cognitive decline, then, becomes a predictor of failure to control pain, mainly because of the difficulty of assessing the presence and the widespread belief that, with age and with the onset of dementia, it is determined a reduction of its perception and intensity. In fact you do not know exactly how the age or dementia can change

the perception of pain nor the results of experimental studies on the variation of the threshold of pain gave unequivocal results on the matter. (15) (16) Some clinicians transfer to nociceptive sensitivity what generally occurs with aging to the auditory and visual sensitivity, which would suffer, therefore, a parapsychological decline (Presbialgia) and, in practice, consider the elderly with a reduced sensitivity to pain compared to the young. Ferrel and Singing (17) (18) reinforce this prejudice by stating that the threshold for pain would be higher in the elderly, hence the lower incidence of pain in AMI elder especially if demented. While, in 2003, Edwards showed in a study that inhibitory mechanisms of nociception are less represented and valid in the elderly and this would lead to a greater intensity of pain experienced. (19) As Pickering says, in the elderly there is less sensitivity to light algogenic stimuli, but more with the darker ones. (20) In his studies on the matter, then, Gibson evaluating the potentials evoked in experimental pain, has shown that there is no difference between young and elderly subjects, even in presence of cognitive impairment. (21) This thesis is supported in a review made by Kunz in which he says that there are no differences between the threshold of pain and potentials evoked by the same among individuals with Alzheimer's and those cognitively healthy. (22) Finally Scherder in his review of 2003, pointed out that there may be differences in sensitivity to pain according to the various types of dementia: in frontotemporal it would reduce the affective component of pain that would be increased in the forms of vascular dementia. (23) Actually, there are no consistent scientific data showing a different elder sensitivity to pain compared to the young, albeit suffering from cognitive impairment. What differs, instead, is often the way of expression of the same.

Certainly, however, the pain diagnosis in the elderly is made more difficult by a number of factors that prevent the recognition. They are divided into:

#### Patient factors

- sensory (visual-acoustic) and speech (dis / aphasia) difficulties
- acute or chronic disorders of consciousness (delirium, dementia)
- error interpretation (confusion among pain / suffering / functional limitations)
- memory deficit (24) (25)

- age and gender (underestimated pain in over 70s and in males)

- social and cultural differences (almost “due to age” pain) (26)

Factors related to the family

- denied not to “suggest” to the patient the presence of pain

- fatalism (considered inevitable pain in the elderly)

- prejudice in the use of opioids.

Factors related to health care providers

- fragmentation of care (only 70% receives analgesics, of these only 60% correctly) (27)

- training and operators sensitivity (especially in general hospitals and Geriatric hospital) (28)

a) Professional Role (disagreement among doctors and nurses: in agreement for 32% the medical departments and 44.5% in the Geriatric hospital) (29)

b) Age and sex of the health care (doctors and young women are more careful to treat pain) (30)

c) Personal experience of pain (7) (31)

d) Lack of specific and time interest (26)

In 2001 the European Federation (EFIC) said that although “acute pain may reasonably be considered a symptom of disease or injury, chronic and recurrent pain is a specific healthcare problem, a disease in and of itself.” (32) Therefore, not diagnosing and therefore do not treating chronic pain, involves, as with any other illness, particularly severe general (deficit of walking up to lodging; dyspnea; blood sugar imbalances; an increase in cortisol and glucagon; sedation; incongruous treatments; sleep disorders), social (loneliness, health care costs) and psychological (depression, anxiety) consequences for the elderly. (24, 33, 34-36)

However, recalling that for the OMS pain is defined as “an unpleasant feeling and emotional experience with a negative affective tone ...” It follows that, in the absence of cognitive disorders, of pain and the diagnosis of the causes which determine it, it does not differ in the elderly compared to the adult, the same also applies to patients with dementia from mild to moderate grade, however, is generally able to report and describe a pain and is, therefore, appropriate to give them a chance to report it : the gold standard for the assessment of pain in these patients, is the reported patient (Wheeler 2006). So it’s worth groped a verbal approach

addressing their simple questions that investigate the following aspects:

- Location of Pain
- Severity / intensity of pain
- What exacerbates the pain
- What soothes the pain.

The patient with severe dementia, however, is not able to answer such questions; it is therefore essential an evaluation by a third party (hetero) assessing the presence of those that are the direct and indirect signs of pain and they are represented by:

1. Facial Expression
  - a. mimic and angry and empty look
  - b. distorted face
  - c. lip closure
  - d. mouth wide open
2. Issuance of nonverbal sounds (mourning, crying and screaming)
3. Muscle tension (general or localized)
4. Modification of behavior. Agitation b. Prostration c. Refusal of care
5. Sleep or appetite changes
6. Respiratory Symptoms
  - a. polypnea
  - b. apnea
  - c. sighing
7. Cardiovascular Symptoms
  - a. sympathetic
  - b. parasympathetic
8. Skin symptoms
  - a. pallor
  - b. cold sweats
  - c. gooseflesh

Considering, however, that, in the most severe forms, even the hetero-assessment becomes difficult for progressive functional limitations, the worsening of the autonomy and the reduction of non-verbal expressions of pain.

In any case, they are a useful guide to the rating scales of pain sensing that besides facilitating the diagnosis, allow both the monitoring over time and the evaluation of the therapeutic and care interventions. They are classified as self-assessment scales and hetero-assessment. The first are the most simple and reliable as it is the patient himself who judges the symptom and are primarily used in adults and elderly, non-demented or from mild to moderate forms. They are divided into generic (dimensional) and complex (multidimensional).

The one-dimensional self-assessment scales are represented by:

1. Verbal Rating Scale (VRS) is the easiest with the greatest likelihood of completion. Those preferred by the elders, the last self-assessment tool for use in dementia. (17)

2. Faces Scale. Understandable only by 20-30% of Pz with moderate dementia. (34)

3. Visual analogue scale (VAS). Reference tool for adult pain, not valid in Geriatrics, requires intellectual abilities of abstraction. Not useful in demented. (36)

4. Numerical Scale (can be used from mild to moderate dementia) (24)

5. Thermometer Pain

The multidimensional self-assessment scales are represented by:

1. McGill Pain Questionnaire (1975). Feasible in 2/3 of Pz with mild dementia, but with high level of education in that it uses a complex language (37)

2. Verbal Descriptor Scale. Easier to use for a simple vocabulary. Its use is limited in demented. (38)

The stairs simple verbal self-assessment, then, are the most used ones from mild to moderate dementia patient before resorting to those of hetero-assessment, but their main limitations are as follows:

- They require a minimum of verbalization (Yes / No)

- The evaluation must be contextual to the possibility of amnesia in case of intermittent pains

- The answer can be automatic or suggested (positive for positive question and vice versa).

The scales of hetero-assessment, then, are indispensable when the self-evaluation is no longer possible or reliable. It appears clear the difficulty of objectifying a feeling not expressed directly when a third person evaluates the pain of the subject under consideration. Even the hetero-assessment using tools (scales) are standardized and validated, but not in all countries and for all subjects. These scales consider different behavioral and physical components of the subject under consideration, potentially indicative of pain, assigning them a score, such as vocalizations, facial expressions or body, defensiveness or abnormal, behavioral or psychological changes. It is calculated an overall score for the various items. Exceeded the minimum point value, the scale would be indicative of the presence of pain. These scales have importance in detecting the presence of

pain, but not in the quantification of the same. Therefore, it makes no sense to compare the scores of different patients; it can, however, be useful to compare the score obtained at different times in the same patient to evaluate the progress of the disease and especially the effectiveness of analgesic treatment. Zwakhalen in 2006 in his review analyzed the international literature from 1988 to 2005 comparing with each other 12 observational scales for pain assessment through a series of psychometric qualities and criteria regarding sensitivity and clinical utility, such as: type of variable and score of the variables origin, number of subjects evaluated for validation, validity, consistency, reliability and applicability. Of all the Doloplus2 Lefebvre-Chapiro 2001, the Pain Assessment IN Advanced Dementia (PAINAD) Warden of 2003, the Echelle comportementale pour personne âgées of Desson of 1999 (ECPA) and the Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC) of Hadjista-vropoulos of 2002 are the tools that best match the quality and the criteria considered. In the review by Herr in 2006, however, the scales with the best psychometric quality assessment were found to be the Discomfort in Dementia of the Alzheimer's Application type (DS-DAT) Hurley in 1992 and communicative Not Patient's Pain Assessment Instrument (NOPPAIN) of Snow in 2004. Comparing the two revisions the most appropriate tool in the assessment of pain in patients with severe dementia was found to be the Doloplus2. It stems from a pain rating scale used in children and consists of 10 items divided into three areas that investigate:

- somatic reactions: complaints, analgesic positions at rest, protection of hurting areas of the body, expressions of pain, sleep disturbances.

- psychomotor reactions: patient's behavior during the hygiene and while wearing or removing clothing, motility.

- psychosocial reactions: communication, social, behavioral disorders.

Scores attributed to each item ranging from 0 (absence of behavior that expresses pain) to 3 (highest expression of behavior that is associated with pain) and their sum varies in a range from 0 to 30. A total score equal to or greater than 5 indicates the presence of pain. This scale has been widely tested in the field, in various populations of older people with dementia patients in nursing homes, rehabilitation centers

and hospices on large series. Easy to use for the clarity of instructions for each item, has a good sensitivity (minimum number of false negatives) even if of a lower specificity (risk of false positives). It requires a good knowledge of the patient as it does not describe a single unfortunate incident, but reflects the course of the pain over a prolonged period and this would be more useful in the RSA and long-term care. Unfortunately there is no validated form in Italian and this is an important limitation to its application in our care reality. American PAINAD, however, is available in Italian language. (38) consists of 5 items: breath (independent of vocalization); negative vocalization (lament, scream, cry); facial expression; body language; receiving comfort (reaction of the subject to the intervention of the operator or caregiver designed to distract or provide reassurance with words and touch). Each item is rated on a severity scale where 0 corresponds to the absence of behavior that expresses pain, 1 occasional presence or moderate the behavior that expresses pain, 2 to continue or severe manifestation of behavior that expresses pain. The range of the scale is from 0 to 10. At higher score corresponds to the most severe pain.

In order to outline what has been said, the hetero-assessment scales have advantages and disadvantages.

Advantages:

1. Focus on the use of less subjective and more specific items than an unguided observation.
2. Allow a comparison of the observations of the same patient by a team.
3. Facilitate the awareness and training of the treating.
4. Stimulate research and scientific interest in this field.
5. Allow the comparison between feedback of the same patient over time and after treatment.

Disadvantages:

1. They are generic and their items are not adaptable to different situations / people.
2. They are only standardized and validated for the population tested within a country.
3. The score can be influenced by personal experience and by the evaluator sex.
4. They can delude ourselves that the hetero-assessment is easy to use.
5. They can delay the use of diagnostic tools.

6. They can also lead to their overuse also in those cases in which there should be used those of self-assessment.

7. There cannot be compared the scores among different patients.

8. It is in addition to many other scales in use.

To improve the use of scales for the purpose of early diagnosis and correctly estimated the pain is good to respect some practical advice:

- Environmental conditions of the visit (setting): silence, good illumination of his face; stay at the same patient level; use gestures to indicate the painful area and a virtual visual-verbal pain score.

- Formulate short, simple, positive questions by using articulated words accurately separated one from the other.

- The interviewer should not always be the same (certain faces or voices are more effective than others).

- The interview must be accurate and repetitive as accurate must be the observation of non-verbal communication.

- The physical examination should be so accurate as the Pz presented polytrauma with emphasis on osteoarticular apparatus and the skin (bed sore).

- Any change in behavior (stress, discomfort) should suggest the presence of pain.

- It 's always helpful to look at the signs: verbal, facial, adaptive, distractive, postural, protection of painful areas, reactions to stress, reactions to the toilet and dressing up by themselves or with help, social changes, behavioral disorders, autonomic (sympathetic and parasympathetic).

- Compare these signs of previous patient demonstrations in case of stress.

- Document the observations of each new sign interpreted as suffering.

- Empiric analgesic test in case of doubt about the possible presence of otherwise expressed pain as recommended by the American Association Gerontology.

So, in order to summarize what has been said so far, we can say that the elder pain is the product of more potentially debilitating chronic conditions, bone, joint, vascular, psychological and social factors that can modulate the perception and response to pain. In Alzheimer's dementia the somatic sensory cortical areas of the patient are stored and is then maintained

the ability to perceive the acute painful stimuli, although, often, the subject can not express them. In more advanced stages of dementia, memory disorders are so severe as to prevent the demented the memory of pain: in these cases it is impossible the experience of chronic pain and the Alzheimer sufferer of severe disease only perceives the pain as acute. But unrelieved pain can cause depression, anxiety, agitation, aggression, confusion, decreased socialization, sleep disorders, difficulty in moving and walking with increase in health care utilization costs. All these factors affect the reduction in quality of life as well as the increasing of disability and mortality.

It is understandable, then, how important it is to treat pain in patients with severe dementia, if only to reduce its state of unrest which, if misinterpreted, is treated with tranquilizers in this case, most likely, not would remove the state of pain but would end up further deteriorate the patient's cognitive status. As regards, then, the choice of drugs for use in patients with dementia, taking into account that the increased frequency of illnesses due to pain in this subject are represented by bone and joint diseases, neurodegenerative and vascular diseases, which almost always are associated with a depression, the best treatment is the use of antidepressants and antiepileptic drugs (39), widely used for the control of chronic pain, perhaps associated, if possible, to opiates, in their various forms, specific for the treatment of acute pain, or even better using the new class of medicines called MOR / NRI, agonists opioidergic receptors (MOR) and selective norepinephrine reuptake inhibitors (NRI). This new class of analgesic drugs is represented, first and foremost, from Tapentadol, which is a central analgesic that combines in one molecule the two mechanisms of action (40): the competitive spirit on the  $\mu$ -opioid receptor (MOR) and the inhibition of norepinephrine reuptake (NRI) and can be a good reference for analgesia of acute and chronic pain in view of the low potential for drug interactions (simple molecule that does not produce active metabolites, and with a low potential for interactions) and reduced side effects for greater safety in the elderly patient multitreated (41) and takes the drugs commonly used for dementia such as acetyl cholinesterase inhibitors and memantine.

## Conclusion

Healthcare professionals should always be included in the process of care and assistance to people with cognitive impairment pain assessment, a prerequisite to treatment. Because they do not always communicate that feeling and the pain is not treated due to, among other things, states of agitation and unusual behaviors that make the patient not easy to handle and induce to institutionalize families reducing the quality of life and increasing disability and mortality.

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