

# Nourishing behavior in institutionalized elder adults with cognitive disorder

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## SUMMARY

**Introduction:** Cognitive disorder (CD) is the most frequent alteration in the aged and increases with time, usually causes nourishing changes that turn them into a group of nutritional risk. It is important to periodically assess the state of nutrition and the nourishing behavior; that is why scales exist, like the Blandford scale, which by means of very simple items makes it possible to identify 5 stages: aversion to self-feeding, dyspraxia/agnosia, oropharyngeal and pharyngoesophageal selective behavior, dysphagias. **Objective:** To evaluate the nourishing conduct in institutionalized adults with CD. **Material and method:** Descriptive, cross-sectional study. Including 5 geriatric homes from Mar del Plata, Miramar and Santa Teresita. Data: Blandford test, Sex, Age, CD class, food consistency, degree of dependency. Excluded: residents without CD. Statistical: chi<sup>2</sup>, t Student, proportions comparison. Significance  $p < 0.05$ . Confidence interval: 95%. **Results:** The total population was of 191 residents, 119 women (W) (62.3%) and 72 men (M) (37.7%), there were 41 adults, 27 W (65.8%) and 14 M (34.2%) with CD. The average age was of  $82.4 \pm 5.4$  years old, without differences neither between W and M nor between towns. The prevalence of CD in W was 22.7% and in M was 19.4%, without statistical significance. The sample was divided in  $<80$  and  $\geq 80$  years old and a different distribution pattern of CD according to age was observed, the disease of Alzheimer was preponderant in  $\geq 80$  years old ( $p < 0.01$ ) and the minimum cognitive damage in  $<80$  years old. The Blandford evaluation indicated: 51% (n=21) in stage 2, 39% (n=16) in stage 3, 7.3% (n=3) in stage 4 and 2.4% (n=1) in stage 5. The type of feeding that they were receiving was: semisolid-processed 73.2% (n=30) and normal 26.8% (n=11). From the analysis of the degree of dependency in feeding themselves, it was observed that: they need aid 70.7% (n=29), totally dependent 19.5% (n=8) and independent 9.8% (n=4). **Conclusions:** In this work most of the adults attend stage 2 of Blandford, with lack of attention, feed only with verbal inducement, show difficulty in using cutlery, consistency of the food is semisolid with a high degree of dependency on the caretakers at the time of the meal. The Blandford scale is good for diagnosis, with easy application that allows for the evaluation of the degree of nourishing alteration in adults with CD and it is useful at the time of adapting the nourishing plan. It is also useful when orienting and educating caretakers on the correct techniques that must be carried out when feeding these adults.

**Key words:** Aged; cognitive disorder; nutrition; Blandford scale; geriatric homes.

## INTRODUCTION

### Cognitive Disorder

"Cognitive disorder is the loss or alteration of the higher mental functions, such as memory, orientation, language, vi-

sual recognition, calculation and behavior, which interfere with the social activity and interaction of the affected person.<sup>1</sup>

Although memory changes associated to age are common to a normal aging process, when severe deterioration occurs, a certain percentage of these patients can develop a dementia

process. *This mild cognitive disorder*<sup>2</sup> is coupled with disorientation, difficulties when speaking and acquiring new information. Although in general essential cognitive functions tend to be preserved, the aged presents subjective complaints about his/her memory, problems with logical reasoning and difficulty to perform complex tasks.

On the other hand, dementia is presented with progressive loss of brain function; it is not considered as a condition in itself, but as a group of ailments which involve memory, behavior, learning and communication problems. In general, most cases of dementia occur in people over 60 years old, and their risk increases as the aging process goes on. Cognitive disorder and dementia are similar concepts, the only difference between them is the degree of alteration and their main risk factor is the subject's age.<sup>3</sup>

According to Osvaldo Fustinioni (2004), the most frequent dementia cases are Alzheimer's Disease and its variants (50%), Cerebrovascular Disease (20%) and Parkinson's Disease (10%). These generally occur with diverse symptoms, such as: short and long-term memory loss, temporal and spatial disorientation, changes in the working and social behavior, aphasia (problems with language comprehension and expression), agnosia (failure to recognize or identify objects), apraxia (incapacity to perform motor functions) and problems with the capacity for abstraction.

The DSM - IV<sup>4</sup> states that dementia cases are classified according to the brain's affected area and its associations with other pathologies. When the damage is mainly at the cerebral cortex, there is a cortical dementia case, which can cause memory, language, thinking or social behavior alterations. On the other hand, when the damage is underneath the cerebral cortex, there is a subcortical dementia case, which affects movement, memory and the emotional area.

### Senile Dementia

Senile dementia presents a loss of the brain function due to small cerebrovascular accidents that take place as the aging process develops.

It is defined by the DSM-III as an organic mental syndrome characterized by a deterioration of short and long-term memory, associated with problems with abstract thinking, judgment, higher cortical functions and personality changes. The onset age is usually after 65 years old, and it can be mild or serious according to the dependency degree on daily life activities (DLA). Short-term (failure to remember the name of objects after five minutes) and long-term (failure to remember information which was known to the subject in the past) memory loss are observed. It must also include at least one of the following alterations: abstract thinking deterioration (difficulty to define concepts, similarities, meaning of terms, etc.), judgment deterioration (failure to solve problems related to the daily, working, and social life, failure to make plans, etc.), aphasia, apraxia, agnosia, constructive difficulties and personality changes.

Symptoms which usually occur with this ailment are: learning disorders, disorientation, seizures, muscular contractures, reflex disorders, tremor, motor incoordination, difficulty in walking, self-feeding, washing oneself, dressing oneself, performing house chores and leading a daily life in general, with manic-depressive episodes, violence, apathy, drifting, sleeping disorders, obscene language, hallucinations, delirious ideation, thefts, paranoia, judgment disorders, paradoxical behaviors, sexual disorders, social maladjustment, and visual, taste, hearing and smelling alterations.

According to Pablo Bagnati,<sup>5</sup> dementia cases can be broken down into four groups: in a transitional stage between normal cognitive abilities and an evident Alzheimer's disease there is a *Minimum Cognitive Damage* (MCD), with memory difficulties acknowledged by the aged themselves or by others, which can be detected via memory sensitive tests. *Vascular Dementia* (VD), on the other hand, has a faster development than Alzheimer's disease and can coexist with it; it is a very common mixed dementia. *Frontal Lobe Dementia or Pick's Disease* (PiD) is rare, and responsible for only 5% of dementia cases; it is observed in patients with frontotemporal dementia, where feeding behavior is altered and there is a loss of social awareness. Lastly, the *Lewy Bodies' Dementia* (LBD) has aspects of Alzheimer's disease associated to elements of Parkinson's disease, with visual hallucinations.

### Alzheimer's disease

Alzheimer's disease, or primary dementia, is a degenerative and progressive disorder which affects brain tissues and produces a helplessness state.<sup>6</sup> It presents neuronal tissue loss and also loss of the neurofibrillary structure present in the hypothalamus and in the cerebral cortex, areas responsible for the memory and the intellectual capacity.

It is one of the most common forms of dementia, affecting most of the population over 60 years old.<sup>7</sup>

Alzheimer's disease develops within four stages, from mild to severe, and patients begin to need help in complex activities such as calculations, in daily life activities; food preparation must be monitored (for example, safety measures in the kitchen must be taken); they do not recognize family or friends, or mix people up.<sup>16</sup> Swallowing disorders can also arise and depression, anxiety and delirium can coexist.

### Parkinson's disease

Parkinson's disease (PaD) is a progressive neurodegenerative condition that, according to estimates, affects 1% of the population over 50 years old and of which the average onset age is between 60 and 65 years old.

PaD has dopamine alterations by affected substantia nigra neurons as the physiopathologic substrate. These neurons are responsible for the modulation - through different paths - of the thalamus and its connection to the cerebral cortex. In order to clinically see PaD, it is necessary to have a loss of dopaminergic neurons greater than 80%.<sup>8</sup>

As PaD evolves, 40%-70% of patients will develop dementia. Parkinson's dementia starts before two years since diagnosis. If it occurs before or during the two years since the PaD diagnosis, it fits the Lewy bodies' dementia criteria. These two forms of dementia have similar neuropathological, clinical and developmental patterns, but differ from Alzheimer's disease in its association to visual disorders, greater alterations of the attention sphere and lesser memory affection.<sup>9</sup>

### **Nourishing Aspects**

Nourishing and nutrition are basic aspects which must be preserved and, in order to do so, it is necessary to make changes to the nourishing plan depending on the condition's developmental stage. That is why it is important to regularly assess the elderly adult's stage of nutrition, in order to avoid malnutrition.

Another aspect to be controlled and which should not be disregarded in patients presenting cognitive disorder is nourishing behavior, for the patient with dementia can reject and even feel aversion for food, regardless of its organoleptic and presentation features, as well as in early apraxias, in which there are problems with cutlery handling, and in agnosias, in which patients fail to recognize and differentiate food from other non-food substances or things.

It is also common for adults in advanced stages of the disease to lose weight,<sup>10,11,12</sup> generally regardless of the diet's caloric content, due to hypothalamic subcortical lesions which can affect the appetite regulating centers and the metabolic processes which regulate weight and body composition.<sup>13</sup> Some patients may not want to open their mouths, while others may become compulsive eaters or may try to swallow inedible objects.

With regards to drugs used for treating dementia, it is important to know that some can directly or indirectly affect the nourishing state, like cholinesterase inhibitors used for treating Alzheimer's disease. These drugs inhibit the enzyme which destroys acetylcholine (one of the main brain neurotransmitters), thus favoring nervous transmission. For example: donepezil can cause vomitus, diarrhea, nausea, anorexia, weight loss and depression. Rivastigmine, also used to treat Lewy bodies' dementia, can cause nausea, vomitus, anorexia and weight loss. Galantamine can cause nausea, vomitus, anorexia, diarrhea, dyspepsia, drowsiness and weight loss.

It must be noted that levodopa, used for treating Parkinson's disease, is absorbed in the intestine, so it must always be taken 30 to 45 minutes prior to meals; it is also important to keep in mind that it is incompatible with food proteins, for they both use the same intestine-level absorption means.<sup>14</sup> Levodopa's plasmatic life is 60-90 minutes. Once that time has elapsed, most of the levodopa which has not managed to cross the blood-brain barrier (BBB) is destroyed and eliminated. Moreover, it must be noted that fat foods delay gastric emptying, thus the levodopa will stay longer in the

stomach and will be destroyed. The second important point to be considered is having a low-protein diet<sup>15</sup> during the times of the day that you wish to have good mobility, i.e. during the day; and increasing the protein intake during the night, at the expense of enduring less nightly mobility, as long as it does not interfere with the quality of sleep.

Patients who drift and are in constant movement require an additional caloric increase in comparison to sedentary patients. The food consistency also has to be changed depending on the chewing and swallowing ability of each patient and, when patients are unable to chew and swallow, the option is to feed them enterally through nasogastric tube or gastrostomy.

The nourishing behavior and the way in which the aged relate to the food must be periodically assessed to avoid deviations. In the daily practice, the Blandford scale<sup>10,12</sup> can be used, which makes it possible to assess the behavior through a series of very simple items which only require the surveyor's observation and do not require the patient's participation. Although it lacks a rating, this scale makes it possible to identify 5 developmental stages: aversion to self-feeding, general dyspraxia or agnosia, selective behavior, oropharyngeal and pharyngoesophageal dysphagia. Although it is not a predictive scale, it is useful to perform diagnosis.

This work aims at valuing the anomalous behavior during the food intake of patients with cognitive disorder, using the Blandford scale as a diagnostic tool of the developmental stage. This knowledge will make it possible to adapt the institutional nourishing assistance to these patients' functional capacity, as well as to instruct the staff and family on the alarm signs and changes to be implemented in each stage of the condition.

### **GENERAL OBJECTIVE**

To assess the nourishing behavior of institutionalized patients with cognitive disorder by means of the Blandford scale.

### **SPECIFIC OBJECTIVES**

- To determine the usefulness of the scale applied for this study in the dietary prescription of the elderly adult.
- To determine the relation between the nourishing behavior and the kind of food provided.
- To establish the distribution of the CD in the reference population of this study, setting the cut-off point at 80 years old.
- To delimit the percentage distribution of the characteristics related to CD and the dietary consistency according to the Blandford stage.

### **MATERIAL AND METHODS**

Descriptive, cross-sectional study. The nourishing behaviors of elderly adults with different degrees of cognitive

disorder (CD) from 5 geriatric homes from Mar del Plata, Miramar and Santa Teresita during the months of June and July, 2007, were analyzed. The tool used for the assessment was Blandford's *Aversive Feeding Behaviors Inventory* scale, which was completed by professional nutritionists by watching the resident at the time of the main meal. The assessment made it possible to divide the residents in 5 developmental stages.

The forms of dementia were classified using P. Bagnati's reference in: Minimum cognitive damage (MCD), Vascular dementia (VD), Frontal lobe dementia or Pick's disease (PiD), Lewy bodies' dementia (LBD), Alzheimer's disease (AD) - because it is considered to be the most current one, according to the experts involved.

The diagnosis of the form of dementia was taken from the patient's medical history, and in each case it was performed by psychiatrists, neurologists or general practitioners.

Other data collected were: sex, age, food consistency, and degree of dependency; they were classified in the following way:

*Food consistency:*

- Normal, solid or semisolid food which can be eaten with fork, knife and spoon.
- Processed, only semisolid food which can be eaten with a spoon.

*Degree of dependency for feeding:*

- Independent, the patient was capable of self-feeding in a reasonable time frame.
- Needs help, the patient needed help to cut meat or bread, spread, etc., but was able to self-feed.
- Dependent, the patient needed to be fed.

All residents without cognitive disorder were excluded.

The data collected were stored in a spreadsheet and then processed with Epidat 3.0. The significance level was  $p < 0.05$  with a confidence interval of 95%. The statistical used were  $\chi^2$ , t Student for independent samples and proportions comparisons.

**RESULTS**

The total resident population of the 5 geriatric homes which were part of the study was of 191 elderly adults, 119 women (62.3%) and 72 men (37.7%). The mean age was  $82.4 \pm 5.4$  years old, without significant statistical differences among men and women or between towns.

There was a cognitive disorder in 41 residents (21.5%), 27 women (65.8%) and 14 men (34.2%). Using Bagnati's classification, participants were divided into 5 groups, according to the cognitive damage each of them had. Thus, there were 8 residents (19.5%) with MCD, 14 adults (34.1%) with VD and 19 residents (46.3%) with AD. There were no PiD or LBD patients. When comparing the proportions of residents with cognitive disorder in the 3 towns (p value: NS), there were no significant differences, nor there was a statistical

significance when the proportions of AD residents from Mar del Plata, Santa Teresita and Miramar were compared, which means that the amount of elderly people with this condition was proportional in the three groups.

In order to determine whether the CD prevalence in the female sex was greater than in the male sex, a sample grouped by sex and by the presence or absence of CD was analyzed (Table 1). Results show that the prevalence in women was of 22.7%, while in men it was of 19.4%. These differences bear no statistical significance.

Considering the age of 80 as a cut-off point for fragile old age and its relation to CD, the sample was divided into 2 groups: younger than 80 years old and adults with 80 years old or older. Results are shown in Table 2, together with the Chi2 statistical significance, by means of which it is possible to infer that there is a different cognitive damage distribution pattern according to the age group. In fact, AD was more frequent in 80-year-old adults or older ( $p < 0.01$ ), while the younger subjects showed a greater proportion of minimum cognitive damage.

In relation to the data obtained by applying the Blandford scale for classifying the developmental stage of the nourishing alteration, it was possible to observe that 58.5% (n=24) of CD residents were in Stage 2 with general dyspraxia and/or agnosia secondary to confusion and lack of attention due to the global cognitive deficit. 31.7% (n=13) were in Stage 3 with selective behavior; it is possible in this stage to feed the patient if qualitative changes on the diet are made. 7.3% (n=3) were in Stage 4, with oropharyngeal dysphagia and presented oral muscular incoordination in the oral and

Table 1. Residents grouped by sex and presence or absence of cognitive disorder

	With cognitive disorder		Without cognitive disorder		$\chi^2$	p
	n	%	n	%		
Women	27	65.8	92	61.3	0.28	NS
Men	14	34.2	58	38.7		
Total	41		150			

Table 2. Distribution of Cognitive Damage per age ranges - both sexes included

Type of cognitive disorder	<80 years old		≥80 years old		Total
	Number	%	Number	%	
(MCD)	6	40	2	7.7	8
(VD)	7	46.7	7	26.9	14
(AD)	2	13.3	17 (*)	65.4	19
Total	15		26		41

(\*)  $p < 0.01$

MCD: Minimum Cognitive Damage

VD: Vascular Dementia

AD: Alzheimer's Disease

pharyngeal stages of swallowing; thus, the patient's dependency was virtually total towards the caretaker when it came to eating. Lastly, 2.4% (n=1) were in Stage 5, with pharyngoesophageal dysphagia, choking and aspiration risk; this is the final manifestation of eating disorders and, at this point, intervention techniques are invalid and different alternatives – like enteral nutrition – arise.

When assessing food consistency and its relation to Blandford's stage, it was observed that only 45.8% (n=11) of those who were on stage 2 were on a normal diet; the rest of the patients were on a processed diet. In the total CD population, the kind of food that the patients were receiving when samples were taken was of a semisolid and processed consistency for 73.2% (n=30) and was a general diet with normal consistency for the remaining 26.8% (n=11). Graph 1 shows the relation between food consistency and the developmental stage in the Blandford scale; Table 3 shows the percentage distribution of characteristics related to the Cognitive Damage and the diet's consistency according to the stage of the Blandford scale.

With regards to the dependency degree observed, it was recorded that 70.7% (n=29) needed help to eat, 19.5% (n=8) was totally dependent on a caretaker for eating assistance, and only 9.8% (n=4) could eat without help and in a reasonable timeframe. When comparing the proportions of residents who needed help to eat, there were no statistical differences or significance among the Mar del Plata and Santa Teresita's populations. However, when comparing these proportions to Miramar's population, there was a significant difference of proportions (p<0.03). These data indicate that the proportion of residents who needed help to eat is different at Miramar's geriatric home.

The distribution per dependency level and food consistency was arranged as shown in Table 4; in Graph 2 it is possible to distinguish how the need for processed diets increases as the disorder progresses.

**DISCUSSION AND CONCLUSIONS**

The elderly adult population with cognitive disorder is constantly growing as life expectancy grows. It is thus important to keep in mind what happens with the nourishing of this population group, for it is a nourishing risk group. Cognitive damage, according to our results, does not seem to belong to one sex or the other in particular. However, it does not happen the same with age, for the passing of time increases the deterioration and fragility of the aged. In our job, the MCD seems to be related to adults younger than 80 years old, while AD is present in an important amount of adults over 80 years old.

With regards to the method used to assess the nourishing behavior, we have observed that most participants were on stage 2 of the scale; this means that inattention, general dyspraxia and agnosia are significant, the patient only eats

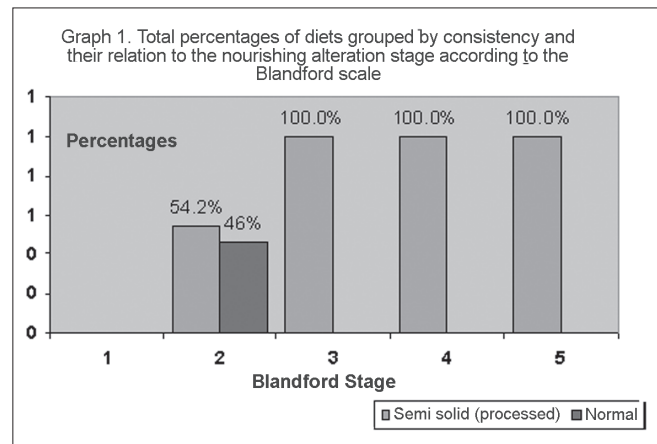


Table 3. Percentage distribution of characteristics related to the Cognitive Damage and the diet's consistency according to the stage of Blandford scale

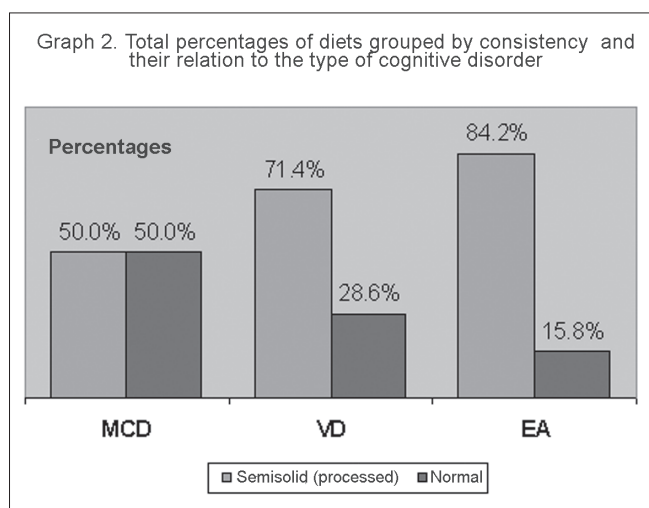
	Stage of Blandford scale									
	1		2		3		4		5	
Type of Cognitive	n	%	n	%	n	%	n	%	n	%
MCD	-	-	7	29.2	1	7.7	-	-	-	-
VD	-	-	9	37.5	5	38.5	1	33.3	-	-
AD	-	-	8	33.3	7	53.8	2	66.6	1	100
<b>Diet's Consistency</b>										
Semisolid (processed)	-	-	13	54.2	13	100	3	100	1	100
Normal	-	-	11	45.8	-	-	-	-	-	-

MCD: Minimum Cognitive Damage  
 VD: Vascular Dementia  
 AD: Alzheimer's Disease

Table 4. Percentage distribution of characteristics related to the Cognitive Damage and the diet's consistency according to the degree of nourishing dependency

	Degree of dependency					
	IND		NH		DEP	
Type of Cognitive	n	%	n	%	n	%
MCD	4	100	4	13.8	-	-
VD	-	-	12	41.4	2	25.0
AD	-	-	13	44.8	6	75.0
<b>Diet's Consistency</b>						
Semisolid (processed)	-	-	23	79.3	7	87.6
Normal	4	100	6	20.7	1	12.5

MCD: Minimum Cognitive Damage  
 VD: Vascular Dementia  
 AD: Alzheimer's Disease  
 ND: Independent  
 NH: Needs help  
 DEP: Dependent



thanks to verbal inducement, is unable to use cutlery properly, plays with food but does not eat it, can ingest inedible objects like diapers, napkins, etc. In some cases, the patient ignores or does not recognize food, which does not mean that he/she is not hungry, but that he/she cannot coordinate the feeding act. Due to this symptomatology, many patients are unsatisfied or hungry, for these signs typical of cognitive damage can go unnoticed to caretakers, who stop feeding the patients because they think they are satisfied. From then on, the malnutrition cascade starts.

Another important aspect we have observed is related to food consistency. Most of the people assessed had processed food; although in all the geriatric homes included there is a professional nutritionist who supervises nourishing, one would have to wonder what does happen with the nourishing content of these diets in the geriatric homes in which the cooking staff decides what kind of food to process.

Another high percentage was recorded in the degree of dependency for eating: 70.7% of the aged need some kind of help for cutting, spearing, taking utensils to the mouth, serve themselves, etc. And a 19.5% is totally dependent on a caretaker to feed themselves. It is then again necessary to highlight the importance of people who assist the aged in their nourishing, by attending to their needs and actively collaborating during the eating act.

Lastly, we see that as cognitive damage deepens, the difficulties in the nourishing processes become more evident, and food needs to be changed consistency; this indicates that, inevitably, elderly people suffering from CD will require processed food and will depend on the caretaker's help at the time of eating.

## FINAL CONCLUSION

According to our study, the results obtained show that the Blandford scale is an easy-to-apply diagnostic tool which

makes it possible to assess the nourishing alteration degree in adults with cognitive disorder, and it is useful for adapting the nourishing plan. It is also useful for orienting and educating caretakers and families on the correct techniques that should be applied at the time of feeding the aged, adapting the needs to the developmental stage, in order to improve the quality of life.

### Blandford's Aversive Feeding Behaviors Inventory Scale

#### *Resistant behavior (defensive reflexes)*

1. Turns his/her head when faced with a spoon.
2. Covers his/her mouth with his/her hands to avoid eating.
3. Pushes food away or the person who is trying to feed him/her.
4. Scratches, hits or bites the person who is feeding him/her.
5. Throws food away.

#### *General dyspraxia/Agnosia (global cognitive deficit, confusion, inattention)*

6. Eats only thanks to verbal inducement.
7. Uses his/her fingers instead of cutlery.
  - 7.a Is unable to use cutlery.
8. Mixes and plays with the food, but does not eat it.
9. Talks or vocalizes constantly instead of eating.
10. Ingests inedible objects (diapers, napkins, etc.).
11. Constant drifting at meal time.
  - 11.a Ignores or cannot recognize food.

#### *Selective behavior (requires qualitative changes on the diet)*

12. If he/she is not given certain food or additives, he/she does not eat.
13. After getting the food he/she asks for, he/she tries it but then rejects it.
14. Does not eat variedly enough.
15. Eats small amounts and then stops eating.
16. Prefers liquid food (over 50% of intake).
17. Only accepts liquids.

#### *Oropharyngeal dysphagia (oral neuromuscular incoordination at intake)*

18. Does not open his/her mouth unless physically forced.
19. Pushes his/her lips together thus impeding food intake.
20. Closes his/her mouth and teeth thus impeding food intake.
21. Constantly moves his/her mouth or tongue.
22. Accepts food and then spits it.
23. Accepts food but does not swallow it.
24. Accepts food but it falls because his/her mouth is kept open.

*Pharyngoesophageal dysphagia (food in the air way)*

25. Coughs or chokes with food.

26. Loses voice or has a dry voice.

The scale's assessment makes it possible to identify 5 developmental stages:

Stage 1: Aversion to self-feeding, the patient has a resistant behavior towards eating, with defensive reflexes and a systematic rejection of food.

Stage 2: General dyspraxia and/or agnosia secondary to confusion and lack of attention due to the global cognitive deficit.

Stage 3: Selective behavior, it is still possible to feed the patient if qualitative changes on the diet are made.

Stage 4: Oropharyngeal dysphagia; there is oral muscular incoordination in the oral and pharyngeal stages of swallowing. There is a virtually total dependency of the patient towards the caretaker when it comes to eating.

Stage 5: Pharyngoesophageal dysphagia, choking and aspiration risk; it is the final manifestation of eating disorders. At this point, intervention techniques are invalid and different alternatives to oral nourishing – like artificial nutrition – arise.

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