

## R E V I E W

## Nutrition in patients with unilateral neglect

*Emanuele Di Simone<sup>1</sup>, Noemi Giannetta<sup>2</sup>, Andrea Gazzelloni<sup>3</sup>, Roberto Torre<sup>4</sup>, Jacopo Livadiotti<sup>3</sup>, Sara Dionisi<sup>1</sup>, Flavio Di Muzio<sup>5</sup>, Marzietta Montesano<sup>6</sup>, Alessandra Moriconi<sup>7</sup>, Fabio Fabbian<sup>8</sup>, Marco Di Muzio<sup>9</sup>*

<sup>1</sup>Department of Biomedicine and Prevention, Tor Vergata University of Rome, Italy. E-mail: emanuele.disimone@uniroma1.it; <sup>2</sup>Department of Biomedicine and Prevention, Tor Vergata University of Rome; Vita-Salute San Raffaele University, Milan. <sup>3</sup>Sapienza University of Rome, Italy, The Bambino Gesù Children's Hospital Rome, Italy; <sup>4</sup>Pulmonary Hypertension Unit, Department of Cardiovascular and Respiratory Sciences, Sapienza University of Rome, Italy; <sup>5</sup>Azienda Sanitaria Locale Rome 4, Rome, Italy; <sup>6</sup>St. Andrea Hospital, Sapienza University of Rome, Italy; <sup>7</sup>Policlinico Umberto I of Rome, Sapienza University of Rome, Italy; <sup>8</sup>Department of Medical Sciences, University of Ferrara, Ferrara, Italy; <sup>9</sup>Department of Clinical and Molecular Medicine, Sapienza University of Rome, Italy

**Summary.** *Objective:* to evaluate the impact of neglect on patient nutrition and nursing skills to reduce malnutrition. To determine attitude of health care professionals towards nutritional needs in patients with neglect. *Methods:* The purpose of this narrative literature review was to explore empiric literature that surrounds the measures to be carried into the environment of the meal, diet and encourages patient independence with neglect. This literature review to include articles from all countries and national languages (English, Spanish and Italian) that pertain to this topic. Methods OVID Medline, CINAHL, Cochrane, Scopus, Google Scholar and Web of Science were used to identify articles. Twenty-five articles were included according to inclusion and exclusion criteria. *Results:* The review shows that damage to the right cerebral hemisphere leads to a higher frequency of dysphagia than lesions in the left cerebral hemisphere. The lack of awareness of the stimuli coming from one side of the space, caused in fact by the neglect, make the feeding of the patient difficult and lead to inhalation and aspiration pneumonia. *Conclusions:* Dysphagia contributes to more difficult rehabilitation: patients with neglect have a high risk of developing malnutrition, reduced immune defenses, infections and aspiration pneumonia.

**Keywords:** unilateral neglect, nutrition, eating disorders, nurses, meal environment, dysphagia

### Introduction

The term Unilateral Neglect refers to the failure to report, respond, or be aware of contralateral stimuli that is not caused by an elemental sensorimotor deficit (1).

Hemispatial neglect is a common disability due to unilateral brain damage, more commonly due to right hemisphere damage. Different pathological conditions such as cerebral infarction and hemorrhages, tumors compression and degenerative diseases can induce this kind of neurological disorder. Nevertheless, brain ischemia or hemorrhagic ischemia, especially of the right hemisphere, seem to be the more common cause of neglect for at least two-thirds of the patients. This

disabling neurobehavioral disorder seems to be mainly associated with damage of the superior temporal lobe and subcortical structures.

Patients with neglect are typically unable to recognize objects, people or representations in the contralateral space of the brain lesion. However, patients with neglect, even after the loss of awareness of left side space, seem to maintain an unconscious level of alert that affects their behaviour. In fact, if a picture of a house with the left side on fire is shown to a neglect patient, he could not notice anything strange, but he would deny going to live in that house if asked (2).

Moreover, neglect can be associated with anosognosia or impaired self-awareness and patients could

deny their disabilities and deficits. Patients with this symptom believe that their representation and perception of the environment is normal. This condition can expose patients to an increase in the risks in daily life (i.e. crossing roads).

The incidence of neglect due to right hemisphere damage ranges from 13 to 82% of post-stroke patients (3). Post-stroke patients affected by neglect show a severe inability in self-care, in mobility and transfers. Neglect is usually associated with higher disability and poor response to rehabilitation. For this reason, probabilities to return to an independent life are significantly lower as well as the risk of falls or serious injuries is higher. Moreover, patients with spatial unilateral neglect result to be poorly cooperative and caregivers may experience a higher level of stress. Neglect is a condition that leads to a high level of dissatisfaction and frustration in terms of a patient's life expectancy, mostly immediately after the brain damage or within the first year. Hospitalization is common within the first twelve weeks after stroke event but, unfortunately, discharge is not possible for all patients. Chronicity occurs in one-third of neglect patients (3).

There are many factors that can negatively affect neglect patients' wellbeing and nurses have the responsibility to know and to identify them. In particular, neglect affects feeding needs and patients can experience severe problems due to dysphagia, malnutrition and risk of aspiration.

The aim of this review is to raise awareness about the principal key topics related to this neurological disorder in health care professionals and, eventually, in caregivers in order to perform important patients care activities.

## Methods

A narrative review of the literature. Scientific articles have been searched in PubMed, CINAHL, Cochrane, Scopus and Google Scholar databases. The same research method was applied for all the databases and the English keywords used to select articles were: neglect, hemineglect, food, stroke, acute stroke, malnutrition, nutritional status indicators, dysphagia, stroke rehabilitation, unilateral hemispheric stroke,

lingual exercise, hemispheric stroke, left and right stroke, meal. Clinical studies, randomized controlled studies and systematic reviews in English, Italian and Spanish language were included.

The bibliographic research was conducted between May and September 2017, and 25 papers published in the last ten years were selected and analyzed. The selected studies concern: dysphagia and right hemisphere lesions, methods to assess dysphagia, risk of aspiration and Hospital Acquired Pneumonia (HAP), alternative nutrition methods and regimens.

## Results

### *Dysphagia and right hemisphere lesions*

Dysphagia and neglect represent "two sides of the same coin". Nevertheless, dysphagia is often underestimated, but this disorder affects at least 50% of stroke patients. Dysphagia shows the tendency to regress in half of the cases in the early stages of the acute event, while in the other 50% of cases patients live with the disorder for months (4). In a cohort study, conducted May's et al., unilaterality seems to significantly influence pharyngeal deglutition mechanisms, mostly when lesions involved right hemisphere (5). This is also reported in an experimental study conducted by Khedr et al. in 2008, where dysphagia was present in five cases out of six, always in right hemisphere lesions (6). Another experimental study, conducted by Falsetti et al. in 2009, found a higher incidence of dysphagia in stroke patients with right cortical lesions and a lower incidence in stroke patients with subcortical lesions (7). Yin et al. in 2009, found that, in stroke patients, swallowing function is associated with compensatory recruitment and activation of regions of the brain cortex in the intact hemisphere (8). This study, therefore, suggests that future rehabilitation treatments, targeted at swallowing function improvement, should aim to facilitate the intact hemisphere to promote compensation. In 2015, Suntrup et al., in an experimental study (9), found that dysphagia was mainly determined by lesions of the right hemisphere in the pre and post central gyrus, the operculum region, and the underlying subcortical white matter. Therefore, post central lesions seem to cause episodes of major swallowing dysfunction.

A descriptive and transverse study conducted by Medin et al. in 2011, reported that women had more severe stroke events, lower energy levels and a general decrease in well-being (a decreased Quality of Life – QoL). In addition, the major difficulties reported by patients during post-stroke phase has been related to feeding issues such as handling the food in the plate, food consumption and sitting position (10). While sitting position, handling the food in the plate and mouth chewing of food seems to improve significantly from the early acute phases up to three months (10), dysphagia seems to get worse in patients in the first three months after the stroke event (11).

#### *Methods to assess dysphagia*

Clinical and instrumental assessment methods are administered to identify dysphagia. Guillen-Solà et al. in 2013 introduced a tool, the Volume-Viscosity Swallow Test (V-VST), a non-invasive method to recognize and assess the severity of patient's dysphagia (12). In particular, this method consists of giving food with different volumes and viscosity (liquid, nectar and pudding viscosity), under pulse oximeter control, to a bedridden patient. The V-VST has 100% sensibility for aspiration, but low specificity (28.8). Another method, the Videofluoroscopy (VFS), evaluated through the Penetration Aspiration Scale (PAS), utilize two different scores, the first one with a range between two and five to indicate food penetration in the larynx, and the second one with a range between six and eight to indicate food aspiration through vocal cords.

In 2007, in a prospective cohort study, Robbins et al. used the Iowa Oral Performance Instrument (IOPI) (13). This device measures lip and tongue strength during isometric exercises by compressing an air-filled bulb. In this study, all subjects significantly increased isometric and swallowing pressures, with fewer episodes of aspiration, particularly related to liquids intake. Stroke patients with dysphagia demonstrated an increase in lingual strength with associated improvements in swallowing pressures, after an 8-week training program with progressively increasing tongue resistance. QoL improvements were also registered, as well as dietary intake. This treatment not only improves dysphagia but also increases patient's compliance.

#### *Risk of aspiration and Hospital Acquired Pneumonia (HAP)*

With concern to Hospital Acquired Pneumonia (HAP), a Kemmling et al.'s retrospective study, conducted in 2013, reported that this condition is associated with right hemisphere stroke when lesions involve the peri-insular area (14). According to a recent hypothesis, since the stroke could induce immunity suppression, this condition should be due to an automatic modulation of immune mechanisms. An experimental study conducted by Power et al. in 2009, explained that aspiration cannot always be easily predicted by lesion locations, because it depends on patients ability to swallow and aspiration episodes cannot be predicted (15).

During the first 10 days of hospitalization patients, conditions tend to deteriorate significantly and the risk of malnutrition is higher (16). In fact, the 93.2% stroke patients over 65 of age had a malnutrition risk, and consequently, they have a higher exposure to pneumonia episodes (17). Two risk factors significantly associated with malnutrition seem to be nicotine addiction and dysphagia (18).

An experimental study, conducted by Cohen et al. in 2015 and focused on management and reduction of post-stroke pneumonia, has shown how selective oral decontamination reduces Gram-negative bacteria colonization of the oropharynx and this is associated with a relevant reduction of pneumonia (19). Moreover, the regular administration of an antiemetic agent, such as metoclopramide, through a nasogastric feeding tube, has brought a reduction of 69% of pneumonia.

A Cochrane review has demonstrated that antibiotic prophylaxis can reduce significantly post-stroke infections. For this reason, preventive treatments should be administered immediately and for the following two weeks, this is the lapse of time when patients are more exposed to aspiration risks. This review has shown how nurses often induce aspiration during oral care hygiene; for this reason, even if advised, the use of toothbrushes with toothpaste and chlorhexidine solutions for oral hygiene should be carefully considered and reduced.

#### *Alternative nutrition methods and regimens*

A retrospective study, conducted in 2014, has shown different nutrition methods and regimens in ischemic stroke patients and in hemorrhagic stroke

patients. According to this study, in the first type of stroke the most common nutritional regimen was a general diet, in the second type, since the use of nasogastric feeding tube was commonly used, a different nutritional regimen was applied (20). Nasogastric tube-feeding patients group showed signs of malnutrition after 7 days as well as patients with dysphagia diet showed similar nutritional deficiencies. Serum proteins indicators can assess nutritional status. Prealbumin is the preferred indicator since its half-life is short (only two days), it quickly responds to changing nutritional status. At seven days after admission, the tube-feeding group had pre-albumin values below the normal range. This suggests the need to adjust the caloric intake and food composition of both tube feeding patients and patients with dysphagia.

Specific lesions location predicts early tube feeding dependency. Galovic et al., in a cohort study in 2016, stated that specific lesions of the anterior insula lead to severe impairment and tube dependency, while damage to the opercula-insular area correlates with mild impairment of oral intake (21). In 2017, the same author highlighted how tube feeding should be indicated when feeding rehabilitation is assumed to be longer than seven days, while Percutaneous Endoscopic Gastrostomy (PEG) feeding if longer than 4 weeks (22). A retrospective study, conducted by Kumar et al. in 2012, demonstrated that the presence of bihemispheric infarcts predicts PEG placement and that lesions that are more isolated would not predict PEG placement as a necessary measure, with the exception of peri-ventricular strokes (23).

## Conclusions

Identifying patient health needs and planning specific interventions to reach nursing goals are the core conditions of the nurse's action (24, 25).

Nurses have a central role in medication process: they spend as much as 40 percent of their time in medication administration (26,27). In addition, nurses have a central role in caring neglect patients with dysphagia, both in hospital and in homecare settings, in order to prevent risks related to this neurological disability. Therefore, nurse has to carry out assessments

and interventions to support the achievement of all the patients daily life activities that are no more immediate or spontaneous, through his competencies and specific knowledge (28).

Dysphagia is a common problem in stroke patients and, according to different studies, this condition is worse in patients affected by unilateral spatial neglect; in particular, right hemisphere lesions determine an incidence of dysphasia higher than left hemisphere lesions. Deglutition ability should be assessed at the hospital admission in order to start enteral nutrition within the first 5-7 days in patients with normal nutritional status and within 24-72 hours in those with malnutrition. Continuing assessment of the degree of dysphagia, weight and intake monitoring, can offer an overall view of the condition, and make possible a prompt communication of the evolution of the dysphagia status to the other health care professionals. It is a nursing responsibility to enhance patient recovery especially through education about self-care eating abilities. Neglect patients need nursing care mostly in early stages of a stroke event, with the assessment, case by case, for the suitability of feeding or self-feeding.

Neglect condition makes the patient fail to report, respond, or be aware of contralateral stimuli. This neurological condition results in a general difficulty to perform some daily life actions, like handling the food in the plate and mastication, which can often lead to a higher malnutrition risk. A Personalized dietary adherence ensures BMI gain (or maintenance) between 18.5 and 24.9 Kg/m<sup>2</sup>; this range indicates an adequate nutritional intake and, therefore, less vulnerable conditions in order to reduce risk of complications.

Several studies have shown how malnutrition results in a higher risk of pneumonia, because the body, without the essential elements derived from adequate diet, would be exposed to higher respiratory tract infections. Both antibiotic prophylaxis and adequate oral decontamination, through daily tooth brushing, seem to be effective in reducing oropharyngeal Gram-negative bacteria colonization. Many studies report that Mediterranean dietary models provide essential elements to the body and prevents up to 30% of ischemic stroke events, due to the well-known antioxidant, anti-inflammatory, antiatherogenic and antithrombotic action of many components of this dietary model.

In conclusion, patients affected by hemispatial neglect have a neurological disability that does not allow them to self-perform many of the daily-life activities. Nurses should be aware of the neglect patients' health needs as well as the risk related to this condition, in particular, the high of malnutrition. Nurses can play a leading role in managing neglect patients care, for this reason, training and efforts should be done to produce programs, protocols and guidelines in order to assess and plan specific nursing care actions. Therefore, a more attentive approach to the management of the neglect aspects is desirable to reduce risks related to this condition, to facilitate prompt recovery of stroke patients and to improve the outcome of this disease and the quality of life of these patients.

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### Conflicts of Interest

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Correspondence:

Fabio Fabbian, MD, PhDc, Associate Professor,  
Department of Medical Sciences, Faculty of Medicine Pharmacy  
and Prevention  
University of Ferrara, Via L. Ariosto 35  
44121, Ferrara (Italy)  
Tel. +390532237071  
Fax +390532293031  
E-mail: fbbfba@unife.it