Routine Assessment of Nutritional Status at Admission to Neurorehabilitation and Evaluation of Indication for Nutritional Strategies using the Innsbruck Nutrition Scale





Abstract

Obiective

Neurogenic dysphagia is observed in 30-45% of stroke survivors in the early phase, 50% of these patients experience malnutrition, one third develops pneumonia.

Malnutrition often provokes poorer rehabilitation potential and impaired functional outcome.

Method

45 stroke patients (pat.) were assessed using INS (Innsbruck Nutrition Scale), included parameters see below. With an easy scoring system clear, moderate and absent indication for clinical nutrition strategies are established (enteral, parenteral nutrition). Setting: inpatient neurorehabilitation, therapy mainly according to the principles of Bobath, Affolter, PNF, speach therapy, direct and indirect swallowing therapy including compensatory strategies, neuropsychological and psychological support.

Statistics

Values are expressed as median/mean or percentage as appropriate, for non parametric difference testing we used U-test 2-tailed. Levels of significance: * (p<0,05), ** (p< 0,01).

Results

Outcome in rehabilitation was measured calculating the difference of Barthel Index (BI), of Basic and Extended Activities of Daily Living (BADL EADL) and of Rivermead Motor Assessment (RMA) at admission and discharge: Delta values: median delta BI 50

median delta BADL 4 median delta EADL 2, median delta RMA 4.

Nutritional status:

Median BMI 25 kg/m2 (min18 - max39), Quotient BUN/Creatinine 17(min9- max37), Loss of weight in the early recovery phase 21 (51%) pat. lost less than 2kg, 7 p (17%) lost 2-3 kg, 9 p (22%) lost 3-6,5kg, 4 p (10%) > 6,5kg.

Estimated days of oral alimentary abstinence (oral intake below 500kcal/day) at beginning of rehabilitation: 29 pat. (71%) less than 2 days, 1 pat. (2%) 2-5 days, 11 pat. (27%) > 5 days.

According to INS in 28 pat. (68%) clinical nutrition was not indicated, in 2 pat. (5%) moderately and in 11pat. (27%) strongly indicated, they also received intensive swallowing therapy. The group of 11 pat. with severe neurogenic dysphagia and actual malnutrition showed a highly significant better outcome as measured by BI (p = 0,0002) and BADL (p = 0,001) compared with not swallowing disturbed patients even when BI was corrected for swallowing specific items.

25 patients had a BMI > 25, nevertheless 7 of these p had the need for clinical nutrition.

Conclusion

Assessment of nutritional status at start of rehabilitaton is very feasable and shows a typical pattern for the incidence of dysphagia after stroke. Establishing the indication for clinical nutrition using this score system is very easy and reflects best clinical practice. In a rehabilitation scenario offering specific swallowing therapy we also could show a highly significant better outcome for patients with severe neurogenic dysphagia/ malnutrition at admission.



INS - Innsbruck Nutrition Score

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Introduction

According to former investigations (1,2,3) malnutrition is frequently observed after major stroke, is usually associated with neurogenic dysphagia and/or impaired vigilance. The incidence of dysphagia in patients with acute stroke ranges from 35-40%. Malnutrition represents a risk for decreased immunity and nosocomial infections. Malnutrition is also associated with impaired functional outcome after stroke, a slower rate of recovery, poorer rehabilitation potential and higher mortality. In hospitals without routine nutritional assessment and individual nutrition management plans the risk of patients developing malnutrition may be increased. Parameters of nutritional status usually are weight, BMI, mid upper arm circumference, serumalbumin, nutritional scales. A very short and feasable score for assessing the nutritional status – also appropriate for stroke patients – is the Innsbrucker Nutritional Score. (see table 1)

Purpose

The aim of our study was standardized evaluation of nutritional status at admission for neurorehabilitation, to follow up nutritional and functional development, and to assess the impact of adequate nutrition on outcome in neurorehabilitation.

Methods

Setting: Specialized neurorehabilitation center, 43 beds for comprehensive inpatient rehabilitation. Postacute and chronic scenarios, therapy according to the principles of Bobath, Affolter, Perfetti, proprioceptive neuromuscular facilitation (PNF), forced use if indicated, lactat adjusted tread mill training with/without partial body weight support, 24 h Bobath and Affolter rehabilitation nursing. Clinical nutrition therapy, cognitive computer assisted exercises, speech and swallowing diagnosis and therapy (Castillo Morales, MODAK, NAT, FOTT) including compensatory strategies (FEES/, FDT/functional dysphagia therapy), neuropsychological and psychological assessment, training and support, caregiver involvement and - training, social support, recreational therapy.

Statistics:

Values are expressed as median/mean or percentage as appropriate, for non parametric difference testing we used U-test 2-tailed. Levels of significance: * (p<0,05), ** (p< 0,01).

Baseline characteristics of study population

45 patients were included

complete data were obtained in 41 patients inpatient rehabilitation: 33 patients after stroke, 8 patients after spontaneous intracerebral hemorrhage gender: 32 male (78%), 9 female (22%)

median age: 67 years (25 percentile 60, 75 percentile 74) median time since onset of signs and symptoms: 6 weeks (25 percentile 4, 75 percentile 9)

Outcome in Rehabilitation



Results Outcome in Rehabilitation

Subgroup of 11 pat. with severe neurogenic dysphagia and actual malnutrition: highly significant better outcome as measured by BI (p = 0,0002) and BADL (p = 0,001) compared with not swallowing disturbed patients even when BI was corrected for swallowing specific items.

BI (Frühreha-Barthel Index) disability scale



BADL (Basic Activities of Daily Living) disability scale



Nutritional Status

Loss of weight kg (%)	Katabolic Index (BUN/Crea)	Points	Patients (n)			
< 2 (51%)	< 15 (11 p)	0	21			
2 - 3 (17%)	15 - 25 (26 p)	1	7			
3 - 6.5 (22%)	25 - 35 (5 p)	2	9			
> 6.5 (10%)	> 35 (1 p)	4	4			
	Loss of weight kg (%) < 2 (51%) 2 - 3 (17%) 3 - 6.5 (22%) > 6.5 (10%)	Loss of weight kg (%)Katabolic Index (BUN/Crea) $< 2 (51\%)$ $< 15 (11 p)$ $2 - 3 (17\%)$ $15 - 25 (26 p)$ $3 - 6.5 (22\%)$ $25 - 35 (5 p)$ $> 6.5 (10\%)$ $> 35 (1 p)$	Loss of weight kg (%)Katabolic Index (BUN/Crea)Points< 2 (51%)			

Alimentary Intake

Estimated days of oral alimentary abstinence (oral intake below 500kcal/day) at beginning of rehabilitation:

Abstinence days	Points	Patients n (%)		Indication	Points	Patients n (%)	
< 2	0	29 (71%)		absent	<= 2	28 (68%)	
2 - 5	2	1 (2%)		moderately	3 - 4	2 (5%)	
> 5	5	11 (27%)		strongly	>= 5	11 (27%)	
			table 3				

25 patients had a BMI > 25 kg/m2, nevertheless 7 of these patients had the need for clinical nutrition.

Conclusion

- reflects best clinical practice.
- malnutrition at admission

References

- Erwachsenen (Hrsg.) AKE, Wien; 2000



RMA (Rivermead Motor Assessment)



subgroup with severe neurogenic dysphagia patients with normal alimentary intake

MD 2 MD 9 MD 16

EADL (Extended ≈ Instrumental Activities of Daily Living) handicap scale

patients with normal alimentary intake



Indication for Clinical Nutrition

1. Assessment of nutritional status at start of rehabilitaton is very feasable and shows a typical pattern for the incidence of dysphagia after stroke.

2. Establishing the indication for clinical nutrition using this score system is very easy and

3. In a rehabilitation scenario offering specific swallowing therapy we also could show a highly significant better outcome for patients with severe neurogenic dysphagia/

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