Rehabilitation in Intensive Care Unit: a protocol for auditing current practice (RE-BREATH: REhaBilitation of REspiratory failure AudiT in Hospital)

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Background

Rehabilitation in Intensive Care Units (ICUs) is crucial for the prognosis of the patient. Because of the detrimental sequelae of long-term bed rest, rehabilitation throughout the critical illness and thereafter is needed to address these effects. Prior to fully implementing the guidelines, an audit of current practice had to be undertaken, thus the purpose of this study. A new systematic approach, based on daily assessment of patients' rehabilitative needs rather than an occasional approach consequent to the demand of the physician who has the patient in care, has been recently introduced in the current rehabilitative practices in the ICU of Ospedali Riuniti of Ancona. A clinical audit (RE-BREATH: REhaBilitation of REspiratory failure AudiT in Hospital) has therefore been conducted in order to evaluate the impact of this new expert-driven rehabilitative management of patients with respiratory failure in ICU.

Aims

The aims of this audit were: 1) to measure the adherence of physicians' behaviors to the recommended best practice; 2) to improve rehabilitative service quality measuring the impact on clinical and organizational outcomes, eventually exporting the model to other settings. The relevance of this audit is underlined by high costs, high volume, high variability and high complexity of the rehabilitation management in critical care.

Methods

After a proper literature research, a multidisciplinary team made by methodologists, physiotherapists, physiatrists and anesthesiologists gathered up in order to select evidence-based recommendations about expert-driven rehabilitative management of patients hospitalized in intensive care units and to agree upon criteria to build indicators. The preliminary phase lasted two months, with several team meetings during this period. A 15-day pilot audit has been conducted to test the feasibility and to refine the protocol.

Setting

Two Intensive Care Units (ICU) (28 beds) sited within a regional teaching hospital.

Study design

Prospective data collection and analysis (the enrollment period lasted two months and about 150 patients were included).

Population

Inclusion criteria: patients admitted in ICU from the end of April 2015 to the end of June 2015.
Exclusion criteria: patients in pharmacological sedation; patients dismissed, deceased or moved to another ward in less than 24 hours from the admission.

Working group

A multidisciplinary team made by physiotherapists, physiatrists and anesthesiologists has been involved in the study. The project was conceived and led by a small sub-group of methodologists with expertise in projects of evidence-based medicine, particularly those concerning the improvement of the quality of care. Health professionals involved in data collection (physiatrists and physiotherapists) were specifically identified and trained before the audit started.

Data collection

Data were collected by a dedicated data entry paper table prospectively filled by the physiotherapists team, encoded to be analyzed using MS Excel®. Results were then reported as means and percentages as appropriate.

Identification of standards of care and quality indicators

The criteria were derived from the NICE guideline "Rehabilitation after critical illness", published in 2009. A consensus list of data items to be captured was identified by the audit team during preliminary meetings. These items, including patient demographics, reason for admission, time to referral for rehabilitation management, subsequent physiotherapy path, hospital length of stay and ventilator-free days were included as part of the audit. 7 quality indicators were defined and monitored: 1 to 5 are process indicators, while 6 and 7 are outcome indicators.

Statistical analysis

Non-parametric statistical tests.

Results

General characteristics of the population are shown in the table (Fig. 1). Regarding the **process indicators** (Fig. 2), it emerges that the clinical practice already meets good standards, except for indicator 5. This could be explained considering that patients which didn't receive the global revaluation during their stay were only those who were discharged the day after the first evaluation. In particular, this problem affected those who were admitted in a pre-holiday and then moved or discharged the following day. Moreover, regarding the **outcome indicators**, the preliminary data show that the average length of stay was lower than the historical benchmark. It's important to consider that, even if the data analysis is still ongoing, the subgroup of COPD patients had the worst prognosis, reflected by a longer **length of stay** and a smaller number of **ventilator-free days**. Furthermore, when the observational period was concluded, a feedback questionnaire, whose results are being elaborated, has been released, in order to collect opinions and suggestions about this study among involved professionals (Fig. 3)

Discussion and Conclusion

The rehabilitation performed in ICUs is often inadequate and, as a rule, there is a need to standardize pathways for clinical decision-making and education and to define the professional profile of physiotherapists in detail. In our experience an expert-driven rehabilitative management of patients with respiratory failure hospitalized in intensive care units has great impact, promoting a systematic approach based on daily assessment of patients' rehabilitative needs rather than an occasional approach consequent to the demand of the physician who has the patient in care. As a consequence, an improvement in patients' prognosis eventually causing a reduction of ICU length of stay and/or other clinically significant variables (e. g. ventilator-free days) could be obtained. Furthermore the collected data will be used as a good starting point for possible future research. Provision of evidence-based medical and rehabilitative management in this setting was challenging due to environmental, social and local health system issues. Thus, available best evidence on ICU rehabilitation has to be contextualized to draft recommendations relevant for the local setting. The promising results obtained so far allow us to pursue this ambitious project, aimed to identify possible strengths and weaknesses of usual clinical practice in an area of interest lacking strong high quality evidence.

Main bibliography
NICE guideline "Rehabilitation after critical illness", 2009
Physiotherapy for adult patients with critical illness: recommendations of the European Respiratory Society and European Society of Intensive Care Medicine Task Force on Physiotherapy for Critically Ill Patients. Intensive Care Med 2008, 34:1188-1199

Fig. 1 Population: general features

POPULATION GENERAL FEATURES	
Age (mean)	59.2
Male sex (%)	67.3
Italian citizenship (%)	93.5
Main reason for admission (%)	
not-scheduled surgery intervention	44.4
medical intervention	34.6
scheduled surgery intervention	20.9
Main patient feature (%)	
Postsurgery	39.2
Postneurosurgery	19.6
Transplanted	6.5
COPD exacerbation	3.9
Previous ward (%)	
First Aid	24.8
Neurosurgery	20.9
General Surgery	9.8
Emergency Medicine	7.2
Vascular surgery	4.6
Transplant surgery	4.2
Liver surgery	3.9
Thoracic surgery	3.3
Emergency surgery	2.6
Location after discharge/transfer (%)	
ICU in other hospitals	20.3
Neurosurgery	9.8
Transplant surgery	9
General surgery	9
Orthopedy	6.8
Longterm-care/Rehabilitation-care	5.3
Liver surgery	4.5
Emergency surgery	4.5

Fig. 2 Indicators, standards and results

Indicator number	Indicator definition	Result		Standard	
1	Healthcare professional identified to coordinate the rehabilitation care pathway	100%		100%	
2	Short clinical assessment performed to determine the risk of developing physical and non-physical morbidity	100%		> 95%	
3	Patients identified as at risk of physical and non-physical morbidity who had a comprehensive clinical assessment performed to identify the current rehabilitation needs	100%		100%	
4	Short-term and medium-term rehabilitation goals set with an individual structured rehabilitation programme included	100%		100%	
5	Comprehensive clinical reassessment to identify their current rehabilitation needs.	95.4		100%	
		During audit period		**2013**	
6	Average lenght of stay	15.5	IC95% (14.7-16.3)	17.5	IC 95% (17.2-17.8)
	COPD	28.5			
	postsurgery	16.5			
	transplanted	5.4			
7	Ventilator free-days	3.6			
	transplanted	4.1			
	postsurgery	4			
	COPD	2.8			

Fig. 3 Feedback questionnaire

Questions
Have you noticed a change in the organizational system regarding the management of inpatient rehabilitation in the ICU?
Do you think the constant presence of professionals as Physiatrist - Physiotherapist in the Intensive Care Unit is appropriate for the management of the process of rehabilitation?
Do you think the collaboration and integration between the different health care professionals involved in the management of patients admitted to the ICU (Anesthesiologists, physiatrists, nurses, physiotherapists) is useful?
Do you think that this new organizational model will improve the quality of service for the benefit of the patient?
Do you think the continuation of this organizational system could be useful ?
Do you have any suggestions?