Post ICU Rehabilitation
Serafeim N. Nanas
Professor of Critical Care Medicine
Evaggelismos Hosp., Medical School
National & Kapodestrian University of Athens

1st European Conference on
Weaning & Rehabilitation in Critically Ill Patients
INTERNATIONAL EARLY MOBILISATION NETWORK

During two last decades
- Improved ICU Medical Care
  increased survivors after severe
disease
- Morbidity
- Mortality
- ICU & Hospital stay

Effective strategies in ICU
- Better instrumentation (Ventilators, CRRT)
- Protective ventilation
- Early goal directed therapy
- Less Sedation
- Early Mobilization & Rehabilitation
- END POINT 28 or 90 days outcome:
  ICU or Hospital mortality
- Limited Long Term Data.

Recent strategies in ICU increase
effectiveness
- Post ICU Disability Syndrome
- Heterogeneity of ICU Survivors
- Post ICU Rehabilitation RCTs
- Need for Multidisciplinary Approach
- Challenges - Prospective

Synopsis

During two last decades

Improved ICU Medical Care
increased survivors after severe
disease
- Morbidity
- Mortality
- ICU & Hospital stay
ICU SURVIVORS I
The Magnitude of the problem

- Multiorgan dysfunction
  - Pulmonary
  - Renal impairment
  - Neurocognitive
- Physical
  - ICUa Weakness 25% - 60%
  - Polyneuromyopathy
  - Dysphagia
  - Heterotopic Ossification

ICU SURVIVORS II
The Magnitude of the problem

- Delirium, cognitive disorders
- Lethargy
- Depression 17-43%
- Anxiety 23-48%
- PTSD (Post traumatic stress disorder) 20-55%
- Health Related Quality of Life
- Family dysfunction

Dysphagia, a Common disorder

- In patient without brain injury
- Is very prevalent in patients with ICUa Weakness (10 fold increase risk for aspiration)
- Aspiration - Pneumonia
- morbidity & mortality
- In our step down Unit 30% Dysphagia (48/165)
  - Malandraki G et al, 2012

Severity of dysphagia

- Videofluoroscopic Swallow Evaluation

Malandraki G et al, 2012
Neurocognitive Dysfunction

- Undetected
- Only in memory
- Persist - 70% at discharge
  - 47% at 2yrs
  - up to 6yrs post-discharge
  - Rothenhausler HB et al. Gen Hosp Psychiatry 2001;23(2):90-6
  - 33% at 6 months post-discharge

- Delirium is related to
  *Neurocognitive Dysfunction*
  *Sepsis & Cytokine mediation*

- 33% at 6 months postdischarge

- 821 pts enrolled
- IQCODE, CDR
- cognitive impairment @ baseline: 6%
- Delirium during hospital stay: 74%
- Multicenter study
- Medical/surgical ICUs
- Respiratory failure, Cardiogenic or Septic Shock
- Long Term Cognitive impairment after ICU
  Pandharipande et al., 2013, NEJM, 369, 1306-16

Global cognition scores in ICU survivors

- scores of moderate traumatic brain injury
  - 40% at 3 months
  - 34% at 12 months
- scores of mild Alzheimer’s disease
  - 26% at 3 months
  - 24% at 12 months

- ↑ delirium duration was associated to ↓ cognition scores

Prevention of Neurocognitive Dysfunction

- A. Awakening
- B. Breathing trials
- C. Choice of sedation and analgesia
- D. Daily delirium monitoring
- E. Early mobility

*3 times more likely to return to independent functioning*
Complication in family members of ICU survivors

- Anxiety
- Depression
- PTSD (40%) up to 6 months later
- HADS (Hospital Anxiety and Depression Scale)
- IES (Impact of Events Scale)

References:

Rehabilitation after Critical illness

- RCT, 6 months, 126 ICU survivors
- Intervention: 6 weeks self-help rehabilitation manual
- SF-36, HAD
- End points: Physical Function, Depression, PTSD
- 8 weeks, 6 months

Post Traumatic Stress Disorder

- Multicentre
- 160 intervention 162 standard care
- Intervention: Diary vs Standard care
- 8% less PTSD
- PTSD 21 (13.1%) vs 8 (5%) 0.02*

A self-help rehabilitation manual is effective in aiding physical recovery and reduction depression.
Post Traumatic Stress Disorder


- Multicenter RCT, 200 ICU survivors, self care, (gastr, 30% resp. 24%, CV 20%, Sepsis 8%, Tr 6%)
- Interv: 8 weeks Home Based Rehab Programme,
- HRQoL
- SF-36, 6 MWT, DASS-21, IES
- No significant difference : Physical & Functional
- Small number, placebo effect, compliance??
- Close to normal?? Heterogenous group!!

Exercise Rehabilitation of ICU survivors

Linda Denehy et al Crit Care 2013, 17:R156,

- RCT, 150 ICU survivors,
- Intervention: Exercise in ICU, the Ward, and 8 weeks as outpatients
- TUG, 6 MWT, Physical Function, SF-36, AQL
- 12 months Follow up : No Difference

Exercise Rehabilitation of ICU survivors

Linda Denehy et al Crit Care 2013, 17:R156,

- 12 months Follow up : No Difference
- Increased 6MWT change over time on intervention group
**PRaCTICAL study**
Cuthbertson BH, BMJ 2009;339-b:3723

- RCT, multicentre 286 ICU survivors, 12 months
- 3 UK hospitals
- Nurse led intensive care follow-up programme vs standard care
- SF-36, HADS, Cost effectiveness, HCQoL
- No difference

**Early Cognitive & Physical Rehab ACT-ICU**
Brunnel NF et al Phys Ther 2012; 92 (protocol)

- RCT,
  - Usual Care,
  - Early mobility / Physical Rehabilitation
  - Cognitive & Physical rehabilitation
- 3 & 12 month follow up assessment
  - Executive Function
  - Functional Mobility
  - Global Cognitive Function

**TeleRehabilitation**

Post ICU Rehabilitation using telemedicine services
A feasibility study

**Tele Rehabilitation**

Why Telerehab?
- Home the best environment
- Utilization of current technology
- Improvement of compliance
Cognitive and physical rehabilitation of intensive care unit survivors: Results of the RETURN randomized controlled pilot investigation  

- **Feasibility Study** (8 intervention 9 control)  
- **Intervention**: 6 in person visits for cognitive rehabilitation+ 6 televisits for physical (endurance and strength exercises) and functional rehabilitation VS usual care  
- **Primary outcomes**: TOWER and TUG test

A multicomponent rehabilitation program for ICU survivors combining cognitive, physical, and functional training appears feasible and possibly effective in improving cognitive performance and functional outcomes in just 3 months.
ICU Follow-up Clinic

- Doctor
- Nurse
- Psychiatrists
- Respiratory Therapists
- Physical Therapists
- Social Workers
- Speech Specialist

- ICU, Step Down Unit
- Ward,
- Rehab Center,
- Outpatient follow up

Goals of Care

- Spiritual needs
- Psychological concerns
- Physician-patient-family communication


Limitation of Post ICU Rehabilitation

1. Lack of evidence - RCTs with small numbers
2. Specific groups - isolated modalities
3. Cost effectiveness has not been shown
4. In Clinical practice The lack of continuous after ICU discharge

SYNOPSIS I

- ICU Survivors a population with high Morbidity, Heterogeneity and broad spectrum of symptoms
- NMES seems to be effective as prevention as well as for therapy of ICU acquired Weakness. It is well tolerated and easy to applied It may be incorporated in holistic approach
- Dysphagia is a overlook common problem
- The post ICU Studies up to Now included small number of patients, with specific morbidity, and isolated modality of intervention

SYNOPSIS II

- ICU Follow up Clinic with a Multidisciplinary Team, Patient and Family may be effective, It has to be tested.
- More studies are needed to rehabilitation models suitable for individual patient for long term functional and neuropsychological impairment
- Co-ordinated, multiprofesional rehabilitation program begins at the admission in ICU, and continue in step down Unit, Ward, Rehabilitation center and community
- Individualized for each patient
Thank you for your attention!!