Long-term outcome and quality of life in patients with Guillain-Barré-Syndrome requiring intensive care and mechanical ventilation

Objective: To analyse functional long-term outcome and quality of life in patients with Guillain-Barré-syndrome (GBS) treated in an intensive care unit and requiring mechanical ventilation.

Background:
In the majority of patients the prognosis after Guillain-Barré-Syndrome is favourable. However, 3-10% of patients die\(^1\). The proportion of patients with a poor outcome is highest among ICU-patients that required mechanical ventilation during the acute phase\(^2\).

Most studies leading to common notions about GBS-patients treated on an ICU have been carried out in a patient cohort between the mid 70s and the mid 90s of the last century \(^3\)-\(^6\). During and after this period common treatment regimens have changed. In particular intravenous immunoglobulins (IVIG) have gained significance whereas, for example, glucocorticoids alone have been shown to be ineffective \(^7\).

Therefore it is likely that the results of these studies do not entirely reflect the clinical outcome of GBS-patients after mechanical ventilation nowadays. Moreover, so far, morbidity and outcome asessement of surviving patients has been carried out using a limited spectrum of clinical scores \(^8\)-\(^10\).

Thorough clinical outcome and quality of life asessement in a large population of GBS-patients that required mechanical ventilation is not available yet. Notably, the influence of chronic fatigue on the quality of life has not been studied sufficiently.

Therefore the focus of the present retrospective multicenter study is to evaluate long-term outcome and quality of life \(>1\) year after mechanical ventilation on the ICU.

Inclusion criteria
- Diagnosis of Guillain-Barré-Syndrome \(^11\)
- Mechanical ventilation
- Symptom onset before 08/2010

Data acquisition

-Data to be obtained from the patients’ medical records

GBS-patients that were mechanically ventilated and treated in an ICU of one of the participating centers some time between January 1999 and August 2010 are eligible for study participation.

Patients characteristics including age and sex are recorded.

Further parameters (where available) extracted from the medical records include (compulsory parameters printed bold):

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- Latency between first symptoms and hospital admission
- Total length of hospital stay
- Length of stay in the ICU
- Latency between symptom onset and intubation
- Latency between hospital admission and intubation.
- Concomitant diseases (respiratory, infectious, general)
  - Bilateral facial paresis
  - Paresis of upper extremity
  - Bulbar symptoms
  - Autonomic dysregulation
- Result of CSF-analysis (cell count, lactate, protein, glucose)
  - Time from symptom onset to first CSF-analysis
  - Serology: leukocyte count, CRP, liver enzymes (GOT/GPT/ gamma-GT) on admission
  - Body temperature on admission
- Preceding infection (gastrointestinal/pulmonary/other)
  - Preceding vaccination (within 4 weeks before hospital admission)
- Evidence of campylobacter jejuni infection
  - Evidence of other GBS-related infection (EBV, CMV, Mycoplasma pneumoniae, Haemophilus - influenzae)
  - Detection of gangliosid antibodies
- Time from admission to intubation
  - Indication for intubation: emergency (non-suspendable) versus elective (suspendable for at least one hour)
- Duration of mechanical ventilation
  - Insertion of a tracheostomy
  - Electrophysiological results (demyelinating versus mixed peripheral nerve lesion)
- Complications occurring during the ICU stay (tracheobronchitis, pneumonia, pneumothorax, tracheostomy-related, sepsis, gastrointestinal bleeding, DVT, SIADH, acute renal failure, newly diagnosed malignoma)
  - General ICU therapy (use of catecholamines, sedation, muscle relaxation, antibiotics)
  - Time of initiation of specific GBS-therapy
  - Latency between symptom onset and therapy initiation
- Specific GBS-therapy (IVIG, plasmapheresis, steroids, immunadsorption, other)
  - Sequence of GBS-therapy
  - One or two courses of IVIG

These parameters (where available) will be tested as outcome prediction parameters.

- Follow-up asessement / questionnaires
Follow-up assessment will be carried out using standardised telephone interviews using the scores listed below:

- GBS-disability-scale score (Hughes et al, 1978)
- Barthel-Index
- EQ-5D
- Fatigue severity scale score (FSS)

Consent to study participation
Informed consent will be obtained from all patients or their next of kin.

Statistical analysis
Kolmogorov-Smirnov and Shapiro-Wilk tests will be used to determine the distribution of the data.
To assess correlations between baseline variables, the Pearson Correlation will be used for continuous variables, Spearman rho will be used for categorised variables. Pearson ² and Fisher exact tests will be used to assess associations between categorised variables. The Mann-Whitney- U test will be used to
determine intergroup differences between continuous variables. A value of $P=0.05$ will be considered statistically significant. Multivariate regression analysis will used to analyse independent predicting factors for survival and dichotomised outcome parameters e.g. the score on the GBS-disability-scale: 0-1 („healthy“; „minor signs or symptoms“) versus 4-6 („confined to bed“; requiring assisted ventilation“; „dead“).

**Literature**