Summary

Inroduction: The S100B protein is a small dimeric protein which belongs to a group of calcium binding proteins. It is found in astroglial cells in the central nervous system (CNS). The S100B protein is detected, at very low concentrations, in fat tissue, muscle and bone marrow. We can measure this marker in the cerebrospinal fluid, in serum and in urine. The commercially available assay measures the sum of two different dimers (the S100A1B and S100BB) which collectively are called the S100B protein.The level of this marker increases significantly in patiens with CNS damage. Studies of patients with isolated head trauma have demostrated a correlation between serum marker level, neurological findings and outcome. In patients with polytrauma there is a problem to evaluating the initial S100B protein level with regards to CNS damage, because the S100B protein level can be affected by extracerebral sources of the S100B protein.

Aim of study: The aim of our study was to evaluate the significance of the S100B protein in patiens with either isolated head trauma or polytrauma and to evaluate the significance of the initial level and the significance of dynamic monitoring of the S100B protein levels. The importace of these levels for predicting primary CNS damage, and for making a prognosis of such patiens was also evaluated. Next aim was to evaluace whether there really are extracerebral sources of the S100B protein in patients with polytrauma, and if these sources are eliminated over time. We wanted to select a right interval of the S100B protein sampling.

Patients and Methods: 50 healthy volunteers and 232 patients were included into this study. There were 128 patients with an isolated head injury and 104 patients with polytrauma. The time period from injury to admission was shorter than 6 hours. All patiens had an initial CT scan of the head. To evaluate patients we used scoring protocols : GCS, APACHE II, TRISS, GOS, KPS. Like a favourable outcome we rated GOS 4-5 or KPS 80-100, like an unfavourable outcome we rated patiens with GOS 1-3 or KPS 0-70. The S100B protein level was done by LIA Essay on a fully automated immunoanalyser Liaison, Dia Sorin, Sweden. The normal level of the S100B protein was established by examination of 50 healthy volunteers and was found to be 0,2 mikrog/L. The S100B protein levels were assessed on admission, and then after 6, 12, 24 and 72 hours. Statistical analysis was performed with SW Cran using ANOVA. Data analysis was tested to evaluate the differences among the Gross by use Spearman Correlation Coefficiens, Odds Ratio and Chi-square test. The statistical significance was determined at the level of $p<0,05$.

Results: We demostrated that the initial level of the S100B protein correlates very well with the scoring systems, it means with the severity of a CNS damage, but it poorly correlates with CT scan findings in patients with an isolated head injury patients. The S100B protein levels at 24 and 72 hours correlate significantly with outcome. We demonstrated that the initial S100B protein levels in patiens with polytrauma are affected by extracerebral sources of the S100B protein and they have a poor correlation with a CNS damage. The elimination of the extracerebral sources occurs from 24 to 72 hours. S100B protein level in 72 hours correlate with outcome. Dynamic monitoring is very important, because it improves the prognostic potential of the S100B protein. Early normalization of the levels is crutial for prognosis of patiens.

Conclusin: This study demonstrated the importace of the dynamic monitoring of the S100B protein levels in patiens with a head trauma. It is especially important in patiens with a head trauma and other injuries. The initial level correlates with outcome poorly than the next levels in 24 and 72 hours. The evaluation of the dynamic evolution of this marker can help us in estimation of prognosis a can help us in decision about decision on the degrre of care. This study could improve our informations on the patients with not estimable patient´s clinical condition due to the pharmacological sedation..