POC Diagnostics

Brain Injury?  Risks?

S100B and IL-6
will quickly help you decide
In Germany about 273,000 people suffer from traumatic brain injury (TBI) per year. Over half of the cases happens at home or at recreation activities; traffic accidents only rank third. Noticeably high is the part of children below 16 years: It is nearly 30%; especially often affected are two- or three-year-old children.

TBI are injuries, which are caused by beat, hit or sling movement of head and brain. TBI can be classified based on severity: Mild, moderate and severe. For moderate or severe TBI the symptoms can be relatively good assigned to a clear diagnosis, but for mild TBI diagnosis it is much more difficult and the consequences are often underestimated (for example sport injuries).

As well the detection and prognostic assessment of non-traumatic brain injuries, for example caused by cerebral ischemia, is very important.

Beside the established neuroradiologic imaging for diagnosis and observation of progress, biochemical parameters like S100B protein represent more and more an important supplementation.

**S100B**

S-100 belongs to the S-100-Calmodulin-Troponin superfamily. It is a calcium-binding protein in the cytosol and acts as a regulatory protein. As a dimer S-100 consists of two isomeric subunits: S100α und S100β. The relevant subform for neurological damage is S100ββ (S100B); it is present in the cytoplasma of brain cells (in astrocytes 100-fold higher than in chondrocytes, Langerhans-cells and melanoma cells). Release of S100B into the blood needs a disturbance of the blood-brain-barrier.

**Advantages:**
- High specificity for nerve tissue, due to short half life optimal for early detection and progress observations, can be measured in different body fluids (serum, cerebrospinal fluid), gentle for the patient.

**Neuromonitoring**

In case of suspicion S100B determinations can support clinicians of divisions of traumatology, intensive care, neurology and pediatrics in their therapy decisions at the following situations:

- Traumatic brain injury: Correlation with intracranial injuries, severity, triage
- Mild TBI: Savings/supplementation computed tomography (lit. 2)
- Secondary injuries
- Cerebral ischemia /stroke: Correlation severity
- Perinatal asphyxia: Estimation of risk and prognosis (lit. 3)

**Recommendations:**
No single measurements for diagnosis, but daily monitoring; registration of all injuries and surgical insults; supplementation to clinical picture, to imaging and neurophysiological procedures as well to other lab parameters.

**Caution:**
Unspecific increase can be due to: Hemorrhagic shock, hypoxia, local ischemia, open fractures, organ reperfusion, trauma of other body parts, inflammation/SIRS, adipositas.
In general do not use different lab methods during patient monitoring (relatively bad comparability, lit 2).
For prognosis/therapy monitoring of different stages of malignant melanoma the subform S100AB is used.
Patients with severe head injury brain damage itself is a risk factor for developing pneumonia. Early hints can support the attending physician to work on a successful treatment strategy – fitting the immune status of individual patient.

The study of Schlosser et al. (Lit. 4) could show, that patients with elevated IL-6 levels (cut-off 94 pg/mL) at the time point of admission (2-24h after trauma) have an elevated risk to develop a pneumonia. 32 patients with isolated severe head injury were determined by the IL-6/PicoScan-System: The positive predictive value for the prediction of pneumonia risk was 100%, the negative predictive value was 86%.

So simple is Milenia® QuickLine POC Diagnostics

Example IL-6:
1. Add 50 µL whole blood to the test unit.
2. Add one drop of buffer.
3. Place the test unit into the PicoScan reader and run the IL-6 program.
   The system automatically displays the result after 25 minutes.
4. Read the IL-6 value.

Literature Recommendation

Point-of-Care-System for Intensive Care Medicine

- Allows realtime therapy decisions
- Rapid, simple, flexible
- IL-6 and S100B: Directly from whole blood
- Very low staff requirements
- Objective, quantitative interpretation with PicoScan

Order Informations

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Order Code</th>
<th>Package Size</th>
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<tbody>
<tr>
<td>Milenia® QuickLine IL-6 Whole Blood</td>
<td>MQL6B 1</td>
<td>20 Tests</td>
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<td>MQL6 1</td>
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<td>Milenia® QuickLine IL-8</td>
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<td>New! Milenia® QuickLine S-100B</td>
<td>MQLNS 1</td>
<td>20 Tests</td>
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<td>New! Milenia® QuickLine TNF-α amniotic</td>
<td>MQLTA 1</td>
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<tr>
<td>PicoScan System</td>
<td>PicoScan</td>
<td>System + Software</td>
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Under development: CRP, IP-10, IFN-γ, StrepB

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