Consensus from expert panel & software for Multimodal Monitoring

The new Consensus paper (Hutchinson et al., Intensive Care Med. 2015) from the International Microdialysis Forum meeting in Cambridge includes: experts guidance for use of microdialysis in traumatic brain injury and subarachnoid hemorrhage, catheter location, reference values and interventions. Find below a few conclusions from the paper:

- Low brain glucose is associated with unfavorable outcome.
- An increase in the Lactate Pyruvate (LP) ratio in the presence of low pyruvate (and low oxygen) indicates ischemia.
- An increase in the LP ratio in the presence of normal or high pyruvate (and normal oxygen) indicates mitochondrial dysfunction.
- A high LP ratio is associated with unfavorable outcome.

ICUpilot - software for multimodal monitoring

ICUpilot is a unique tool for multimodal monitoring in the ICU. Bedside Patient Monitors (showing e.g. pulse, blood pressure, ICP, CPP) as well as the Microdialysis Analyzer can be connected to a separate computer for on-line analysis and comparison of all data collected bedside during the entire care of the patient.

Literature:


Chen et al. Department of Neurosurgery, Legacy Emanuel Medical Center, Portland, USA.


Jane Skjøth-Rasmussen, Mette Schulz, Soren Risom Kristensen, Per Bjerre.

Bedside Diagnosis of Mitochondrial Dysfunction After Malignant Middle Cerebral Artery Infarction.


M Dialysis AB

M Dialysis AB is the leading company devoted to the development, manufacturing and marketing of the Microdialysis technique.

The head office is located in Stockholm, Sweden, with a subsidiary in Boston MA, USA. M Dialysis has distributors across the globe, responsible for local sales, service and support.

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Distributor
Microdialysis in Neurointensive Care

Microdialysis is a tool for in vivo sampling of soft tissues that utilizes the principle of diffusion through a semi-permeable membrane. The technology is minimally-invasive, easy to handle, and may be used continuously over a period of several days.

The method is performed by inserting a Microdialysis catheter into the tissue being studied. The Microdialysis membrane of the catheter is in direct contact with the soft tissue.

The catheter is perfused with a sterile isotonic solution via a small pump attached to its inlet lumen. In the tissue, substances from the interstitial fluid diffuse through the semi-permeable Microdialysis membrane into the perfusion fluid. This fluid, now known as dialysate, moves through the outlet lumen and into a collection microvial. Microvials are exchanged at regular intervals. The dialysate collected may be analyzed immediately using the ISCUS™ Microdialysis Analyzer as well as later in the laboratory using additional analytical techniques (if desired).

The metabolite values in the dialysate provide a picture of the local tissue metabolism. This has been particularly useful in neurointensive care as there are well described metabolic changes that occur with secondary ischemic events in the cases of traumatic brain injury (TBI) and subarachnoid hemorrhage (SAH).

Microdialysis sampling is carried out by placing the sterile CE-certified Microdialysis catheter in the brain parenchyma. All Brain Microdialysis Catheters have a gold thread in the tip so confirmation of placement can be made by CT.

70 Brain Microdialysis Catheter

- Free positioning and fixation by tunnelation
- Available in different shaft and membrane lengths

70 Bolt Microdialysis Catheter

- Access and fixation using a bolt system

71 High Cut-off Brain Microdialysis Catheter

- Free positioning and fixation by tunnelation
- High Cut-off membrane enables the diffusion of high molecular weight substances e.g. cytokines

106 and 107 Microdialysis Pump

The 106 and 107 Microdialysis Pumps are dedicated for the perfusion of Microdialysis catheters with sterile isotonic perfusion fluid. Both pumps are battery driven.

The 106 Microdialysis Pump operates at a fixed flow rate of 0.3 µl/min. The flow rate of the 107 Microdialysis Pump can be set stepwise between 0.1 and 5.0 µl/min.

The ISCUS™ Microdialysis Analyzer is specially designed to handle small sample volumes. It is a point of care analyzer for monitoring metabolic changes in tissues and organs during surgery, in intensive care and normal ward.

Biochemical markers:

Glucose
Lactate
Pyruvate
Glycerol
Glutamate
Urea

Secondary ischemia is a frequent and serious complication affecting patient outcome. Since Microdialysis allows continuous surveillance of cerebral metabolism in a clinical setting, secondary ischemia or mitochondrial dysfunction can be recognized at an early stage. Thus, the technique opens a window of opportunity for therapeutic interventions.