

From neurofundamentals to evidence-based medicine in neurorecovery after TBI

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TBI is a field with many unmet needs in medicine and public health. Brain injury is a major cause of death and disability also leading to huge direct and indirect costs to society, as its incidence continues to increase. TBI populations are heterogeneous in terms of mechanism of disease, baseline prognostic risk factors, clinical severity and evolution.

A novel pharmacological approach, together with more basic and clinical research are clearly needed to improve TBI treatment and therapeutic tailoring, in order to meet individual patient needs. The primary goal of pharmacological support in TBI is to reduce secondary damage (neuroprotection) and to enhance repair (neurorecovery).

Multimodal agents are superior options to address traumatic brain injury, as compared to monomodal or pleiotropic interventions that are focused on neuroprotection. The key feature of multimodal interventions, such as Cerebrolysin, is the ability to mirror endogenously activated responses to promote sustainable neurorecovery, by enhancing and not hindering neurotrophicity, neuroplasticity and neurogenesis.

Furthermore, the previously described heterogeneity of TBI generates complex challenges from a therapeutic perspective, since the multidimensional nature of TBI outcome cannot be captured using conventional methods (single, dichotomized scales).

CAPTAIN I and II were randomized double-blind, placebo-controlled trials that enrolled patients with moderate to severe TBI, using a multidimensional outcome ensemble. Both trials results reveal high assay sensitivity of the multidimensional approach, indicating benefits of Cerebrolysin at Day 30 and 90 intention-to-treat populations. The baseline prognostic risk score shows excellent comparability between treatment groups (median = 2.0; MW = 0.4883). A meta-analysis of the trials showed statistical significance superiority of Cerebrolysin at 30 and 90 days after TBI.

The CAPTAIN trial series and meta-analysis demonstrate the efficacy and safety of Cerebrolysin for moderate to severe TBI recovery and confirm the agent's excellent safety profile.