

Intermediate glucose control may be better than tight in neurocritical care patients

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A new study in BioMed Central's open access journal *Critical Care* suggests that intensive glycemic control does not reduce mortality in neurocritical care patients and could, in fact, lead to more neurological damage. Complicating the picture, poor glucose control also leads to worse recovery and should be avoided. This study suggests that a strategy to maintain intermediate glucose levels would contribute to better outcomes in these patients.

Hyperglycemia and hypoglycemia are common in critically ill patients and are strongly associated with worse outcomes. This is particularly important for neurologically ill patients, for whom poor glycemic control could contribute to secondary neurological damage. Hyperglycemia is known to be very harmful in such patients, potentially leading to further brain damage and increased mortality.

On the other hand, hypoglycemia could cause neuroglycopenia – a shortage of glucose in the brain – which can lead to loss of consciousness, brain damage and, in some cases, even death. For these reasons, the same optimal glycemic targets for general critical care patients may not apply for neurologically injured patients.

Numerous randomized controlled trials (RCTs) have assessed the efficacy and safety of intensive insulin therapy and tight glycemic control regimens for critically ill patients, though these largely focus on mortality as the primary outcome, rather than functional recovery, which would be a more meaningful endpoint for neurological patients.

With the aim of determining better glycemic targets for neurologically injured patients, a research group from the Department of [Critical Care Medicine](#) at the University of Calgary, Canada, performed a systematic review and meta-analysis of RCTs comparing intensive insulin therapy to conventional glycemic control, among patients with neurological injuries, including [traumatic brain](#)

[injury](#), ischemic or [hemorrhagic stroke](#), anoxic encephalopathy, central nervous system infection or spinal cord injury.

Sixteen RCTs, a combined total of 1,248 neurocritical care patients, were included. In the trials, glycemic control targets with intensive insulin ranged from 70-140 mg/dl, while conventional protocols aimed to keep [glucose levels](#) below 144-300 mg/dl.

Consistent with the results of recent large multicenter RCTs in non-neurological patients, the authors found that intensive glucose control did not reduce mortality among their neurocritical care patients, but it did reduce the occurrence of poor neurological outcomes. However, intensive insulin therapy significantly increases the risk of hypoglycemia. A benefit was not observed when intensive treatment was compared with more intermediate glycemic targets of 110-180mg/dl.

According to lead author Andreas Kramer, "Tight glucose control doesn't appear to improve mortality in neurocritical care patients." He continued, "Very loose [glucose control](#) is associated with worse neurological recovery and should be avoided. Our results support targeting more intermediate glycemic goals."

More information: Optimal glycemic control in neurocritical care patients: a systematic review and meta-analysis Andreas H Kramer, Derek J Roberts and David A Zygun *Critical Care* (in press)

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