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New Hope in the Battle against Hypoglycemia

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For patients with diabetes, their family members and friends, nothing is more frightening than a hypoglycemic or low blood sugar episode. After the episode, many patients feel like they've been "hit by a freight train". Even though clinicians work closely with patients to reduce or eliminate these episodes, occasionally a severe hypoglycemic reaction can occur. Fortunately, thanks to researchers at the UC San Francisco VA Medical Center, a possible therapy may help prevent brain impairment caused by severe hypoglycemia.

In the May issue of the journal, *Diabetes*, Raymond Swanson, MD and Sang Won Suh, PhD, reported that a natural, non-toxic byproduct of glucose, called "*pyruvate*" can prevent brain cell death and cognitive impairment that can follow an episode of severely low blood sugar. In their research with animals, pyruvate was administered along with glucose after 30 minutes of diabetic coma. The therapy helped to prevent brain damage, as well as subsequent memory and learning impairment far better than treatment with glucose alone.

Previously, Swanson and Suh reported that hypoglycemia triggers the activation of an enzyme called PARP-1, which in turn prevents neurons from metabolizing glucose into pyruvate. Deprived of pyruvate, neurons will starve and die. The researchers discovered they could circumvent the action of PARP-1 and keep neurons alive by administering pyruvate directly.

In their most recent study, animals receiving pyruvate had 70 to 90 percent less neuronal death than animals who received only glucose following severe hypoglycemia. The protective effects of pyruvate were greatest within one to two hours of the onset of hypoglycemia.

In the near future, Dr. Swanson plans to study animals experiencing more moderate hypoglycemia -- a condition more commonly experienced by patients with diabetes. He also hopes to advance his research towards human clinical trials. Swanson notes, "Since pyruvate is a natural metabolite present in our blood, there's no reason to think that it would have any long-term adverse effects."

For more information about this exciting research involving hypoglycemia, visit http://pub.ucsf.edu/newsservices/releases/200504215/ [1].

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