

Study finds high-dose HBO2 therapy extends survival window after cardiopulmonary arrest

July 15 2008

A ground-breaking study by researchers at the School of Medicine at LSU Health Sciences Center New Orleans published in the August 2008 issue of *Resuscitation* has major implications for the #1 cause of death of Americans -- sudden cardiac arrest.

The researchers stopped the heart of laboratory swine kept at room temperature, declared them dead from cardiac arrest, waited 25 minutes, and then resuscitated them with high doses of oxygen using hyperbaric oxygen therapy. The American Heart Association statistics on sudden death have shown that if a patient's heart is not restarted within 16 minutes with CPR, medications, and electric shocks, 100% of patients die.

"To resuscitate any living organism after 25 minutes of heart stoppage at room temperature has never been reported and suggests that the time to successful resuscitation in humans may be extended beyond the stubborn figure of 16 minutes that has stood for 50 years," notes Dr. Keith Van Meter, Clinical Professor of Medicine and Chief of the Section of Emergency Medicine at LSU Health Sciences Center New Orleans, who led the study.

The study involved the use of three groups of laboratory swine. All swine underwent cardiac arrest for 25 minutes during which time they received no artificial breathing, CPR, medications, or electric shocks.

After 25 minutes the swine were randomly divided into 3 groups. The first group remained at normal pressure. The second group was given standard-dose hyperbaric oxygen, and the third group was given high-dose hyperbaric oxygen, a dose that is nearly 1/3 more than the highest dose currently given to humans. Advanced cardiac life support (ACLS) was started on animals in all groups for a two-hour resuscitation period. After the two-hour resuscitation period, four of the six animals in the high-dose hyperbaric oxygen group could be resuscitated. None of the subjects in the other groups were able to be resuscitated.

"The present study shows that short-term high-dose hyperbaric oxygen is an effective resuscitation tool and is safe in a small multiplace hyperbaric chamber," concludes Dr. Van Meter. "A rehearsed team can easily load a patient in cardiopulmonary arrest into a small multiplace chamber in the pre-hospital or hospital setting without interrupting CPR or advanced cardiac life support. Successful resuscitation at 25 minutes suggests that if high dose hyperbaric oxygen is used at the current ACLS limit of 16 minutes, a greater survival may be achieved in humans and allow application of more definitive treatment such as clot dissolving drugs."

The research team also included LSU Health Sciences Center New Orleans faculty Diana Barratt, MD, MPH, Heather Murphy-Lavoie, MD, Paul G. Harch, MD, James Moises, MD, and Nicolas Bazan, MD, PhD. and

Future studies are planned to further refine knowledge about this important addition to resuscitation and survival procedures.

Source: Louisiana State University Health Science Center

Citation: Study finds high-dose HBO2 therapy extends survival window after cardiopulmonary arrest (2008, July 15) retrieved 23 April 2024 from <https://medicalxpress.com/news/2008-07-high-dose-hbo2-therapy-survival-window.html>

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