Current clinical guidelines suggest augmenting the mean arterial pressure (MAP) of acute spinal cord injury (SCI) patients to deliver more blood to the spinal cord and preserve neurologic function. However, it is difficult for clinicians to manage MAP without real-time physiological information on the effect of MAP alterations on spinal cord hemodynamics, blood flow. To address this, we have developed a non-invasive optical sensor based on near-infrared spectroscopy (NIRS). This well-established technology involves transmitting near-infrared light and then converting light absorption measurements into physiologic parameters of interest. In this study, we are investigating the feasibility and sensitivity of using NIRS as a spinal cord oxygenation and hemodynamics monitoring device by implanting a custom NIRS sensor into Yucatan pigs over a period of seven days after SCI. To validate the NIRS measurements, invasive intraparenchymal (IP) probes measuring oxygenation, blood flow, and tissue pressure are inserted into the spinal cord. Over the course of the experiment, a series of changes in oxygen saturation and MAP are simulated to compare the measurements of the NIRS and IP sensors. So far, the effect of these simulations has been detected by both NIRS and IP methods, demonstrating that our novel NIRS sensor can monitor changes in oxygenation and hemodynamics within the spinal cord. The NIRS sensor has been very sensitive in capturing responses to MAP changes. With further development, the NIRS sensor could become a clinically relevant device used by spine surgeons to monitor spinal cord hemodynamics and improve clinical MAP management.

Themes:

Check (highlight) the most applicable theme according to the abstract.

| X Innovation and Technology | Health and Wellness | Culture and Society | Sustainability and Conservation |

Comments:

This is an interesting abstract. Clearly described.

How many simulations occurred? Results are vague but understand wording limitations- when say very sensitive what does this mean- was sensitivity calculated or did it just show changes occurring?