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# Pregnancy hormone has unprecedented, powerful effect on spinal muscular atrophy

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Researchers in Ottawa report new hope for the treatment of infants born with serious genetic disorder.

Over 1000 children in Canada are affected with Spinal Muscular Atrophy (SMA), a genetic disorder that causes muscle weakness and loss of motor control. In its most severe form survival of children with SMA beyond 5 years is rare. Although the disorder is caused by the loss of a specific gene, all infants and children with SMA have an untouched highly similar gene within their genetic make up. Activation of this copy gene has the potential to treat SMA, and thus has been a goal of researchers around the world. Now, researchers at the Children's Hospital of Eastern Ontario Research Institute in Ottawa report the strongest such activation yet observed with attendant benefit on mice genetically engineered to have SMA.

PhD student Faraz Farooq working in the laboratory of University of Ottawa professor, Alex MacKenzie has discovered that the pregnancy hormone Prolactin, a Canadian discovery in itself, not only activates the copy gene but if given over time extends the lifespan of SMA mice by up to 60%. The research report is published today in the *Journal of Clinical Investigation*.

"Prolactin causes a dramatic regulation of copy gene SMN2 which results in high production of SMN protein, resulting in the extension in the lifespan of mice with SMA," said Mr. Faraz Farooq. "Labs around the world have been trying to produce more protein from copy gene

SMN2 but with Prolactin (an insulin like protein) we're seeing up-regulation that's more than tenfold. It's the biggest increase anyone has yet seen in the SMA Field with any potential therapeutic compound. This represents a significant advance in search for a therapy for this disease."

The laboratory testing of Prolactin on SMA not only shows an extended lifespan but also improved motor control. Prolactin has been used in clinical trials for unrelated studies, so it is expected that the path between pre-clinical validation and actual clinic trials of Prolactin with SMA patients will be reasonably short.

"News of prolactin's role and effectiveness in SMN regulation breathes fresh hope into all of the SMA community," said Martha Slay, president and co-founder of FightSMA. "FightSMA congratulates Dr. MacKenzie and his colleagues on this exciting breakthrough in SMA research."

"We believe we're moving in the direction of an effective pre-symptomatic treatment of kids with SMA," said Dr. Alex MacKenzie, principal investigator, CHEO Research Institute. "We want to somehow stop the progress of this disorder in its tracks, and let our tiniest patients build strength. Today's findings are not curative, but we think this is a breakthrough discovery. Hopefully by using different approaches to increase SMN protein we can develop a combination therapy for the treatment of SMA."

**More information:** Prolactin increases SMN expression and survival in a mouse model of severe spinal muscular atrophy via the STAT5 pathway www.jci.org/articles/view/4627 … 94a2a5d125f99c52847c

Provided by Children's Hospital of Eastern Ontario Research Institute