Premature babies' low blood pressure puzzle explained

February 13 2018

New information revealed by University of Aberdeen study could help inform treatment of premature babies. Credit: University of Aberdeen

Scientists have discovered crucial new information about how a foetus develops which could explain why very premature babies suffer low blood pressure and other health problems.

It is well-known that babies born before 32 weeks of pregnancy often suffer from dehydration, a drop in blood pressure and even death in some cases.

The team found that even at 20 weeks of pregnancy babies in the womb do not yet create a vital hormone called aldosterone, which likely explains some of the risks facing premature babies.

The findings will help inform the understanding and treatment of premature babies.

The study by scientists from the universities of Aberdeen, Glasgow, British Columbia and Queen Mary University of London was funded mainly by the UK Medical Research Council and has been published in *BMC Medicine*.

Aldosterone is a hormone vital for controlling blood pressure and is created by the adrenal glands. If a baby does not have enough aldosterone then too much salt is lost in its urine—called 'salt wasting'. It is this salt wasting that can cause some of the severe problems seen in very premature babies with one in three experiencing the condition to some degree within their first week after birth.

This study showed that while a foetus's adrenal glands are active throughout the second trimester of pregnancy, they do not yet make aldosterone. As such, babies born before 32 weeks do not have fully functioning adrenal glands and so they are at risk of salt wasting.

"There are still many things we do not fully understand about how the foetus develops in the womb," explains Professor Paul Fowler, Director of the Institute of Medical Sciences at the University of Aberdeen. "This study helps shed new light on the development of this crucial gland and its potential impact on a prematurely born baby."

Zoe Johnston, a Ph.D. student at the University of Glasgow and first author of the project, adds: "This study identifies important information required for the detection and treatment of salt-wasting disorders in very

premature babies. It is striking that the baby's kidneys can detect aldosterone and so rely on their mother's adrenal glands until their own are fully functional."

Dr. Stephen Meader, Programme Manager for Reproductive Health at the MRC, says: "Better understanding of why premature babies end up with certain health problems lays the groundwork to finding solutions.

"When babies aren't carried to full term, it is a stressful experience for the entire family, and could come with lingering health concerns. This research could play a role in helping the scientific community improve health outcomes for premature babies."

More information: Zoe C. Johnston et al. The human fetal adrenal produces cortisol but no detectable aldosterone throughout the second trimester, *BMC Medicine* (2018). DOI: 10.1186/s12916-018-1009-7

Provided by University of Aberdeen