

THE PARTICIPATION OF THE FETUS DURING CHILDBIRTH

Until recently, scientists thought that the fetus played no active role in its own birth process. Evidence now indicates, however, that the fetus triggers the release of “stress” hormones during parturition that help it survive the arduous process of birth and adjust to life outside the mother’s uterus.

In addition to the pressure the fetus feels while passing through the birth canal, it is also periodically deprived of oxygen when powerful uterine contractions compress the umbilical cord and placenta. During these periods of stress, the fetus produces very high levels of epinephrine and norepinephrine, both of which are classified as catecholamines. Catecholamines generally help a person react favorably to incidents of extreme stress. Catecholamine secretions allow the fetus to counteract the periods of low oxygen and other potentially harmful situations throughout most of parturition.

These stress situations are beneficial because the unusually high levels of catecholamines also permit the newborn to adjust to new conditions outside the mother’s uterus immediately after birth. Postnatal adjustments include breathing, breaking down fat and glycogen into usable fuel for cells, accelerating the heart rate and cardiac output, and increasing blood flow to the brain, heart, and skeletal muscles.

The surge of catecholamines during parturition also causes the newborn’s pupils to dilate, even when strong light is present. This alertness may help the infant form an early bond with its mother.

The production of fetal catecholamines is a direct result of the adrenal glands’ response to stress. In adults, however, catecholamine secretions begin with the stimulation of the sympathetic nervous system. It is also of interest that the adrenal glands of the fetus are proportionately larger than those of the adult.