

From foetus to the newborn: what triggers the first breath?

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Abstract

Human birth is set by the transition from foetus to the newborn, through the passage from intrauterine condition to extrauterine environment. However, first breath is still considered the starting point of life, even if there are evidence of several physiological events occurring before breathing. Indeed, developmental neuroscience research has still not discovered all dynamics of human birth. That which triggers the first breath is not understood, nor has brain modification/activation at birth been clarified. First breath occurs around 20 seconds after birth. Before breathing, newborn is motionless and her/his heart rate decreases, in contrast with the previous foetal motory activity and elevated heart rate, which are regularly observed and measured into the intrauterine condition. During this very short time of newborn's silence and immobility, a complex sequence of physiological events takes place, which then determine the muscle activity associated with the influx of air into the lung and the settling of a spontaneous and continuous respiration. Before breathing, Central Nervous System (CNS) should give its immediate response to the new environment, being involved in this sequence of events and in the dramatic changes which characterize the passage from foetus to the newborn. In this work we will consider the physiological events that occur at human birth before respiratory activity and wailing, highlighting the role of CNS and its interaction with the new extrauterine surrounding, in order to identify a putative neurobiological mechanism which triggers the first breath.

Biography

Daniela Polese, is an expert on Psychiatry and Neuroscience, focusing on Developmental neuroscience and Human birth physiology. She is studying the brain modification at birth and during the early infancy in response to environment, in the context of the PhD Program on Sensorineural Plasticity at Sant'Andrea University Hospital, University Sapienza of Rome, Italy. She has been professor on contract on Sexology and clinical psychology of the life cycle at the Residency Program on Obstetrics and Gynecology, and professor on contract on Dual Diagnosis at the Residency Program on Psychiatry, at the University of Naples Federico II, in Italy. She has collaborated for the chair of Developmental Psychopathology at the Faculty of Psychology at the University of Chieti-Pescara G. D'Annunzio, Italy. She is author and curator of several publications on psychosis, depression, and on pregnancy and birth. She graduated in painting from the Academy of Fine Arts in Rome, Italy.

Global Experts Meet on Gynecology and Obstetrics Care, Webinar | 21st February, 2022

Citation: Daniela Polese, *From foetus to the newborn: what triggers the first breath?*, World Gynecology 2022, Global Experts Meet on Gynecology and Obstetrics Care, Webinar, February 21, 2022, 2327- 4360