PHYSIOLOGICAL AND PATHOLOGICAL VARIABILITY IN UTERINE ELECTRICAL ACTIVITY: A CHALLENGE TO BE FACED TO FOR THE DIAGNOSIS OF PRETERM LABOR.

C. Marque, J. Terrien*, S. Rihana*, M. Khalil***

*Biomécanique et Génie Biomédical, UMR CNRS 6600, Université de Technologie de Compiègne, France
** Signaux et systèmes, Université Libanaise, Faculté de Génie 1, Tripoli, Liban

Abstract

Many attempt have been done to record and process the uterine abdominal electrical activity in order to detect preterm labor threat. This signal is subject to many sources of variability, leading thus to a complex extraction of the information of interest for diagnosis purpose. The first source of variability, observed at either recording level (cellular, organ or abdominal) is of physiological origin: normal evolution along term of temporal and spectral characteristics, circadian rhythm, interindividual variability… The second source is related to the recording protocol: skin and tissue impedance, position of the electrodes, placental influence… These two sources of variability are inherent either to the signal or to the recording device. The last source of variability is the one of interest for clinical purpose. Indeed, for a given pregnancy term, the variability related to a pathological state of the contractile uterus has to be evidenced for the diagnosis of preterm labor. We will present in this paper the effect of these variability sources on the characteristics of the electrical activity of the uterus. We will also illustrate and propose some solutions in order to enhance the information related to pathological variability and to decrease the other effects.

Keywords: uterine electrical activity, electrohysterogram, pregnancy monitoring, preterm labor, variability