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PARTIAL DIRECTED COHERENCE OF CARDIOTOCOGRAPHIC SIGNALS FOR ANALYSIS OF PRETERM BIRTH RISK

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Abstract

Traditional methods of fetal monitoring are used mainly during labor, leaving the only course of action – the caesarean intervention – in cases with high risk of fetal distress. We used another approach and set up a database that consists of cardiotocographic (CTG) recordings acquired ante partum during the 25th-28th week of pregnancy, by means of a Monica Healthcare AN24 fetal monitoring system. The analyzed signals are the maternal heart rate (MHR), the fetal heart rate (FHR) and the maternal uterine contractions (UC). The database is divided into two groups based on the risk of preterm labor: the control group that consists of 64 normal recordings and the study group that has 48 pathological or suspicious recordings. The analyzing method implemented is the Partial Directed Coherence (PDC) that determines the degree of correlation and the dynamic of couplings between corresponding signals. The purpose of the analysis is to identify the differences between the two groups and correlation degree for the specified signals in pathological or suspicious cases.

Key words: cardiotocography, fetal heart rate, maternal heart rate, partial directed coherence, uterine contractions

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