

The detection of the incidents of simultaneous cardiac and respiratory deceleration, and apnoea in preterm infants is often based on simple threshold techniques, which suffer from poor specificity and are prone to artefacts. Three methods for the automatic detection of such incidents were designed, tested and evaluated from the time series of Heart Rate (HR), Respiratory Rate (RR) and Oxygen Saturation (SpO₂) collected from 54 neonates (approximately 2426 hours of recording). They were the cumulative sum method with shared entropy, the correlation method and the derivative method. The latter method had the highest performance (100% sensitivity, 96.19% specificity and 96.79% accuracy). Though not optimised to work in real time, this method has the potential in forming the basis of a system for detecting incidents of cardiac and respiratory deceleration, and apnoea.