Cerebral autoregulation (CA) is a control mechanism maintaining a relatively constant cerebral blood flow (CBF) despite changes in arterial blood pressure (ABP). Correlation based methods are a common approach to the CA monitoring. In this paper, we analyse the influence of signal pre-processing on a time lag tau of ABP-CBF cross-correlation function (CCF) and a mean index (Mx) based on Pearson's correlation. Effects of moving window length, sampling frequency and frequency band were analyzed. We increased robustness of both parameters by 25 – 60%. We suggest using homogeneous settings for pre-processing to allow reliable comparison of clinical studies from different research groups.