Dexmedetomidine appears to have an effect on the cortical activity of neonates

Dexmedetomidine is a sedative that has been proven to be effective and safe to use with adults. Its sedative effects are often desirable as it induces an anesthesia resembling deep sleep. Although it has been used in sedation with newborns as well, how it affects the activity of their brain remains unclear.

To shed light on this topic, Samuli Suvisto studied eight hours long electroencephalographic (EEG) recordings of 21 newborns. Dexmedetomidine was found to affect several measures of correlation and synchrony between EEG signals that originated from different locations of the brain. Furthermore, it was indicated that for future studies, hour long recordings of EEG would not be needed. This is due to all the effects being found within the following ten minutes after the subjects had received the drug.

In EEG analysis, the focus is commonly in the main components of EEG: amplitude, frequency and phase. With the help of computational features, changes in these components can readily be analyzed. Computational features in essence are a way of representing and quantifying the signal in ways so that information can be extracted that might not otherwise be possible to be seen or analysed visually. In addition to the previously mentioned components, measures to quantify the spectral properties as well as multifractality of the signal were utilized to study the effects of dexmedetomidine.

As is common practise with drug studies, the effects were studied by comparing the postdrug recordings to the predrug ones. Although EEG has a limited resolution for differentiating between different locations, its ability to measure changes in respect to time make it a powerful tool in studying drug effects. Samuli’s novel research was carried out in BABA (Baby Brain Activity) Center located at the Helsinki Children’s Hospital with the help of a medical doctor.

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