**Aim:** To develop an algorithm for automated analysis of the EEG background activity of the continuous EEG from day one to three.

Method: 42 healthy infants with GA< 31 wk were included, monitored (NicoletOne monitor) continuously for 3 days soon after birth. 8 EEG electrodes were applied. The data were analyzed by visually removing artifacts (pruned), and by an algorithm removing the highest 5, 10, 15 or 20% of the total absolute bandpower (tABP).

Results are depicted in fig 1. (δ-tABP)
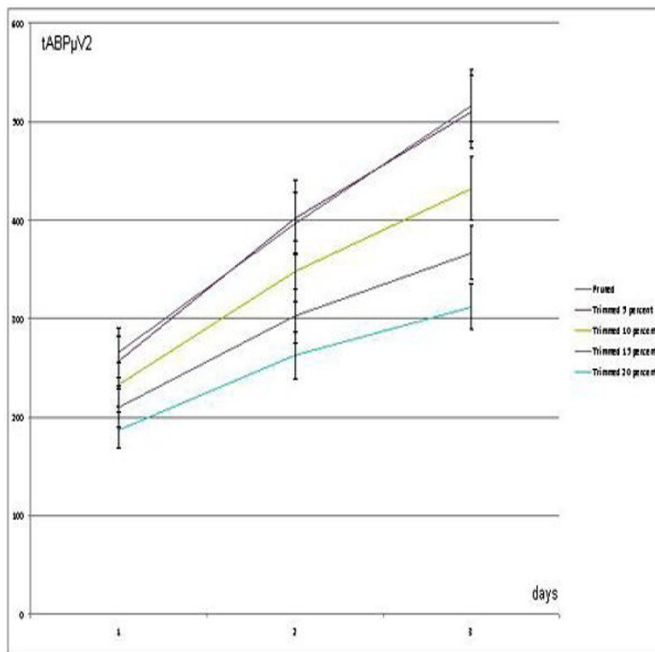
[fig.1]

There were good correlations between the pruned and the 4 different algorithms used, the 5% removal showing the closest relationship with 95 % match of the removed data.

Conclusion: This study shows a good relationship between pruned and automated analyses of the EEG recording.

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EFFECT OF CARBON DIOXIDE ON BACKGROUND CEREBRAL ELECTRICAL ACTIVITY IN PRETERM INFANTS DURING THE FIRST 4 WEEKS AFTER BIRTH

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Background: Hypocarbia causes slowing of background cerebral electrical activity while hypercarbia causes prolonged interburst intervals in very low birth weight babies during the first three days after birth[1].

Aim: This study aims to determine whether changes in blood gases were associated with changes in background cerebral electrical activity in preterm infants during the first four weeks after birth.

Methods: An observational study is being conducted at the Newborn Intensive Care Unit, St Mary's Hospital, Manchester. 75 minute electroencephalography (EEG) recordings were performed every week for 4 weeks in babies born before 32 weeks gestational age. Capillary blood gases were measured midway during each EEG recording. EEG was analysed by manual calculation of interburst interval. pH, pCO_2, base deficit and bicarbonate were entered as variables in a stepwise linear regression model.

Results: 39 EEG recordings have been performed on 13 babies. The corrected gestational age at the time of EEG recording ranged from 24 - 34 weeks. The median (range) of blood gas measurements were: pH: 7.3 (7.18 - 7.43); partial pressure of carbon dioxide (pCO_2): 6.68 kPa (5.06 - 10.2); Base deficit: 1.5 (8.9 to -10.7); Bicarbonate: 22.15 mmol/L (16.7 - 33.1). Corrected gestational age was related to duration of interburst interval (r = 0.699; p< 0.001). In a linear regression model, corrected gestational age and pCO_2 was related to duration of interburst interval (r = 0.769; p< 0.001).

Conclusion: There is suppression of EEG at higher levels of pCO_2.

References: (1) Victor S et al. Pediatr Res 2005 Sep;58(3):579-85.