PublisherInfo		
PublisherName	:	BioMed Central
PublisherLocation	:	London
PublisherImprintName	:	BioMed Central

Comparison of five sedation scoring systems by means of auditory evoked potentials

ArticleInfo		
ArticleID	:	4078
ArticleDOI	:	10.1186/ccf-1999-121
ArticleCitationID	:	121
ArticleSequenceNumber	:	15
ArticleCategory	:	Paper Report
ArticleFirstPage	:	1
ArticleLastPage	:	4
ArticleHistory	:	RegistrationDate : 1999–5–7 OnlineDate : 1999–5–7
ArticleCopyright	:	Current Science Ltd1999
ArticleGrants	:	
ArticleContext	:	130541111

Richard Venn

Keywords

Evoked potentials, intensive care therapy, monitoring of sedation, sedation, sedation score

Comments

The drawbacks of AERs are that they require training and experience, and the effects of repeated auditory stimuli on a critically ill patient are unknown. The newer bispectral index monitor may be more useful in the ICU setting since it is simple to use by all staff and requires no auditory input. Alternatively in the absence of these expensive monitoring systems, oversedation may be avoided by switching off sedation at regular periods and not restarting infusions until the patient reaches a lesser sedation score.

Introduction

Auditory evoked responses (AEP) have been used as a means of monitoring awareness during anaesthesia. Attention has focused on the latency of the early cortical response N_b which indicates light anaesthesia and potential awareness when decreased to less than 44.5 ms. On the intensive care unit (ICU) sedation and analgesia is necessary to prevent ventilator dysynchrony and allow unpleasant procedures to take place. Sedation scoring systems are usually used to assess the level of sedation but unfortunately they are subjective and poor indicators of oversedation.

Aims

The authors have compared an objective measure (AER) with various subjective scoring systems.

Methods

The study investigated 95 consecutive patients requiring sedation for ventilation on the ICU. Midazolam and fentanyl were given for sedation and analgesia respectively, but additional agents could

be used if sedation proved inadequate (propofol, methohexitone, gamma-hydroxybutyrate, ketamine or clonidine). The AER (midlatency $N_b$peak) and corresponding level of sedation was recorded using five scoring systems [Ramsay, Cohen, Cambridge, Bloomsbury and Newcastle (Cook) Sedation Scores]. Kendall's correlation coefficients were calculated and regression analysis performed.

Results

The authors carried out 190 measurements in the 95 patients. Patients with higher APACHE II scores were more likely to be deeply sedated since, for example, severe acute respiratory distress syndrome (ARDS) patients required greater sedation to prevent ventilator dysynchrony and impaired gas exchange.The Ramsay score revealed the best correlation with changes in N_b latency (see table)

Table

Scoring system	Kendall's coefficient	Coefficient of determination(r^2)	*P*
Ramsay	0.71	0.68	<0.05
Cohen	-0.62	0.56	<0.05
Cambridge	0.68	0.61	<0.05
Bloomsbury	-0.62	0.57	<0.05
Newcastle	-0.64	0.59	<0.05

However scatterplots showed a large variation of N_b latencies with deeper levels of sedation; ie these scoring systems are poor discriminators at deeper sedation levels.

Discussion

Derived electrophysiological measurements and evoked potentials have all been used to measure depth of sedation/anaesthesia but require training and experience to develop competency. However, since clinical scoring systems are poor discriminators at deeper sedation levels, the authors suggest that AERs may have a role where deeper levels of sedation are required for prolonged periods. It is postulated that the Ramsay score showed the best correlation since it includes a primitive reflex (glabellar tap) to discriminate asleep states.

References

1. Schulte-Tamburen AM, Scheier J, Briegel J, Schwender D, Peter K: Comparison of five sedation scoring systems by means of auditory evoked potentials. Intensive Care Med. 1999, 25: 377-382.