Poster Presentations — B13

Sedation Scores in Target Controlled Infusions of Remifentanil and Dexmedetomidine
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Background: Dexmedetomidine (DEX) is an alpha-2 adrenoceptor agonist which has been given by
infusion for sedation. Different methods have been used to assess the level of sedation. A significant
difference was found between low/moderate dose and placebo1 and at high dose infusion.2 Remifentanil
(REMI) is a potent analgesic with sedative side-effect. We sought to establish which sedation scale would
 correlate with a stepwise increase in DEX and REMI.

Method: With IRB approval and informed consent, five consenting healthy adult male volunteers aged 22-
29 years old were infused via a computer-controlled infusion device sequential infusions of REMI and
DEX to target plasma concentrations of 1/2/3/4 ng.ml⁻¹ and 0.6/1.2/1.8/2.4 ng.ml⁻¹ respectively. Target
concentration was assumed to be reached following a 5 minute wash-in period and then maintained for 35
minutes. Sedation was assessed independently at each dose level by two observers using the Observer’s
Assessment of Alertness/Sedation (OAA/S) scale (composite and sum) and the Ramsey sedation score. A
visual analogue scale of sedation (VAS_sedation) was then completed by the patient. A vertical mark was
placed across a 100mm line with the endpoints “very awake” (=0) and “very sedated” (=100).

Results: For both drugs the four sedation scores at baseline and the four target concentrations were
recorded. Values were recorded throughout the range of each sedation scale: Ramsey (1-6); OAA/S
Composite (1-5); OAA/S Sum (9-20) and VAS_sedation 0-100. The correlation between sedation score and
target drug concentration was calculated. For REMI the R2 values were: VAS_sedation 0.8; OAA/S
Composite 0.06; OAA/S Sum 0.09, and Ramsey 0.004. For DEX the R2 values were: VAS_sedation 0.34;
OAA/S Composite 0.30; OAA/S Sum 0.43, and Ramsey 0.54. The mean VAS_sedation at baseline and
intervals were 9/31/58/80/85 for REMI, and 7/49/60/75/100 for DEX. Ramsey score of 6 and OAA/S
Composite score 1 was recorded in 3/5 subjects, who were receiving DEX 1.8 or 2.4 ng.ml⁻¹.

Conclusion: Five healthy males received intravenous infusions of REMI up to 4 ng.ml⁻¹ and DEX up to 2.4
ng.ml⁻¹. The presence of variable levels of sedation was demonstrated by the presence of scores
throughout the range of each scale. In this population, the only sedation score that showed correlation of
increasing sedation level with increasing plasma concentration was the self-rated VAS_sedation in the REMI
group. The other scales did not show a correlation for either of the study drugs. At the lowest
concentration of DEX (0.6 ng.ml⁻¹) there was evidence of marked sedation (VAS_sedation 49) and further
doses increased the sedation to a level approaching general anesthesia (VAS_sedation 100). The VAS_sedation
was unable to differentiate the level of sedation within the range of 0.6-2.4 ng.ml⁻¹.

References:

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