**Title:The response of bispectral index to laryngoscopy, comparison between healthy hemispheres during pseudo-steady state propofol and remifentanil anesthesia.**


**Introduction:**
We observed whether clinically relevant asymmetric responses occur on bilateral BIS measurements after laryngoscopy in healthy adults during propofol and remifentanil anesthesia. We hypothesized that high or low dose of remifentanil may affect the interhemispheric difference.

**Methods and materials:**
After ethics committee approval and patients informed consent, 40 cervical and lumbar hernia patients were included. We measured bilateral BIS(VISTA-XP4 with BIS-quarto™ sensor)(Covidien, Dublin, Ireland). Effect-site titration of remifentanil($Ce_{REMI}$) (Minto Model) and propofol($Ce_{PROP}$) (Schnider model) was administered. All data was captured by RUGLOOPII(Demed, Temse, Belgium). $Ce_{REMI}$ was started in high(5ng/ml) or low(3ng/ml) dose until steady state. $Ce_{PROP}$ was started at 2µg/ml and increased stepwise(0.5µg/ml/step) until loss of consciousness(LOC), defined as a transition from level 3 to 2 on the Modified Observers Assessment of Alertness and Sedation scale. After an equilibration delay, laryngoscopy was performed and a blinded BIS response was measured for 3 minutes. Interhemispheric differences in BIS larger than 10% are clinically relevant.

**Results:**
No demographic differences were present between high and low $Ce_{REMI}$ groups, except for age(Table 1). Time to LOC and BIS at LOC was not statistically different between groups(Table 2). $Ce_{PROP}$ at laryngoscopy was 3.4+/-0.7 and 3.7+/-0.9(Mean +/-SD) for respectively the low and high CeREMI group. Regardless of CeREMI, we could not observe interhemispheric BIS responses larger than 10%.


**Table 1:**

| Demographics | Age (years+/-SD) | Weight (kg+/-SD) | Height (cm+/-SD) | Time to LOC (sec+/-SD) |
|---|---|---|---|---|
| 3CeREMI group | 50 +/- 11 * | 74 +/- 16 | 170 +/- 9 | 598 +/- 124 |
| 5CeREMI group | 43 +/- 9 * | 77 +/- 14 | 173 +/- 10 | 609 +/- 170 |

*** p<0.05**

**Table 2:**

| | BIS at LOC | Median BIS one minute before laryngoscopy (baseline) | Median BIS one minute after laryngoscopy | Delta BIS = BIS response |
|---|---|---|---|---|
| **Left hemisphere** | | | | |
| 3 CeREMI group | 68 +/- 10 | 57 +/- 9 | 59 +/- 10 | 2 +/- 5 |
| 5 CeREMI group | 73 +/- 8 | 57 +/- 9 | 56 +/- 9 | -1 +/- 5 |
| **Right hemisphere** | | | | |
| 3 CeREMI group | 69 +/- 9 | 56 +/- 10 | 60 +/- 10 | 3 +/-6 |
| 5 CeREMI group | 73 +/- 10 | 57 +/- 10 | 56 +/- 9 | -1 +/-5 |


**Conclusion:**
Bilateral BIS measurements may only provide clinical relevant information in diseased brains, as the normal population does not seem to suffer from large interhemispheric differences in BIS behavior.