THE USE OF BISPECTRAL INDEX IN CARDIAC ANESTHESIA

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Abstract:
Anesthesiologists titrate doses of anesthetic drugs based on the haemodynamic responses to noxious stimulation – which may not necessarily mean awareness, nor does a lack of any haemodynamic change guarantee unconsciousness. This approach might be feasible in normal healthy individuals but does not guarantee safety in patients with compromised cardiopulmonary systems. Ideally, the safe approach would be to titrate drugs according to their presumed effect-site concentrations or any measure that reflects this effect. In clinical practice, it would be easier to rely upon a monitor that reflects effect-site changes produced by drugs rather than on complex mathematical exponentials involved in calculating effect-site concentrations. Differences in drug sensitivity between individuals can also occur despite identical effect-site concentrations. This can be caused by different receptor sub-types. This is one of the reasons why a monitor of anesthetic depth, e.g. the BIS monitor, may improve anesthesia. Thus, effect-site concentrations may not necessarily be a reliable measure of drug effect.

The BIS has been demonstrated to be safe and efficient as a pharmacodynamic measure of the central effects of anesthetics during short surgical procedures. It is desirable to ascertain how the index performs during long surgical procedures, where there will be changes in the pharmacokinetics of drugs and because both ‘too deep’ and ‘too light’ anesthesia can be detrimental to patients. The pharmacokinetics of drugs are altered in cardiac surgical patients because of altered haemodynamics, concurrent cardiovascular medications and partly because of the effects of CPB. Furthermore, anesthetic titration – based on HR and arterial pressure responses – may be hindered due to vasoactive medication, e.g. -adrenoceptor blocking drugs, calcium channel blocking drugs and other cardioactive drugs that the patient may be receiving. A decreased incidence of tachycardia and hypertension in the BIS-controlled group may be due to improvements in the titration of drugs.

This presentation will go through
1- The definition, physiology and diagnosis of awareness
2- Challenges that we face in these patients intraoperatively
Recommendations for the safe management of this patient population