



Bispectral index

Ertan SÖNMEZ¹, Abuzer ÖZKAN^{*2}

¹Department of Emergency Medicine, Faculty of Medicine, Bezmialem Foundation University, İstanbul, Turkey

²Department of Emergency Medicine, University of Health and Sciences, Ümraniye Training and Research Hospital, İstanbul, Turkey

Received: 04.09.2021

Accepted/Published Online: 07.10.2021

Final Version: 18.03.2022

Dear Editor,

We have read the article titled "Relationship between the national institutes health stroke scale score and bispectral index in patients with acute ischemic stroke" prepared by Özdemir et al. with great interest (1). We thank the authors and the editorial board for publishing this informative and successful manuscript. We also would like to mention a few important points about bispectral index.

Despite the modern methods and new drugs developed in surgery and anesthesia, anesthesia application and surgical intervention continue to be a stress factor for the human organism. These applications cause neuroendocrine response along with hemodynamic changes (2). These changes are largely dependent on stimulation of the sympathetic and adrenal systems. With the stimulation of this system, the level of catabolic hormones such as adrenaline, noradrenaline, and cortisol increases, while inhibition occurs in anabolic hormones such as insulin and testosterone (2). This stimulation and inhibition cause different clinical findings.

While fasting blood glucose and blood lactate levels increase in parallel with the increase in hemodynamic parameters, plasma levels of hormones such as adrenaline, noradrenaline and cortisol also increase. There are many factors that affect these results (2). The patient's age, weight, type and duration of the operation, position, experience of the surgery and anesthesia team, the tools and equipment used, the anesthesia method and the anesthetic drugs used are some of these factors (2).

Evaluation of depth of anesthesia in anesthesia induction and maintenance is an ongoing and highly complex problem (3). With the discovery that the brain generates electrical activity, the fact that anesthetic drugs alter electroencephalography (EEG) became evident (3, 4). For this reason, the interest in the use of EEG for anesthesia monitoring has increased and EEG has been recommended in many studies

as a valuable method for determining the depth of anesthesia. BIS is an interpretation method that quantifies the degree of acute phase coupling among the components of the EEG signal, largely reflecting the cortical EEG (3, 4). Bispectral index monitoring, which enables the measurement of the sedative and hypnotic effects of anesthetic drugs on the central nervous system, is provided with the help of a sensor placed on the frontotemporal region (4, 5). In this way, neuroendocrine side effects of anesthetic drugs can be reduced by monitoring the depth of anesthesia (4, 5). As Özdemir et al. suggested in their study, a second area of use for the bispectral index could be the neurological monitoring of the patient under sedation (1). We believe that it will provide the opportunity to evaluate acute strokes, especially during major cardiovascular surgical procedures.

Conflict of interest

None to declare.

Acknowledgments

None to declare.

References

- Özdemir S, Cimilli Öztürk T, Ecmel Onur Ö. Relationship between the national institutes health stroke scale score and bispectral index in patients with acute ischemic stroke. J Exp Clin Med. 2021; 38(4): 440-4.
- Atım A, Kuyumcu M, Temür S, Özkan S, Gökben M. Bispektral indeks monitörizasyonu altında iki farklı anestezi uygulamasının nöroendokrin ve hemodinamik etkilerinin karşılaştırılması. Gülhane Tıp Derg. 2012; 54: 14-22.
- Liu X, Nakano M, Yamaguchi A, Bush B, Akiyoshi K, Lee JK, et al. The association of bispectral index values and metrics of cerebral perfusion during cardiopulmonary bypass. J Clin Anesth. 2021 Jun 17;74:110395.
- Gümüş F, Erkalp K, Şinikoğlu SN, Sevdı MS, Yektaş A, Polat A, et al. The Effectiveness of Bispectral Index Monitoring on Carotid Endarterectomy with General Anesthesia. GKD Anest Yoğ Bak Dern Derg. 2013; 19(1): 31-6.

5. Kusken O, Ozturk TC, Hunuk A, Akoglu EU, Ak R, Turan CA, et. al. Relationship between brain computed tomography findings and bispectral index score in patients presenting with head trauma.

North Clin Istanbul. 2019; 6:219-25