

## Quotation of Heart Rate Variability Parameters with Their Normalized Units



Kalp Hızı Değişkenliği Parametrelerinin Normalize Birimleri ile Sunumu

**Cite this article as:** Erdem K, Kurtoglu E. Quotation of Heart Rate Variability Parameters with Their Normalized Units. Turk J Anaesthesiol Reanim 2018; 46: 245.

**ORCID IDs of the authors:** K.E. 0000-0002-3657-9013; E.K. 0000-0002-3657-9013.

Dear Editor,

We read the article by Uchida et al. (1) with great interest. In their article, the authors reported that continuous infusion of low-dose remifentanyl may trigger the relative activation of the parasympathetic nervous system in post-surgical patients as assessed with heart rate variability (HRV). The authors measured HRV by using frequency-domain parameters such as low frequency (LF) power, high frequency (HF) power, and LF/HF ratio. The authors gave these parameters in absolute or raw values (milliseconds squared), which are commonly reported in this form in most studies. The measurement of LF and HF power components can also be presented in their normalized units, which are calculated from the absolute or raw values of LF or HF divided by the total spectral power. Although LF/HF ratio gives information about which branch of autonomic nervous system is the prominent one, normalization of LF and HF power gives also complementary information regarding the controlled and balanced behavior of the sympathetic and parasympathetic branches of autonomic nervous system. In addition, the reporting of LF and HF solely as raw or absolute powers may obscure the underlying interpretation. For this reason, LF and HF values should be given in absolute units as well as in the normalized unitless form, as recommended by the Task Force of the European Society of Cardiology and the North American Society of Pacing and Electrophysiology (2).

Kenan Erdem<sup>1</sup> , Ertugrul Kurtoglu<sup>2</sup> 

<sup>1</sup>Department of Cardiology, Medova Hospital, Konya, Turkey

<sup>2</sup>Department of Cardiology, Malatya Education and Research Hospital, Malatya, Turkey

### References

- Uchida S, Kadoi Y, Saito S. Effect of Low Dose Remifentanyl on Postoperative Pain Relief and Heart Rate Variability in Post-Anaesthesia Care Unit. Turk J Anaesthesiol Reanim 2017; 45: 297-302. [\[CrossRef\]](#)
- Task Force of the European Society of Cardiology and the North American Society of Pacing and Electrophysiology. Heart rate variability: standards of measurement, physiological interpretation, and clinical use. Circulation 1996; 93: 1043-65.

**Corresponding Author/Sorumlu Yazar:** Ertugrul Kurtoglu  
E-mail: erkurtoglu@hotmail.com

DOI: 10.5152/TJAR.2018.43067

©Copyright 2018 by Turkish Anaesthesiology and Intensive Care Society - Available online at www.jtaics.org

©Telif Hakkı 2018 Türk Anesteziyoloji ve Reanimasyon Derneği - Makale metnine www.jtaics.org web sayfasından ulaşılabilir.



### Author's Reply

## Re: Quotation of Heart Rate Variability Parameters with Their Normalized Units

Yanıt: Kalp Hızı Değişkenliği Parametrelerinin Normalize Birimleri ile Sunumu

**Cite this article as:** Kadoi Y. Re: Quotation of Heart Rate Variability Parameters with Their Normalized Units. Turk J Anaesthesiol Reanim 2018; 46: 245.

Dear Editor,

Thank you so much for your excellent advice regarding our article.

Before we reply to your comments, we had several mistakes in the table 2 and 3. LF/HF has been corrected to LF/HF.

We agree with your comment about showing the raw data for LH and HF instead of the normalized units of LF and HF.

In our study, we demonstrated that LF or HF values were expressed as the normalized units of LF and HF, which were calculated according to the following formulas; LF(%)=LF/TP×100% and HF(%)=HF/TP×100%. TP; total power.

Because of the technical limitation of our analysis machine of HRV, we showed the normalized units of LF and HF in this study. There is a report, which suggests that normalized units of LF and HF are more sensitive indicators compared with the raw data of LH and HF for assessing sympathetic and parasympathetic tone (1). In addition, we compared the values of LF, HF, and LF/HF between pre- and post-administration of remifentanyl in this study. No change was observed in our findings, even in case of the use of raw data of LH and HF instead of the normalized units of LF and HF.

Again, thank you so much for your excellent comments.

Yuji Kadoi

Department of Anaesthesiology, Gunma University Hospital, Gunma, Japan

### References

- Komatsu T, Fujiwara Y, Hashimoto A, Harato M, Ito H. Analysis of heart rate Variability. Masui 2009; 58: 820-31.

**Corresponding Author/Sorumlu Yazar:** Yuji Kadoi  
E-mail: kadoi@gunma-u.ac.jp

DOI: 10.5152/TJAR.2018.010518

©Copyright 2018 by Turkish Anaesthesiology and Intensive Care Society - Available online at www.jtaics.org

©Telif Hakkı 2018 Türk Anesteziyoloji ve Reanimasyon Derneği - Makale metnine www.jtaics.org web sayfasından ulaşılabilir.

