

The Effect of Makassar Folk Music on Cerebral Hemodynamics Measured by Transcranial Doppler

Andi Kurnia Bintang^{1,2}, David Gunawan^{1,2}, Jimmy¹

¹ Department of Neurology, Faculty of Medicine, Hasanuddin University, Indonesia

² Neurovascular Division, Department of Neurology, Faculty of Medicine, Hasanuddin University, Indonesia

Correspondence: Andi Kurnia Bintang. Email: a.kurnia_b@yahoo.co.id

Abstract

This study aimed to evaluate the effect of Makassar folk music on cerebral hemodynamics using transcranial doppler (TCD). This was an experimental study with a pre- and post-test design. The study was conducted on 30 subjects at the Sonology clinic of Wahidin Sudirohusodo Hospital, Makassar from August to September 2019. The subjects listened to either rock, classical, or Makassar folk music and cerebral hemodynamic parameters before and after listening were assessed using TCD. The results of the study show that there were significant changes in both the left and the right middle cerebral artery (MCA) mean flow velocity (MFV) after listening to three genres, with a p-value < 0.0001 for each genre. There was no significant difference between the changes observed in left MFV MCA compared to the one on the right side. The value of MFV change was not significantly different across genres. The results indicate that Makassar folk music has the same effect on increasing cerebral hemodynamics as classical music and rock music.

Keywords: Cerebral Hemodynamics, Mean Flow Velocity, Music, Transcranial Doppler

1. Introduction

The relationship between music and brain function is increasingly investigated in modern neuroscience. More evidence points to a close relationship between brain activity, cerebral blood flow, and metabolism, implying that tasks requiring cognitive activation, such as listening to music will affect the blood flow velocity of cerebral arteries, particularly within regions involved in musical perception. Increased cerebral blood flow rate reflects higher brain metabolism activated by cognitive, motor, and sensory tasks. Music is known to induce and modify cognitive, mental, and emotional states. The act of listening to music results in the extensive activation of neural networks in the human brain, and has been regarded as a potential treatment option for psychological and neurological diseases (Antić et al., 2012; Hsu & Lai, 2004; Osuch et al., 2009).

In the past decade, a growing body of evidence on the use of music interventions in clinical practice has emerged, through singing, listening to music, music improvisation, and structured music therapies. Given that music involves multiple brain regions that regulate emotion, motivation, cognition, and motor function, musical



JHMS0422 - Status of Manuscript (updated)

Dear A/Prof Andi Kurnia Bintang, MD PhD,

Congratulations! The feedback on your submitted revised manuscript has been attained. As the paper fulfills the threshold of reviewers, your manuscript can now be published. Before doing so, please read the following points carefully:

1. Published Paper

Your paper will be published in the **Journal of Health and Medical Sciences** (10-15 days after payment). If you would like to make any changes to the affiliations of the authors, please do so immediately and send back the file to us. Please ensure that you have sent the complete details of all the author's affiliations and email address if you wish your profile to be updated in the SSRN database. Your article will be prepared for publication in **Vol.4 No.4 December 2021**, with the article published online immediately after payment in the form of *E-Version first*. Please note however that this will depend on whether you complete the payments before 27 December 2022.

2. Publication Payment

Please continue to conduct payment for the publication of your manuscript. The publication fee is USD 175 with the addition of 4% for the Paypal transaction fee, and must be completed within a week from this date. We accept payments through Paypal, in which you have the right to complete payment through your Paypal Account, or Debit/ Credit Card (if you do not have an account). Please find the online invoice to complete the payment:

<https://www.paypal.com/invoice/p/#XLMFBNSBPGTPM879>

If Paypal is not available in your country, you may proceed with the payments via (wise.com), to the following email: editorial@asianinstituteofresearch.org. The amount paid should be in USD currency.

3. Author Photo

Please send us a picture of the main author (please do not send pictures of other authors) so that we can publish your research on our website, complete with the author profile picture.

Regards,
Editorial Team



Asian Institute of Research <editorial@asianinstituteofresearch.org>

Kepada: a.kurnia_b@yahoo.co.id



Kam, 6 Jan jam 14:41

JHMS0422 - Final Publication Draft AIOR

Dear Andi Kurnia Bintang,

Please find the attached file for the final draft of your manuscript. You are now given the right to make any final changes that you wish for the article, before we proceed to publish the article. If you plan to make changes, you may forward the revised file to this email. If you are satisfied with the final draft, please reply to this email stating that we can proceed with the publication. ***Please highlight the changes that you have made to the article, so we can identify whether the changes made are acceptable and to ensure it does not go against the publication policies and recommendations of the reviewers.***

NB: We will not facilitate any other changes to the article once you have agreed to publish the draft. The article will be directly processed for indexing and publication.



Asian Institute of Research <editorial@asianinstituteofresearch.org>

Kepada: A.Kurnia Bintang



Jum, 14 Jan jam 09:09

Dear Andi Kurnia Bintang,

Our deepest apologies for the error in the editorial process. Please be advised that we have made the necessary corrections to your article. You may find the revised article in the attached documents.

Regards,
Editorial team



Asian Institute of Research <editorial@asianinstituteofresearch.org>

Kepada: A.Kurnia Bintang



Rab, 19 Jan jam 10:25

Dear Andi Kurnia Bintang,

Thank you for the confirmation. We will now proceed with the publication of your article and will notify you once this process has been completed.

Regards,
Editorial team



Recognition of Submission

Dear A/Prof Andi Kurnia Bintang, MD PhD,

Thank you for submitting your manuscript. Your paper's correspondence ID is JHMS0422. Please refer to this ID in future correspondences. We have forwarded your paper for review.

Regards,
Editorial Team



Publication of Paper

Dear Andi Kurnia Bintang,

Congratulations! We have successfully published your article on our website. Please find the following link to see the details: [click here](#)

Feedback

If you have the spare time, please give a review of your experience working with us! The form only takes 1-2 minutes to complete: <https://www.asianinstituteofresearch.org/feedback>

Increase Citation

To ensure the visibility of your published article on the web, we recommend you to upload your recently published article to *ResearchGate*, which is the social networking site for scientists and researchers to share papers, ask and answer questions, and find collaborators.

Thank you again for trusting us with your research. We look forward to cooperating with you again in the near future.

Regards,
Editorial Team