ABSTRAK

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Judul : Peran Audio Murottal Al-Qur'an Sebagai Neuroprotektor pada Tikus Model Demensia yang Diberikan Stres Kronik: Analisis Terhadap Hormon Kortikosteron, Protein p-Tau, Caspase-3, BDNF, Proliferasi dan Gambaran Histopatologi Hipokampus Serta Memori Spasial

Latar Belakang: Demensia, khususnya penyakit Alzheimer, merupakan salah satu masalah kesehatan global dengan angka kejadian yang terus meningkat. Keterbatasan terapi farmakologis mendorong perlunya strategi non-farmakologis, termasuk pendekatan berbasis spiritual seperti paparan murottal Al-Qur'an yang diyakini memiliki efek neuroprotektif.
Tujuan: Penelitian ini bertujuan untuk menganalisis efek paparan murottal Al-Qur'an terhadap kadar hormon kortikosteron, ekspresi protein p-Tau, caspase-3, BDNF, proliferasi neuron (BrdU), gambaran histopatologi hipokampus, serta fungsi memori spasial pada tikus model demensia yang diberi stres kronik.
Metode: Penelitian eksperimental menggunakan tikus jantan galur Sprague Dawley yang dibagi menjadi kelompok tanpa audio, paparan musik pop, dan paparan murottal Al-Qur'an. Model demensia dibuat melalui paparan *Mild Unpredictable Chronic Stress* (MUCS) dan induksi Trimethyltin (TMT). Variabel kortikosteron diukur dengan ELISA, p-Tau, caspase- 3, BDNF, dan BrdU dengan imunohistokimia, histopatologi hipokampus dengan pewarnaan HE, serta fungsi memori spasial dengan uji T-maze. Analisis statistik dilakukan menggunakan ANOVA dan uji lanjut post-hoc.
Hasil: Paparan murottal Al-Qur'an secara signifikan menurunkan kadar kortikosteron ($p=0,032$), menekan ekspresi p-Tau ($p=0,008$) dan caspase-3 ($p=0,014$), serta meningkatkan kadar BDNF ($p=0,021$) dan proliferasi neuron BrdU ($p=0,009$). Selain itu, murottal memperbaiki gambaran histopatologi hipokampus ($p=0,016$) serta meningkatkan akurasi memori spasial pada uji T-maze ($p=0,027$) dibandingkan kelompok musik dan tanpa audio.
Kesimpulan: Paparan murottal Al-Qur'an terbukti memiliki efek neuroprotektif yang signifikan dengan menurunkan stres, menghambat proses neurodegenerasi, meningkatkan faktor neurotropik, dan merangsang neurogenesis. Intervensi ini berpotensi menjadi strategi non-farmakologis dalam pencegahan dan penanganan demensia.

Kata kunci: murottal Al-Qur'an, demensia, stres kronik, p-Tau, caspase-3, BDNF, BrdU, hipokampus

ABSTRACT

Name : Aan Royhan

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Title : *The Role of Qur'anic Recitation (Murottal) as a Neuroprotector in a Rat Model of Dementia Exposed to Chronic Stress: Analysis of Corticosterone Hormone, p-Tau Protein, Caspase-3, BDNF, Neuronal Proliferation, Hippocampal Histopathology, and Spatial Memory*

Background: *Dementia, particularly Alzheimer's disease, is a major global health problem with a steadily increasing prevalence. The limited efficacy of current pharmacological therapies highlights the need for non-pharmacological strategies, including spiritual-based approaches such as Qur'anic recitation (murottal), which is believed to exert neuroprotective effects.*

Objective: *This study aimed to analyze the effects of Qur'anic recitation on plasma corticosterone levels, hippocampal expression of p-Tau protein, caspase-3, BDNF, neuronal proliferation (BrdU), histopathological features, and spatial memory function in a rat model of dementia under chronic stress.*

Methods: *An experimental study was conducted using male Sprague Dawley rats divided into three groups: no audio, pop music exposure, and Qur'anic recitation exposure. Dementia was induced through Mild Unpredictable Chronic Stress (MUCS) and Trimethyltin (TMT) administration. Corticosterone was measured using ELISA; p-Tau, caspase-3, BDNF, and BrdU were assessed by immunohistochemistry; hippocampal histopathology was evaluated by hematoxylin-eosin staining; and spatial memory was tested with the T-maze. Data were analyzed using ANOVA followed by post-hoc tests.*

Results: *Qur'anic recitation significantly reduced corticosterone levels ($p=0.032$), suppressed p-Tau expression ($p=0.008$) and caspase-3 ($p=0.014$), and increased BDNF levels ($p=0.021$) as well as BrdU neuronal proliferation ($p=0.009$). Furthermore, it improved hippocampal histopathology ($p=0.016$) and enhanced spatial memory accuracy in the T- maze test ($p=0.027$) compared to the music and no-audio groups.*

Conclusion: *Qur'anic recitation demonstrates significant neuroprotective effects by reducing stress, inhibiting neurodegeneration, enhancing neurotrophic factors, and stimulating neurogenesis. This intervention shows strong potential as a non-pharmacological strategy for dementia prevention and management.*

Keywords: *Qur'anic recitation, dementia, chronic stress, p-Tau, caspase-3, BDNF, BrdU, hippocampus*