

## **Pengaruh Sengatan Listrik Terhadap Perubahan Ekspresi Interleukin-6 (IL-6) dan Interleukin-10 (IL-10) pada Medula Spinalis Tikus Albino Galur Wistar**

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### **ABSTRAK**

**Latar Belakang:** Cedera listrik yang merupakan salah satu bentuk dari trauma mekanik yang menyebabkan morbiditas dan mortalitas yang tinggi. Insidensi cedera medulla spinalis akibat trauma listrik berada diantara 2% dan 5%. Trauma listrik pada medula spinalis dapat menimbulkan kerusakan jaringan medulla spinalis yang mempengaruhi ekspresi IL-6 dan IL-10. Hubungan antara kadar IL-6 dengan IL-10 serum akibat sengatan listrik pada medula spinalis penting untuk dievaluasi dan diharapkan dapat membantu para klinisi untuk mendapatkan korelasi dan pemahaman lebih baik tentang kadar IL-6 dan IL-10 pada pasien dengan sengatan listrik pada medula spinalis. Penelitian ini bertujuan untuk melihat pengaruh paparan trauma listrik terhadap kerusakan neuron dan ekspresi IL-6 dan IL-10 pada medula spinalis (studi eksperimental pada tikus albino galur wistar).

**Metode:** Penelitian ini merupakan penelitian eksperimental (intervensional) laboratorik, dengan desain *post test only control design* terhadap tikus wistar (*Rattus norvegicus*) yang diperoleh Laboratorium Anatomi FK Universitas Muhammadiyah Yogyakarta. Sebanyak 15 ekor tikus perlakuan dipilih secara acak dan dibagi dalam 3 kelompok. Organ medula spinalis segmen *cervical* diambil secara utuh dan dianalisis dengan metode baku histologi dan pemeriksaan imunohistokimia. Tingkat *immunoreactivity* IL-6 dan IL-10 dari masing-masing perlakuan, dianalisis dengan menggunakan *software Image-J*. Data dianalisis dengan perangkat lunak SPSS.

**Hasil:** Terdapat perbedaan rerata ekspresi IL-6 dan IL-10 yang signifikan berdasarkan ketiga kelompok perlakuan. Pada analisis *post-hoc* untuk ekspresi IL-6 dan IL-10, terdapat perbedaan antara kelompok kontrol dibandingkan dengan kelompok intervensi ( $p = 0,008$ ) dan ( $p = 0,014$ ).

**Kesimpulan:** Terdapat pengaruh bermakna trauma listrik terhadap kerusakan neuron dan ekspresi IL-6 dan IL-10 pada medula spinalis. Terdapat perbedaan yang signifikan pada durasi trauma listrik terhadap kerusakan neuron pada medula spinalis.

**Kata Kunci:** IL-6, IL-10, Medula Spinalis, Trauma Listrik

## **The Effect of Electric Shock on Expression Changes of Interleukin-6 (IL-6) and Interleukin-10 (IL -10) in the Spinal Cord of Albino Wistar Rats**

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### **ABSTRACT**

**Background:** Electrical injury is a form of mechanical trauma that causes morbidity and mortality. The incidence of spinal cord injury due to electrical trauma is between 2% and 5%. Electrical trauma to the spinal cord can cause damage to spinal cord tissue which affects the expression of IL-6 and IL-10. The relationship between serum IL-6 and IL-10 levels due to electric shock to the spinal cord is important to evaluate and is expected to help clinicians to get a better correlation and understanding of IL-6 and IL-10 levels in patients with electric shock to the spinal cord. This study aims to examine the effect of exposure to electrical trauma on neuronal damage and the expression of IL-6 and IL-10 in the spinal cord (experimental study in Wistar albino rats).

**Method:** This research is an experimental (interventional) laboratory study, with a *post test only control design* on Wistar rats (*Rattus norvegicus*) obtained by the Anatomy Laboratory Faculty of Medicine, Muhammadiyah Yogyakarta University. A total of 15 mice were randomly selected and shared in 3 groups. The spinal cord organs in the cervical segment were taken intact and analyzed using standard methods of histology and immunohistochemistry. The levels of IL-6 and IL-10 immunoreactivity from each treatment were analyzed using Image-J software . Data were analyzed with SPSS software.

**Results:** There were significant differences in the mean expression of IL-6 and IL-10 based on the three treatment groups. In post-hoc analysis for IL-6 and IL-10 expression, there were differences between the control group compared to the intervention group ( $p = 0.008$ ) and ( $p = 0.014$ ).

**Conclusion:** There is a significant effect of electrical trauma on neuronal damage and IL-6 expression and IL-10 in the spinal cord. There is a significant difference in the duration of electrical trauma on neuronal damage in the spinal cord.

**Keywords:** IL-6, IL-10, Spinal Cord, Electrical Trauma