

ABSTRAK

PENGARUH PAPARAN TRAUMA LISTRIK TERHADAP EKSPRESI S100B NEUROGLIA PADA OTAK

Latar Belakang

Cedera kepala akibat listrik sangat jarang terjadi dan merupakan tantangan yang sulit bagi ahli bedah. Gangguan neurologis terkait cedera listrik yang dapat terjadi termasuk kehilangan kesadaran, perubahan mental, dan neuropati perifer. Mendeteksi tingkat keparahan cedera pada tahap awal, memprediksi perkembangannya dan mencegah kerusakan sekunder penting dilakukan, sehingga penggunaan pemeriksaan biomarker memainkan peran penting. Salah satu biomarker serum yang paling banyak dipelajari adalah protein pengikat kalsium B (S100B). Tujuan dari penelitian ini melihat pengaruh paparan trauma listrik terhadap ekspresi S100B otak menggunakan objek penelitian tikus wistar galur murni.

Metode

Penelitian ini dilakukan secara eksperimental (intervensional) laboratorik, dengan desain *post test only control design* yang menggunakan hewan percobaan sebagai obyek penelitian. Pada penelitian ini, digunakan 9 ekor tikus wistar galur murni sebagai objek penelitian yang dibagi menjadi 3 kelompok perlakuan yaitu kelompok kontrol (K), pemberian tegangan listrik (0,05 A + 220 v + 12 watt + 50 Hz) selama 15 detik (I) dan selama 45 detik (II). Kerusakan neuron diidentifikasi secara mikroskopik pada pewarnaan *hematoxylin eosin*. S-100B dianalisis dengan menggunakan pemeriksaan imunohistokimia. Data kemudian dianalisa menggunakan perangkat lunak statistik dengan nilai p dianggap bermakna <0,05.

Hasil

Hasil pemeriksaan kadar S100B pada ketiga kelompok menunjukkan rerata jumlah astrosit dengan S100B yang tinggi ditemukan pada kelompok kontrol 46 ± 5.000 , kelompok intervensi I 36 ± 2.646 , dan kelompok intervensi II $37,67 \pm 13.650$. Pada analisa bivariat untuk mengetahui perbedaan jumlah sel yang ditemui S100B antar kelompok kontrol dan perlakuan dilakukan uji ANOVA dan didapatkan nilai p 0,369.

Simpulan

Terdapat pengaruh bermakna trauma listrik terhadap kerusakan otak. Namun, tidak terdapat pengaruh trauma listrik terhadap ekspresi S100B pada otak. Begitu juga dengan durasi trauma listrik tidak mempengaruhi ekspresi S100B pada otak.

Kata kunci: cedera, ekspresi, listrik, kepala, kerusakan, otak, S100B.

ABSTRACT

EFFECT OF ELECTRIC TRAUMA EXPOSURE ON EXPRESSION OF S100B NEUROGLIA IN THE BRAIN

Background

Electrical head injuries are extremely rare and pose a difficult challenge for surgeons. Neurological disorders associated with electrical injury that can occur include loss of consciousness, mental changes, and peripheral neuropathy. Detecting the severity of injury at an early stage, predicting its progression and preventing secondary damage is important, so the use of biomarker assays plays an important role. One of the most studied serum biomarkers is calcium binding protein B (S100B). The purpose of this study was to examine the effect of exposure to electrical trauma on the expression of brain S100B using pure strain wistar rats as the object of research.

Method

This research was conducted in an experimental (interventional) laboratory, with a post test only control design using experimental animals as research objects. In this study, 9 pure-breed wistar rats were used as research objects which were divided into 3 treatment groups, namely the control group (K), exposure to electrical trauma (0.05 A + 220 v + 12 watts + 50 Hz) for 15 seconds (I) and for 45 seconds (II). Neuronal damage was identified microscopically on hematoxylin eosin staining. S-100B was analyzed using immunohistochemical examination. The data were then analyzed using statistical software with *p*-values considered significant <0.05.

Results

The results of the examination of S100B levels in the three groups showed the mean number of astrocytes with high S100B was found in the control group $46 \pm 5,000$, intervention group I $36 \pm 2,646$, and intervention group II $37,67 \pm 13,650$. In the bivariate analysis to determine the difference in the number of cells found by S100B between the control and treatment groups, ANOVA test was performed and the *p*-value was 0.369.

Conclusion

There is a significant effect of electrical trauma on brain damage. However, there was no effect of electrical trauma on S100B expression in the brain. Likewise, the duration of electrical trauma did not affect the expression of S100B in the brain.

Keywords: Brain, Damage, Expression, Electricity, Head, Injury, S100B.