

## **ABSTRACT**

### **THE EFFECT OF INTRAMUSCULAR INJECTION HUMAN UMBILICAL CORD MESENCHYMAL STEM CELL TO LUNGS OF RATS (*Rattus norvegicus*) WITH CIGARETTE SMOKE EXPOSURE**

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**Background:** Smoking habits had proved to cause more than 25 types of diseases that attack various human organs, including the lungs. Mesenchymal stem cells were an important source of tissue repair and regeneration through their ability to secrete bioactive metabolites.

**Method:** This study was a laboratory experimental study using 27 white rats divided into three groups, the control group (K), exposed by cigarettes smoke (P1), exposed by cigarettes smoke and injected intramuscular human umbilical cord mesenchymal stem cells. (P2). The study was conducted for 42 days. After examination of pulmonary histopathology, the data were analyzed using the Kruskal-Wallis and post hoc Mann-Whitney statistical tests.

**Result:** The results were obtained estimated level of lung parenchyma damage between KK and P1, KK and P2, as well as P1 and P2 because the value of  $p = 0,000$  was obtained so  $p < 0,05$ , the expected results obtained  $H_0$  were expected.

**Conclusion:** There was effect of intramuscular injection human umbilical cord mesenchymal stem cell to lungs of rats (*Rattus norvegicus*) with cigarette smoke exposure

**Keywords:** cigarette smoke, human umbilical cord mesenchymal stem cells, intramuscular injection, histopathology of lungs.

## **ABSTRAK**

### **PENGARUH INJEKSI INTRAMUSKULAR SEL PUNCA MESENKIMAL TALI PUSAT MANUSIA TERHADAP HISTOPATOLOGI PARU TIKUS PUTIH (*Rattus norvegicus*) YANG TERPAPAR ASAP ROKOK**

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**Latar Belakang:** Kebiasaan merokok terbukti menyebabkan kurang lebih 25 jenis penyakit yang menyerang berbagai organ tubuh manusia terutama paru. Sel punca mesenkimal merupakan sumber penting perbaikan dan regenerasi jaringan melalui kemampuannya mensekresikan metabolit bioaktif.

**Metode:** Penelitian ini merupakan penelitian eksperimental laboratorik menggunakan 27 ekor tikus putih yang dibagi menjadi tiga kelompok, kelompok kontrol (K), yang dipaparkan asap rokok (P1), dan yang dipaparkan asap rokok serta diinjeksi intramuskular sel punca mesenkimal tali pusat manusia (P2). Penelitian dilakukan selama 42 hari. Setelah itu dilakukan pengamatan terhadap histopatologi paru, kemudian data dianalisis menggunakan uji statistik *Kruskal-Wallis* dan *post hoc Mann-Whitney*.

**Hasil:** Diperoleh hasil terdapat perbedaan derajat kerusakan parekim paru antara KK dan P1, KK dan P2, serta P1 dan P2 karena diperoleh nilai  $p=0,000$  sehingga  $p<0,05$  maka didapatkan hasil bermakna yang berarti  $H_0$  ditolak.

**Kesimpulan:** Terdapat pengaruh injeksi intramuskular sel punca mesenkimal tali pusat manusia terhadap histopatologi paru tikus putih (*Rattus norvegicus*) yang terpapar asap rokok.

**Kata Kunci:** asap rokok, injeksi intramuskular, histopatologi paru, sel punca mesenkimal tali pusat manusia.