**EFFECTIVENESS OF MESENCHYMAL STEM CELLS AND BOVINE COLOSTRUM ON DECREASING TNF- α LEVELS AND ENHANCEMENT OF MACROPHAGES M2 IN REMNANT LIVER**

**Ezra Endria Gunadi1\*, Yan Wisnu Prajoko1, Agung Putra2**

*1 Department of Biomedical, Faculty of Medicine, Diponegoro University*

*2 Stem Cells and Cancer Research, Faculty of Medicine, Sultan Agung Islamic University, Semarang, Indonesia*

**Abstract**

Introduction: Mesenchymal stem cells (MSCs) and bovine colostrum are potential therapies for the treatment of various degenerative and immune diseases.

Aim: To analyze the effect of giving MSCs on levels of TNF- α and Macrophages M2 in the liver fibrosis of wistar rats after 50% resection.

Methods: This study is a quasi-experimental post-test-only control group design to analyze the effect of giving bovine colostrum and mesenchymal stem cells to test animals on the process of regeneration of the remaining 50% liver with fibrosis. The study was conducted at the Stem Cell and Cancer Research (SCCR) Universitas Sultan Agung. The number of samples used was 40 male Wistar rats.The independent variables included MSC 1.000.0000 cells and bovine colostrum at a dose of 15 µL/gram. Dependent variables used weremacrophages M2 and levels of TNF-α ELISA.

Results: TNF- α levels on day 3 were (p=0.001), day 7 were (p=0.01), and day10 were (p=0.01) in liver tissue in various study groups analyzed using ELISA on day three\*. The results showed differences which were significant between the control and treatment groups (p<0.05). The expression of CD163 marked brown in liver tissue had more expression than the control group.

Conclusion: The combination of MSCs and bovine colostrum can reduce TNF- α levels and significantly increase macrophages expression in the liver fibrosis of Wistar rats after 50% resection on the 3rd, 7th and 10th days.

**Keywords:** Mesenchymal Stem Cells, Bovine colostrum, *Tumor necrosis factor*-Α (Tnfα), Macrophages M2, Liver