ABSTRACT

Polysaccharide Krestin (PSK) from *C. versicolor* as an Immunomodulator on Rat's *(Rattus norvegicus)* Joint Feet Improvement of Adjuvant Arthritis

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Polysaccharide krestin (PSK) is a protein-bound polysaccharide K obtained from the extraction process of *C. versicolor* fungus that has immunomodulatory properties. RA is one of the chronic inflammatory autoimmune diseases. The factors that are responsible for RA disease is a balance between the proinflammatory factor and an anti-inflammation factor ie. Th17, Regulatory T cell, Th1 and Th2. TGF-β1 acts as an anti-inflammatory cytokine in inducing the formation of Treg FoxP3 cells in rat and humans and can suppress effector T cells in autoimmune disease.The aim of this study is to explain the potency of PSK from *C. versicolor* as an immunomodulator against the improvement of *Adjuvant arthritis* in rat's *(Rattus norvegicus)* joint feet.

The research method used was experimental laboratory using a Randomized Post Test Only Group Design. The subjects were 66 male adult rats (Rattus norvegicus), aged 16 weeks with 200-250 grams BW, which had been induced by adjuvants (AA). Subjects were divided into 6 groups, 3 treatment groups and 3 control groups. PSK is given at a dose of 50 mg / kg BW / day through gastric sonde for 1, 2 and 3 weeks in 3 different groups. Elisa and Flowcitometry blood tests were performed to see levels of TGF-β1 and T regulator, joint tissue retrieval for histopathology and immunohistochemistry to see joint histopathology scale and MMP3 expression, as well as measurements on the foot thickness..

The results showed a significant difference in TGF-β1 1 week ($p=0,017$), 2 weeks ($p<0,001$) and 3 weeks ($p<0,001$), T Regulatory cell 1 week ($p=0,008$), 2 weeks ($p<0,001$) and 3 weeks ($p<0,001$), MMP3 expression 1, 2 and 3 weeks ($p<0,001$), histopathological joint scale 1, 2 and 3 weeks ($p<0,001$), foot thickness before sacrifice 1, 2 and 3 weeks ($p<0,001$) of PSK given. The correlation between PSK - TGF-β1 levels - $CD4^+CD25^+FoxP3^+$ Regulatory T cell - MMP3 expression - histopathological joint scale - foot thickness during the second and third weeks showed a significant correlation with moderate to strong strength correlation.

Conclusions: Provision of PSK as immunomodulator at dose 50 mg/ kg BW/ day orally potentially improved the Adjuvant Arthritis in the rat's (*Rattus norvegicus*) foot joints through mechanism of increased TGF-β1 levels and $CD4^+CD25^+FoxP3^+$ Regulatory T cells, decreased MMP3 expression, histopathological joint scale and rat's foot thickness with the most effective given time of 2 weeks.

Keywords: *Polysaccharide Krestin* (PSK), CFA, TGF-β1, Regulatory T cells, MMP3, histopathology, foot thickness