LAPORAN AKHIR

Penelitian Unggulan Perguruan Tinggi (M)*

JUDUL

KAJIAN MOLEKULER KEFIR *secara in Vitro* SEBAGAI IMMUNOMODULATOR PENDERITA TB-PARU BTA(+)

Tahun ke 1 dari rencana 2 tahun

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ABSTRAK

Telah dilakukan studi terhadap potensi kefir sebagai immunomodulator secara *in vitro* pada pasien TB. Sebanyak 10 penderita TB paru BTA (+) dan 9 orang sehat diisolasi Periferal Blood Mononuclear Cell (PBMC) nya dan dipapar dengan kefir selama 4 hari dengan berbagai konsentrasi : 1/20, 1/50, 1/100 dan 1/200. Sebagai kontrol positip digunakan PPD (2μg/mL). Pengukuran sitokin Th1 (IFN-γ) dan Th2 (IL-4) dilakukan dengan Flowcytometry. Hasil analisa statistic dengan Anova memperlihatkan bahwa kefir dosis 1/20 yang bisa mengaktifkan IFN-γ lebih tinggi daripada IL-4 pada PBMC pasien TB. Lebih lanjut rasio Th1/Th2 dari dosis yang sama memiliki nilai paling mendekati rasio Th1/Th2 pada orang sehat. Dengan demikian kefir dosis 1/20 kemungkinan bersifat immunostimulant pada PBMC pasien TB.

ABSTRACT

Study on the potency of Kefir as immunomodulator for pulmonary TB has been conducted *in vitro*. A total of 25 subject consist of 15 pulmonary TB-AFB(+) patients and 9 healthy subjects were registered to involve in this study. Periferal Blood Mononuclear Cell (PBMC) of the subject were isolated and kefir with different concentration (1/20, 1/50, 1/100 dan 1/200) was added and the cell culture were grown for 4 days. PPD (2μg/mL) served as positive control. The production of cytokin Th1 (IFN-γ) dan Th2 (IL-4) was measured using Flowcytometry. It is shown that kefir with 1/20 dose could activate IFN-γ much higher than IL-4 on the PBMC of TB patient. Furthermore the same ratio produced Th1/Th2 ratio that almost the same with the Th1/Th2 ratio of healthy subject. We conclude that suplemetation with kefir with 1/20 possibly could function as immunostimulant on PMBC of TB patient.

ABSTRAK

Telah dilakukan studi terhadap potensi kefir sebagai immunomodulator secara *in vitro* pada pasien TB. Sebanyak 10 penderita TB paru BTA (+) dan 9 orang sehat diisolasi Periferal Blood Mononuclear Cell (PBMC) nya dan dipapar dengan kefir selama 4 hari dengan berbagai konsentrasi : 1/20, 1/50, 1/100 dan 1/200. Sebagai kontrol positip digunakan PPD (2μg/mL). Pengukuran sitokin Th1 (IFN-γ) dan Th2 (IL-4) dilakukan dengan Flowcytometry. Hasil analisa statistic dengan Anova memperlihatkan bahwa kefir dosis 1/20 yang bisa mengaktifkan IFN-γ lebih tinggi daripada IL-4 pada PBMC pasien TB. Lebih lanjut rasio Th1/Th2 dari dosis yang sama memiliki nilai paling mendekati rasio Th1/Th2 pada orang sehat. Dengan demikian kefir dosis 1/20 kemungkinan bersifat immunostimulant pada PBMC pasien TB.

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SUMMARY

The long duration of theraphy is one cause of the failure of TB treament. Besides the side effect of the treatment such as hepatotoxicity and loss of appetite. Immunotherapy is considered as new approach for the treatment that could enhance the level of Th1 and lower the Th2.

Kefir is a fermented product of cow milk or goat, that has been considered to be able to produce therapeutic effect because it can stimulate cytokine Th1 and reduce Th2 in the allergic patient (Hong et al, 2010). In Indonesia, studies concerning the therapeutic effect of kefir is limited.

Study on the potency of kefir as immunomodulator for TB patient has been conducted *ex vivo*. A total of 25 subject consist of 15 TB patients and 9 healthy subject were registered to involve in this study. PBMC of the subject were isolated and kefir with different concentration (1/20, 1/50, 1/100 dan 1/200) was added and the cell culture were grown for 4 days. PPD (2μg/mL) served as positive control. The production of cytokin Th1 (IFN-γ) dan Th2 (IL-4) was measured using Flowcytometry. It is shown that kefir could stimulate the secretion of IL-4 of PBMC from TB patient higher that that of IFN-γ. However in the healthy group the level of IFN-γ is higher than IL-4. Anova analysis showed that the concentration difference did not significantly affect the level of IFN-γ as well as IL-4 ($p>0.05$). We conclude that kefir function better as immunorepressor on TB patient and as immunostimulant in healthy person.

We studied the immunomodulator aspect of kefir in TB patient AFB (+) using *ex vivo* approach. A total of 25 subject consist of 15 TB patients and 9 healthy subject were registered to involve in this study. PBMC of the subject were isolated and kefir with different concentration (1/20, 1/50, 1/100 dan 1/200) was added and the cell culture were grown for 4 days. PPD (2μg/mL) served as positive control. The production of cytokin Th1 (IFN-γ) dan Th2 (IL-4) was measured using Flowcytometry. It is shown that kefir with 1/20 dose could activate IFN-γ much higher than IL-4 on the PBMC of TB patient. Furthermore the same ratio produced Th1/Th2 ratio that almost the same with the Th1/Th2 ratio of healthy subject. We conclude that suplemetation with kefir with 1/20 possibly could function as immunostimulant on PMBC of TB patient.

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