

DISERTASI

**PENGARUH PAPARAN ANTIGEN *Blastocystis sp.* TERHADAP KADAR
MALONDIALDEHID, EKSPRESI N-CADHERIN, E-CADHERIN,
VIABILITAS DAN MIGRASI SEL KANKER KOLOREKTAL**

Penelitian in vitro pada *Human Adenocarcinoma Colorectal HT-29*



Oleh

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ABSTRAK

PENGARUH PAPARAN ANTIGEN *Blastocystis sp.* TERHADAP KADAR MALONDIALDEHID, EKSPRESI N-CADHERIN, E-CADHERIN, VIABILITAS DAN MIGRASI SEL KANKER KOLOREKTAL

Selfi Renita Rusjdi

Kasus kanker kolorektal di Sumatera Barat cenderung mengalami peningkatan dari tahun ke tahun. Beberapa penelitian menunjukkan adanya hubungan antara *Blastocystis sp.* dengan kanker kolorektal. Penelitian pendahuluan di Sumatera Barat menemukan bahwa *Blastocystis sp. mixed subtype 1&3* merupakan *subtype* yang paling sering ditemukan. Patomekanisme mengenai pengaruh *Blastocystis sp.* terhadap penyakit kanker kolorektal masih belum jelas terutama pada stres oksidatif dan proses *Epithelial Mesenchymal Transition* (EMT) yang dikenal dapat mempengaruhi progresivitas sel kanker. Penelitian ini bertujuan untuk melihat pengaruh paparan antigen *Blastocystis sp. mixed subtype 1&3* terhadap stres oksidatif (kadar malondialdehid), EMT (ekspresi N/E-cadherin), viabilitas dan migrasi sel HT-29 secara *in vitro*.

Penelitian ini merupakan penelitian eksperimental *post test only control group*. Sel HT-29 hasil kultur dibagi atas; 1 kelompok kontrol (tanpa perlakuan), dan 5 kelompok perlakuan dengan paparan berbagai konsentrasi antigen *Blastocystis sp.* (0.005 µg/ml, 0.01 µg/ml, 0.05 µg/ml, 0.1 µg/ml dan 0.5 µg/ml). Malondialdehid diperiksa dengan metode spektrofotometri. Ekspresi N/E cadherin diperiksa dengan menggunakan RT-qPCR. Viabilitas sel diperiksa dengan menggunakan *MTT assay*, dan migrasi sel diukur dengan *scratch assay*. Untuk melihat kemaknaan dan perbedaan masing – masing variabel dilakukan uji One way Anova dan uji post hoc Tukey.

Penelitian ini mendapatkan bahwa rerata kadar malondialdehid dan ekspresi N-cadherin tertinggi terdapat pada kelompok paparan 0.5 µg/ml dan terendah pada kelompok 0.01 µg/ml. Rerata E-cadherin tertinggi terdapat pada kelompok 0.01 µg/ml dan terendah pada kelompok kontrol. Viabilitas tertinggi dan terendah terdapat pada kelompok 0.1 µg/ml dan 0.005 µg/ml. Migrasi tertinggi dan terendah terdapat pada kelompok 0.5 µg/ml dan 0.05 µg/ml. Terdapat pengaruh paparan antigen *Blastocystis sp* terhadap kadar malondialdehid, ekspresi N/E-cadherin, viabilitas serta migrasi sel HT-29.

Penelitian ini menyimpulkan bahwa antigen *Blastocystis sp. mixed subtype 1&3* pada konsentrasi tertentu dapat menyebabkan stres oksidatif dan EMT yang mendukung peningkatan progresivitas sel kanker.

Kata kunci: *Blastocystis sp.* kanker kolorektal, HT-29, malondialdehid, N-cadherin, E-cadherin, viabilitas, migrasi

ABSTRACT

EFFECT OF *Blastocystis sp.* ANTIGEN EXPOSURE ON MALONDIALDEHYDE LEVEL, EXPRESSION OF N-CADHERIN, E-CADHERIN, VIABILITY AND MIGRATION OF COLORECTAL CANCER CELLS

Selfi Renita Rusjdi

Colorectal cancer cases in West Sumatra tend to increase from year to year. Several studies have shown an association between *Blastocystis sp.* and colorectal cancer. Preliminary research in West Sumatra found that *Blastocystis sp.* mixed subtype 1&3 is the most commonly found subtype. The pathomechanism of the effect of *Blastocystis sp.* on colorectal cancer is still unclear, especially on oxidative stress and the process of Epithelial Mesenchymal Transition (EMT) which is known to affect the progressiveness of cancer cells. This study aims to see the effect of *Blastocystis sp.* antigen mixed subtype 1&3 exposure on oxidative stress (malondialdehyde level), EMT (expression of N/E-cadherin), viability and migration of HT-29 cells in vitro.

This study is a post test only control group experimental study. Cultured HT-29 cells were divided into; 1 control group (without treatment), and 5 treatment groups with exposure to various concentrations of *Blastocystis sp.* antigen (0.005 µg/ml, 0.01 µg/ml, 0.05 µg/ml, 0.1 µg/ml and 0.5 µg/ml). Malondialdehyde was examined by spectrophotometric method. N/E cadherin expression was examined using RT-qPCR. Cell viability was examined using MTT assay, and cell migration was measured by scratch assay. To see the significance and differences of each variable, One-way Anova test and Tukey test were performed.

This study found that the mean malondialdehyde level and N-cadherin expression were highest in the 0.5 µg/ml exposure group and lowest in the 0.01 µg/ml group. The highest mean E-cadherin was in the 0.01 µg/ml group and the lowest in the control group. The highest and lowest viability were found in the 0.1 µg/ml and 0.005 µg/ml groups. The highest and lowest migration were in the 0.5 µg/ml and 0.05 µg/ml groups. There is an effect of exposure to *Blastocystis sp.* antigen on the malondialdehyde level, N/E-cadherin expression, viability and migration of HT-29 cells.

This study concludes that *Blastocystis sp.* mixed subtypes 1&3 antigen at certain concentrations can cause oxidative stress and EMT that support increased cancer cell progressivity.

Keyword: *Blastocystis sp.* colorectal cancer, HT-29, malondialdehyde, N-cadherin, E-cadherin, viability, migration