

Ekspresi Relatif mRNA *p53*, Apaf-1 dan *Survivin* terkait Apoptosis serta *NF-κB*, *TSP-1* dan *bFGF* terkait Angiogenesis pada Jaringan Tumor Payudara Tikus Pasca *Electro Capacitive Cancer Therapy* Frekuensi 150 kHz

Nurul Hidayah
20/467736/PMU/10342

ABSTRAK

Latar belakang: Kanker payudara merupakan kanker yang paling banyak menyebabkan kematian pada wanita di dunia. Perkembangan kanker difasilitasi oleh inhibisi apoptosis serta induksi angiogenesis. Terapi kanker saat ini masih dijumpai masalah berupa kekambuhan, resistensi dan efek samping. Terapi medan listrik statis non-contact, *Electro Capacitive Cancer Therapy* (ECCT) dengan frekuensi menengah merupakan koterapi yang dikembangkan untuk menghambat proliferasi sel-sel tumor. **Tujuan:** Penelitian ini bertujuan untuk mengetahui ekspresi mRNA *p53*, *Apaf-1*, *Survivin* terkait apoptosis dan *NF-κB*, *bFGF* dan *TSP-1* terkait angiogenesis pada jaringan tumor payudara tikus pasca ECCT frekuensi 150 kHz. **Metode:** Sampel jaringan payudara dan nodul tumor payudara tikus yang tersimpan dalam RNA later pada suhu -20°C. Jaringan tersebut berasal dari kelompok Non Induksi Non Terapi (NINT); Induksi Non Terapi (INT); Non Induksi Terapi (NIT) serta Induksi Terapi IT). Ekspresi mRNA *p53*, *Apaf-1*, *NF-κB*, *bFGF* dan *TSP-1* dianalisis menggunakan qRT-PCR dan dihitung dengan rumus Livak. Data dianalisis menggunakan One-way ANOVA dan Post-hoc LSD. **Hasil:** Ekspresi mRNA *p53*, *Apaf-1* dan *TSP-1* pada kelompok IT meningkat secara signifikan, serta ekspresi mRNA *Survivin* dan *bFGF* menurun secara signifikan dibandingkan kelompok INT. Ekspresi mRNA *NF-κB* pada kelompok IT tetap sama dengan kelompok INT. **Kesimpulan:** ECCT frekuensi 150 kHz dapat mengupregulasi ekspresi mRNA *p53*, *Apaf-1* dan *TSP-1* serta mendownregulasi ekspresi mRNA *Survivin* dan *bFGF* tetapi tidak berpengaruh pada ekspresi mRNA *NF-κB* pada jaringan tumor payudara tikus.

Kata kunci : Kanker payudara, ECCT, Apoptosis, Angiogenesis, Ekspresi Gen.

Relative Expression mRNA of *p53*, *Apaf-1* and *Survivin* Related Apoptosis
and *NF-κB*, *TSP-1* and *bFGF* Related to Angiogenesis on Rat Breast Tumour
Tissue Post Electric Capacitive Cancer Therapy Frequency 150 kHz

Nurul Hidayah
20/467736/PMU/10342

ABSTRACT

Background: Breast cancer is the most common cancer that causes death in women in the world. Cancer development is facilitated by inhibition of apoptosis as well as induction of angiogenesis. Current cancer therapy still encounters problems in the form of recurrence, resistance and side effects. Non-contact static electric field therapy, Electro Capacitive Cancer Therapy (ECCT) with medium frequency is a therapy developed to inhibit the proliferation of tumour cells. **Objective:** This study aims to determine the mRNA expression of p53, Apaf-1, Survivin related to apoptosis and NF-κB, bFGF and TSP-1 related to angiogenesis in rat breast tumour tissue after ECCT frequency of 150 kHz. **Methods:** Breast tissue samples and rat breast tumour nodules stored in RNA later at -20°C. The tissue comes from the Non-Induction Non-Therapy (NINT) group; Induction Non-Therapy (INT); Non-Induction Therapy (NIT); Induction and Therapy (IT). mRNA expression of p53, Apaf-1, NF-κB, bFGF and TSP-1 were analysed using qRT-PCR and calculated with the Livak formula. Data were analysed using One-way ANOVA and Post-hoc LSD. **Results:** mRNA expression of p53, Apaf-1 and TSP-1 in the IT group increased significantly, and mRNA expression of Survivin and bFGF decreased significantly compared to the INT group. But the expression of NF-κB mRNA in the IT group remained the same as in the INT group. **Conclusion:** ECCT with a frequency of 150 kHz could upregulate p53, Apaf-1 and TSP-1 mRNA expression and downregulate Survivin and bFGF mRNA expression but had no effect on NF-κB mRNA expression in rat breast tumour tissue.

Keywords: Breast Cancer, ECCT, Apoptosis, Angiogenesis, Gene Expression.