Analisis Ekspresi Nuclear Factor kappa ? (NF-kB) Pada Sel Punca Kanker Payudara Manusia (CD 24-/CD 44+) yang Diberi H2O2 dan Hubungannya Dengan Viabilitas Sel = Expression of Nuclear Factor â kappa B (NF-kB) in Human Breast Cancer Stem Cells (CD 24-/CD 44+) Treated with H2O2 and Its Relationship with Cell Viability

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Abstrak

Latar Belakang : Kanker payudara merupakan salah satu penyebab kematian tertinggi akibat kanker pada wanita di Indonesia. Hal ini diantaranya disebabkan karena adanya resistensi terhadap terapi berlandaskan ROS seperti pada radioterapi maupun kemoterapi. Sel punca kanker payudara (cancer stem cells, CSCs) memiliki peran pada mekanisme resistensi ini. Penelitian terhadulu menunjukkan kemampuan CSCs untuk bertahan terhadap kondisi stress oksidatif pada pemberian rotenon. Karena itu, dalam penelitian ini dilakukan analisis terhadap faktor transkripsi NF-kB pada sel kanker payudara baik CSC maupun non CSC, terkait peran NF-kB dalam mempertahankan viabilitas sel kanker pada kondisi stress oksidatif.
Metode: Penelitian dilakukan pada sel punca kanker payudara manusia (CD24-/CD44+) maupun non sel punca (CD24-/CD44-) yang diberi H2O2 dengan konsentrasi 1.1µM, 11µM, dan 110µM dengan kontrol sel yang tidak diberi H2O2. Penilaian dilakukan terhadap parameter ekspresi mRNA NF-kB, dan viabilitas sel. Uji statistik dilakukan menggunakan IBM-SPSS dengan nilai < 0.05.
Hasil: Pemberian H2O2 pada konsentrasi 11µM menunjukkan peningkatan yang signifikan pada ekspresi mRNA NFkB CSCs dibanding non CSCs (p<0.05). Sedangkan untuk hasil uji viabilitas pada seluruh konsentrasi H2O2 nampak bahwa CSCs mampu mempertahankan viabilitasnya dibandingkan dengan non CSCs yang mengalami penurunan viabilitas (p<0.05)..
Kesimpulan: Kondisi stres oksidatif akibat pemberiaan H2O2 dapat meningkatkan ekspresi mRNA NF-kB pada CSCs sehingga viabilitasnya tetap dapat dipertahankan.
.....Introduction: Breast cancer is one of the highest causes of death from cancer in women in Indonesia. This is partly due to the resistance to ROS-based therapies such as radiotherapy and chemotherapy. Breast cancer stem cells (cancer stem cells, CSCs) have a role in this resistance mechanism. Previous studies demonstrated the ability of CSC to survive oxidative stress conditions due to rotenone administration. Therefore, in this study an analysis was carried out on the transcription factor NF-kB in breast cancer cells, both CSCs and Non CSCs, related to the role of NF-kB in maintaining the survival of cancer cells under conditions of oxidative stress.
Methods: The study was conducted on human breast cancer stem cells (CD24-/CD44+) and non stem cells (CD24-/CD44-) which were given H2O2 at concentrations of 1.1µM, 11µM, and 110µM with control cells not given H2O2. Assessment was carried out on the parameters of NF-kB mRNA expression, and cell viability. Statistical tests were performed using IBM-SPSS with a value of < 0.05.
Results: Administration of H2O2 at a concentration of 11µM showed a significant increase in the expression of NFk-B CSCs mRNA compared to non CSCs (p<0.05). As for the viability test results at all concentrations of H2O2 it appears that CSCs was able to maintain its viability compared to non CSCs which experienced a decrease in viability (p<0.05).

Conclusion: Conditions of oxidative stress due to administration of H2O2 can increase the expression of NF-kB mRNA in CSCs so that its viability can be maintained.
In this study, conditions of oxidative stress due to administration of H2O2 led to an increase in the expression of NF-kB mRNA in CSCs so that cell viability could be maintained.