

## Ekspresi Protein p21 pada Plasenta Normal: Studi Pendahuluan = Expression of p21 Protein in the Normal Placenta: A Preliminary Study

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### Abstrak

**Pendahuluan:** Cyclin-dependent kinase inhibitor 1a (CDKN1A), atau p21, adalah protein yang terutama diatur oleh protein p53 dan memiliki peran penting sebagai pengatur siklus sel. Fungsinya dapat ditemukan dalam proses perbaikan struktur DNA yang rusak, induksi apoptosis, dan penghentian siklus sel. Berkaitan dengan kehamilan, p21 tampaknya diekspresikan dalam sel trofoblas plasenta serta memiliki peran dalam penuaan sel. Namun, data mengenai ekspresi protein p21 pada plasenta normal dan hubungannya dengan karakteristik ibu masih kurang. Oleh karena itu, penelitian ini bertujuan untuk mengukur ekspresi protein p21 pada plasenta normal dan menghubungkannya dengan karakteristik ibu untuk memberikan lebih banyak data mengenai masalah ini.

**Metode:** Jumlah jaringan plasenta normal yang digunakan dalam penelitian ini adalah 22 sampel, semuanya di bawah usia gestasi 42 minggu dan usia ibu 37 tahun. SimpleStep Human P21 Elisa Kit digunakan dalam penelitian ini dan konsentrasi protein p21 dalam bentuk homogenat plasenta diukur secara kuantitatif dengan metode ELISA. Analisis statistik dari data yang dikumpulkan diproses dalam perangkat lunak IBM SPSS Statistics versi 20.0 dengan T-test independen dan Mann-Whitney test, uji normalitas Shapiro-Wilk, dan uji korelasi Pearson dan Spearman.

**Hasil:** Ekspresi protein p21 rata-rata  $26,28 \pm 19,42$  pg/mg protein pada plasenta normal. Berdasarkan usia gestasi nilai rata-rata 40 minggu adalah  $22,06 \pm 10,43$  pg/mg protein dan < 40 minggu adalah  $28,69 \pm 23,10$  pg/mg protein beserta hasil uji korelasi menghasilkan  $r = -0,015$  dan  $p = 0,948$ . Berdasarkan umur ibu nilai rata-rata 30 tahun adalah  $24,35 \pm 23,14$  pg/mg protein dan < 30 tahun adalah  $27,88 \pm 16,60$  pg/mg protein beserta hasil uji korelasi menghasilkan  $r = -0,213$  dan  $p = 0,341$ .

**Kesimpulan:** Distribusi protein p21 ditemukan lebih tinggi pada usia kehamilan < 40 minggu dibandingkan 40 minggu. Distribusi juga lebih tinggi pada usia ibu < 30 tahun dibandingkan usia 30 tahun. Jika dibandingkan dengan plasenta preeklampsia, distribusinya lebih tinggi dibandingkan sampel plasenta normal. Uji korelasi mengenai perbandingan ekspresi p21 dengan usia gestasi dan usia ibu tidak menghasilkan korelasi. Namun perbedaan distribusi dapat dilihat pada data yang dikumpulkan.

.....ntroduction: Cyclin-dependent kinase inhibitor 1a (CDKN1A), or p21, is a protein that is mainly regulated by the p53 protein and has an essential role as a cell-cycle regulator. Its functions can be found in the processes of damaged DNA structure reparation, apoptosis induction, and cell cycle arrest. In correlation to pregnancy, p21 seems to be expressed in the trophoblastic cells of the placenta as well as have a role in cell senescence. However, the data regarding p21 protein expression in the normal placenta and its relation to maternal characteristics is lacking. Thus, this research aims to quantify the expression of p21 protein in the normal placenta and correlate it with maternal characteristics to provide more data concerning this issue.

**Methods:** The amount of normal placental tissues used in this study were 22 samples, all below the gestational age of 42 weeks and the maternal age of 37 years old. SimpleStep Human P21 Elisa Kit was used in this study and the protein concentration of p21 in the form of placental homogenates was

quantitatively measured by ELISA method. Statistical analysis of the data gathered was processed in IBM SPSS Statistics software version 20.0 by using independent T-test and Mann-Whitney test, the normality test of Shapiro-Wilk, and the correlation tests of Pearson and Spearman.

Results: Expression of p21 protein was an average of  $26.28 \pm 19.42$  pg/mg protein in the normal placenta. Based on gestational age the average value of 40 weeks was  $22.06 \pm 10.43$  pg/mg protein and < 40 weeks was  $28.69 \pm 23.10$  pg/mg protein along with the correlation test results of  $r = -0.015$  and  $p = 0.948$ .

According to maternal age the average value of 30 years old was  $24.35 \pm 23.14$  pg/mg protein and < 30 years old was  $27.88 \pm 16.60$  pg/mg protein along with the correlation test results of  $r = -0.213$  and  $p = 0.341$ .

Conclusion: The p21 protein distribution is found higher in gestational age < 40 weeks than 40 weeks.

Distribution is also higher in maternal age < 30 years old than 30 years old. When compared to preeclamptic placenta, the distribution is higher compared to normal placental samples. Correlation test regarding the comparison of p21 expression with gestational and maternal age resulted in no correlation, however the difference in distribution can be seen in the gathered data.