Ekspresi sitoglobin dan antioksidan pada neonatus prematur hipoksia = Cytoglobin expression and antioxidant in preterm neonates hypoxia / David Limanan

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Abstrak

[ABSTRAK
Latar Belakang: Kelahiran prematur masih menjadi salah satu penyebab utama kematian pada neonatus. Diseluruh dunia kematian akibat kelahiran prematur menempati posisi kedua pada anak usia dibawah lima tahun. Kelahiran prematur dapat disebabkan oleh komplikasi dari ibu, janin dan plasenta. Insufisiensi plasenta merupakan komplikasi kehamilan dimana plasenta tidak dapat membawa oksigen dan nutrisi yang diperlukan untuk pertumbuhan janin dalam uterus, sehingga menyebabkan berkurangnya suplai oksigen yang diperlukan janin dan terjadi keadaan hipoksia dalam uterus. Cygb yang terdapat dalam plasenta yang berfungsi dalam metabolisme oksigen akan berusaha menkompensasi keadaan ini agar suplai oksigen kembali normal. Hipoksia yang terus menerus ini dapat menyebabkan meningkatnya reactive oxygen species (ROS). Pada neonatus prematur terjadi peningkatan ROS dapat melalui dua jalur, yaitu : pertama, tidak tersedianya antioksidan. Kedua, berkurangnya kemampuan untuk meningkatkan pembentukan antioksidan sebagai respons dari hiperoksia atau oksidan lain. ROS yang terbentuk akan ditanggulangi oleh antioksidan yang ada sel baik yang enzimatik maupun nonenzimatik.
Metode: Plasenta bayi prematur dibagi dalam dua kelompok berdasarkan status oksigennya menjadi hipoksia dan non hipoksia. Kemudian dilakukan pengukuran ekspresi mRNA dan protein Cygb, serta aktivitas antioksidan MnSOD, CAT, dan Gpx.
Hasil: Terjadi peningkatan protein Cygb, akan tetapi terjadi penurunan ekspresi mRNA Cygb. Terjadi penurunan aktivitas spesifik MnSOD, sedangkan CAT dan GPx tidak berbeda bermakan. Analisis statistik menunjukan hubungan bermakna antara aktivitas spesifik MnSOD dengan aktivitas spesifik GPx dan terdapat hubungan yang bermakana antara mRNA Cygb dengan aktivitas spesifik MnSOD pada neonatus prematur hipoksia dan tidak hipoksia
Kesimpulan: Terjadi peningkatan protein Cygb dan penurunan mRNA Cygb untuk mempertahankan homeostasis janin dalam keadaan hipoksia. Antioksidan pada bayi prematur lebih rendah, akan tetapi hal ini akan dibantu oleh Cygb dalam mengeliminasi ROS yang ada dalam tubuh, terlihat dari penurunan aktivitas spesifik MnSOD pada plasenta prematur hipoksia, sedangkan aktivitas spesifik katalase dan GPx relatif sama.
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ABSTRACT
Background: Preterm birth is still one of the main causes of mortality in neonates. Nowadays, preterm birth is the second most common cause of death in children younger than five years. Preterm birth can be caused by complications of the mother, fetus and placenta. Placenta insufficiency is complication of pregnancy, where the placenta can not carry oxygen and nutrients for fetus growth in uterus, that lead to decrease oxygen supplies for the fetus and hypoxia in uterus. Cygb in placenta, that have function in oxygen metabolism will try to compensate this situation, so the oxygen suplies will back to normal. The hypoxia will increase reactive oxygen species (ROS). In preterm neonates the increase of ROS is cause by: First, there is no antioxidant supplies. Second, the lack of antioxidant respon to hyperoxsia or other oxidan ROS will be eliminate by antioxidant system with in the cell.
Methods: Placenta from preterm neonates divided in teo groups, hypoxia and non hypoxia. And the sample is measure for mRNA Cygb expression, Cygb proteins, and antioxidant activity for MnSOD, CAT and GPx.
Results: The Cygb protein increase in placenta neonates hypoxia, but the expression of mRNA Cygb decrease in placenta neonates hypoxia. There is decrease of MnSOD specific activity in placental neonates hypoxia, but not in CAT and GPx. Statistical analysis show correlation between MnSOD specific activity with GPx specific activity, and correlation between mRNA Cygb with MnSOD specific activity.
Conclusion: There is an increase of Cygb protein and decrease of Cygb mRNA in placental neonates hypoxia, to maintain the neonates homeostasis in hypoxia environment. Antioxidant is lower in preterm, Cygb with the capability to eliminate free radical will help antioxidant to reduce the ROS. It was seen at the decrease of MnSOD specific activity, and the katalase and GPx specific activity is relatively the same in plasenta hipoksia and non hipoksia, Background: Preterm birth is still one of the main causes of mortality in
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