MEDICINE & Health
The Official Journal of The Faculty of Medicine UKM

7th Malaysia Indonesia Brunei Medical Sciences Conference
"TOWARDS A HOLISTIC AND INTEGRATIVE APPROACH IN HEALTHCARE"

22nd - 24th July 2011
Equatorial Hotel, Bangi, Selangor, MALAYSIA

officially by
Y.B Datuk Rosnah Haji Abdul Rashid Shirlin
Deputy Minister of Health Malaysia

Organised by
RENIN EXPRESSION IN THE KIDNEY IS REGULATED BY HYPOXIA INDUCIBLE FACTOR-1α (HIF-1α)

ANI RP, Yulia S, Febriana CI, Frans F, Sri WAJ, Rondang RS, Septelia IW, Mohamad S

Department of Biochemistry and Molecular Biology, Faculty of Medicine, Universitas Indonesia

Background:
Hypoxia could give a rise of protein known as Hypoxia inducible Factor-1 (HIF-1), which turns out to be a transcription factor that plays a key role in hypoxia. On the other hand hypoxia or ischemia that was caused by atherosclerosis and systemic hypoxia could cause hypertension in human when ischemia/hypoxia was occurred in the kidney. Considering those conditions we conclude a hypothesis that renin expression is regulated by HIF-1.

Materials and methods:
This study consist of two parts, first the analysis of HIF-1α and renal renin expression in rats systemic chronic hypoxia and second was to find out the HIF-1 regulation in renin gene expression by trans-binding method. Analysis of HIF-1α and renin mRNA was run by RT-PCR. Whereas protein analysis of HIF-1α was done using Western blot, immunohistochemistry and renin protein was analyzed by ELISA method. Blood gas analysis was measured during treatment.

Results:
Results indicate that relative expression of HIF-1α mRNA was significantly increase during chronic (1, 3, 7 and 14 days) systemic hypoxia. There was a strong correlation between HIF-1α mRNA and its protein (Pearson correlation coefficient=0.9). Immunohistochemistry examination showed that HIF-1α was increased since one day hypoxia, as observed by brown color intensity and has highest intensity in 7 days hypoxia. Relative expressions of renin mRNA was increased since 1 day of hypoxia and reached the highest expression in three days of hypoxia. There was a strong correlation between relative expression of renin mRNA and protein (Pearson coefficient correlation=0.9). We also found a strong correlation between HIF-1α protein and relative expression of renin mRNA (Pearson coefficient correlation=0.7). Transbinding test proofed that renin promoter, containing Hypoxia Respons Element that could bind HIF-1 protein.

Conclusion:
Renin expression is regulated by hypoxia inducible factor-1α.

Keywords:
Hypoxia, hypoxia inducible factor, renin, hypoxia response element