

Volume 6, No. 1 (Supplement)

June 2011

ISSN 1823-2140

The
National University
with an
INTERNATIONAL REACH

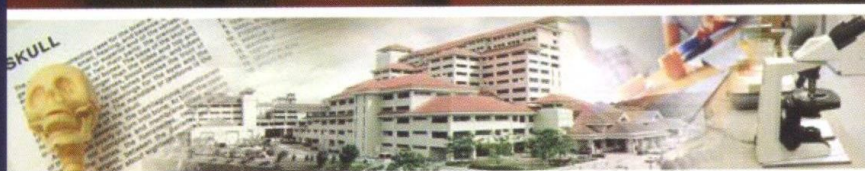


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MEDICINE & Health

The Official Journal of The Faculty of Medicine UKM

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

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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-1 α 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-1 α and renin mRNA was run by RT-PCR. Whereas protein analysis of HIF-1 α 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-1 α mRNA was significantly increase during chronic (1, 3, 7 and 14 days) systemic hypoxia. There was a strong correlation between HIF-1 α mRNA and its protein (Pearson correlation coefficient=0.9). Immunohistochemistry examination showed that HIF-1 α 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-1 α 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-1 α .

Keywords:

Hypoxia, hypoxia inducible factor, renin, hypoxia response element