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# URINARY TRANSFORMING GROWTH FACTOR BETA-١ AS A MARKER OF RENAL DYSFUNCTION IN SICKLE CELL DISEASE

Thesis
Submitted for Partial Fulfillment of Master Degree
**in Pediatrics**


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بسم الله الرحمن الرحيم
إقرأ باسم ربك
الذي خلق{١}خلق
الإنسان من
علق{٢} إقرأ
وربك
الأكرم{٣}الذي
علم بالقلم{٤}علم
الإنسان ما لم
يعلم{٥}
صدق الله العظيم
سورة العلق


*First thanks to* **ALLAH** *to whom I relate any success in achieving any work in my life.*

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# List of Abbreviations

| Abb. | Full term |
|---|---|
| ACE | : Angiotensin converting enzyme. |
| ACR | : Albumin creatinine ratio. |
| ACS | : Acute chest syndrome. |
| AKI | : Acute kidney injury. |
| ALK | : Activin receptor- like kinase. |
| ALP | : Alkaline phosphatase. |
| Ang II | : Angiotensin II. |
| ARB | : Angiotensin II receptor blocker. |
| BMI | : Body mass index. |
| BMP | : Bone morphogenetic protein. |
| BMT | : Bone marrow transplantation. |
| C٣ | : Complement ٣. |
| CBD | : Common bile duct. |
| CKD | : Chronic kidney disease. |
| CKI | : Chronic kidney injury. |
| CMV | : Cytomegalo virus. |
| CO | : Carbon monoxide. |
| CT | : Computerized tomography. |
| CTGF | : Connective tissue growth factor. |
| DBP | : Diastolic blood pressure. |
| DCT | : Distal convoluted tubules. |
| DNA | : Deoxyribonucleic acid |
| DNMT | : Deoxyribonucleic acid methyltrasferase. |
| ECHO | : Echocardiography. |
| ECM | : Extracellular matrix. |
| eGFR | : Estimated glomerular filtration rate. |
| EMT | : Epithelial mesangial transition. |
| EPO | : Erythropoietin. |
| ERCP | : Endoscopic retrograde cholangiopancreatography. |
| ET-١ | : Endothelin-١. |
| FSGS | : Focal segmental glomerulosclerosis. |

# List of Abbreviations (Cont…)

| Abb. | Full term |
|---|---|
| G٦PD | : Glucose ٦ phosphate dehydrogenase. |
| GFR | : Glomerular filteration rate. |
| Hb | : Hemoglobin. |
| HbF | : Fetal hemoglobin. |
| HbS | : Sickle hemoglobin. |
| Hct | : Hematocrite. |
| HGF | : Hepatocytes growth factor. |
| HIF٦a | : Hypoxia inducible factor ٦a. |
| HIV | : Human immunodefficient virus. |
| HLA | : Human leukocyte antigen. |
| HPLC | : High performance liquid chromatography. |
| HU | : Hydroxyurea. |
| HU | : Hydroxyurea. |
| IgA | : Immunoglobulin A |
| IgG | : Immunoglobulin G. |
| IgM | : Immunoglobulin M. |
| $I_KB\alpha$ | : Nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, alpha |
| IV | : Intravenous. |
| IVIG | : Intravenous immunoglobulin. |
| KDa | : Kilodalton. |
| KIM-٦ | : Kidney injury molecule-٦. |
| LAP | : Latency-associated peptide. |
| LDH | : Lactate deyhydrogenase. |
| L-FABP | : Liver-type fatty acid binding protein . |
| LIC | : Liver iron concentration. |
| LLC | : Large latent complex. |
| LR | : Leucoreduction. |
| LTBP | : Latent transforming growth factor-beta ٦ binding protein. |
| MA | : Microalbuminuria. |

# List of Abbreviations (Cont…)

| Abb. | Full term |
|---|---|
| MCH | : Mean corpuscular hemoglobin. |
| MCV | : Mean corpuscular volume. |
| MH | : Mad-Homology. |
| miRNA | : Micro Ribonucleic acid. |
| MRI | : Magnetic resonance imaging |
| Na | : Soduim. |
| NAG | : N-acetyl-ß-D-glucosaminidase. |
| NF-$_K$B | : Nuclear factor kappa-light-chain-enhancer of activated B cells. |
| NGAL | : Neutrophil gelatinase-associated lipocalin. |
| NO | : Nitric oxide. |
| NSAID | : Non steroidal anti-inflammatory drugs. |
| PCT | : Proximal convoluted tubules. |
| PCV | : Packed cell volume. |
| PG | : Prostaglandin |
| Pg/mg Cr | : Picogram/ milligram creatinine. |
| PH | : Power of hydrogen. |
| PP١ | : Protein phosphatase-١. |
| RAAS | : Renin angiotensin aldosterone system. |
| RBCs | : Red blood cells. |
| RBF | : Renal blood flow. |
| ROS | : Reactive oxygen species. |
| RPLS | : Reversible posterior leukoencephalopathy syndrome. |
| R-Smades | : Receptor- associated Smads. |
| SARA | : Smad Anchor for Receptor Activation. |
| SBP | : Systolic blood pressure. |
| SCA | : Sickle cell anemia. |
| SCD | : Sickle cell disease. |
| SCN | : Sickle cell nephropthy. |
| SCT | : Sickle cell trait. |
| SLC | : Small latent complex. |