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Cyclic High Hydrostatic Pressure Treatment to Degenerate Renal Fibrosis In CKD

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Abstract

Increasing End Stage Renal Diseases (ESRD) require renal transplants or dialysis as the effective treatment of choice under current circumstances. Biomechanical microenvironment plays an important role in tissue development and pathogenesis. Accumulation of excessive extracellular matrix (ECM) alters tissue mechanical properties which leads to organ failure Forces potentially operate in fibrosis include hydrostatic osmotic and stretch pressure. Failure to resolve injury and restore haemostasis gives progressive fibrosis which alters the mechanical environment that is matrix deposition and stiffness. Mechanical environment operates organ function and which is a physiological system A potential regenerative approach is an in-situ repair which is an attractive strategy.

High hydrostatic pressure has potential to disrupt structure of ECM through protein denaturation. It achieves devitalisation without damaging biomechanical properties. Intra luminal hydrostatic pressure elevation over 20 -30 cms. H2O causes degenerative changes in tissues and, fibrosis When HP applied by use of hydrostatic fluid column ,hypoxic conditions created that alters cell function, inhibits collagen matrix production and suppress the differentiation of fibroblast to myofibroblast phenotype. Therefore, the priority to treat CKD is to therapeutically manipulate fibrosis and restore its micro vascular circulation.

The cells are mechanically compressed between a strong renal capsule and hydrostatic pressure created by artificial obstruction created at the pelvi-ureteric junction. These act like close chamber pressure. The proposed therapy presents an hypothesis, where the excessive elevation of intraluminal hydrostatic pressure will degenerate renal fibrosis and restore microcirculation functionality to eventually help to rebuild a healthy kidney from native stem cells.

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Biography

Dr..Shrikant L. Kulkarni completed his M.S.(General Surgery) in 1975 from B.J.Medical College Pune,Maharashtra India. The bachelor's degree M.B.B.S. completed from Miraj Medical College. Since 1971 he has worked at several government hospitals like the Wanless Hospital Miraj, Sangli General Hospital Sangli, Sassoon Hospital Pune and multispecialty hospitals like Ruby Hall Clinic, Pune and Jahangir Nursing Home, Pune. For the last 35 plus years he has been working at his own hospital at Chinchwad, Pune Maharashtra India.

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