

# End Stage Renal Disease (ESRD): Is it Reversible?

Dr. K. Jagadeesan<sup>1</sup>, Dr. M. Paul Korath<sup>2</sup>, Dr. Kesav Jagadeesan<sup>3</sup>,  
Dr. K. Mohandas<sup>4</sup>, R. Dhejasvee<sup>5</sup>

<sup>1</sup>Chairman, K. J. Research Foundation & Surgeon, Director, K. J. Hospital, Chennai, Tamil Nadu , India.

<sup>2</sup>Director, K. J. Research Foundation, & Physician, K.J.Hospital, Chennai, Tamil Nadu, India.

<sup>3,4</sup> Surgeon, K. J. Hospital, Chennai

<sup>5</sup>Research Scholar, K. J. Research Foundation, Chennai, Tamil Nadu, India.

## Abstract

As per literature end stage renal failure is rampant in India because the incidence of Diabetes is very high. As per Indian statistics report the incidence of end stage renal failure is found to be 230 per million in India. Hypertension, dislipidemia and other metabolic causes lead to end stage renal failure which in turn necessitates the hemodialysis, peritoneal dialysis or renal transplant for the well being of the individual.

The author is involved in Hemodialysis and Renal Transplant from 1969 onwards. Low Mitochondrial enzyme levels are related to inflammatory processes and oxidative stress, factors implicated in atherosclerosis, obesity, nonalcoholic steato hepatitis (NASH) as well as metabolic syndrome. The objective of the study is whether it can reverse the level of oxidative stress product and improve the oxygen utilization by mitochondria to reverse the above conditions by the supplementation of the mitochondrial enzyme and its substrate in a definitive proportion. It is also found that by modifying the vascular endothelium it also reverses the changes in stroke victims.

**Keywords:** End Stage Renal Failure, Mitochondria, Oxidative Stress, Coenzyme Q10

## Introduction

The end stage renal failure is a major problem affecting the health of the general populations. Since, the incidence of Diabetes and other metabolic diseases are on the increased level especially in India and the rest of the world. In our short series of 10 patients, started 10 years back. This regimen, includes Ubiquinone (CoQ10) enzyme supplement with other substrates like Alpha Lipoic Acid, Seacod and L-Carnitine at definite proportion. Appreciable clinical, biochemical, sonological reversal of Parameters to normalcy is noted and all of them never sorted to any of the bridging or definitive procedures. We advise them to continue this regimen. Here, couple of them after reaching normalcy, they have abandoned KJs-regime. Two of them have restarted recently and parameters reversed to normal. He is being discharged with supply of all the medications from the hospital on weekly basis.

## Address for correspondence

Dr. K.Jagadeesan, Chairman, K J Research Foundation,  
152, Poonamallee High Road, Chennai - 600084, India  
Ph: 044 - 26411513  
Email : kjresearchfoundation@gmail.com, kjh@rediffmail.com

Received: 22.08.19

Accepted: 05.09.19

## Materials and Methods

It is stated that human beings are born with 1 million nephrons in each of the kidney. On an average of daily loss of 4 nephrons, it may increase due to Diabetes, Hypertension and metabolic causes leading to situation called end stage renal failure, where the patient has to be subjected to Hemodialysis or peritoneal dialysis or definitive procedure, a cadaver kidney transplant or living related donor. Looking into the hardships about the patient and the physician and the light thrown by half kidney living comfortably for 25 years as prompted to go into the mechanism of renal nephron rejuvenation [15]. Input from the cell biology and other things prompted to give a try of the same regimen which cell biologists use for tissue rejuvenation and we applied the same for kidney rejuvenation. We have used the mitochondrial enzyme named CoQ10 (Ubiquinone) in combination with Alpha lipoic acid, seacod oil and L-Carnitine on a definitive proportion. The above drugs have to be taken along with first meal as a single dose. All the above mentioned drugs are non-toxic to the living cells. This combination therapy is rejuvenating the failing mitochondrial function. It is stated that the biological clock can be reversed to some extent. It is observed that mitochondrial oxygen utilization upto the age of 40 is around 85%, only 15% of oxidative stress products are released. As age advances

the oxidative stress product ratio increases, greying of hair, wrinkling of skin and other metabolic changes leading to aging. This oxidative theory of cell aging is supported by the fact that diseases associated with the aging process are marked by increased oxidative stress. Coenzyme Q10 (CoQ10) levels fall with aging in the human. As a result, the ability of cells to regenerate and withstand stress declines. Because CoQ10 decline correlates with the aging process, it is regarded as one of the most accurate biomarkers of aging. CoQ10 is vital for many chemical reactions in cells such as oxidative phosphorylation, electron transport chain, aerobic cellular respiration; in fact, it helps produce 95% of body's energy. Without these types of biochemical reactions, the cells would be unable to grow and divide [8].

During End stage renal failure, the progressive deterioration of renal function includes several biological and clinical dysfunctions including alteration in cellular energy metabolism, change in nitrogen input/output, protein malnutrition, resistance to insulin and considerable enhancement of synthesis of inflammation/oxidative stress mediators [2, 5 - 8].

### Mode of action of CoQ10

In humans, CoQ10/ Ubiquinone as it is ubiquitous in nature, is synthesized from the mevalonate cycle, obtained from acetyl CoA, which goes on to produce cholesterol, dolichol and CoQ10 as the final product [15].

CoQ 10 prevents membrane lipid peroxidation, apoptosis by inhibiting permeability transition pore (PTP) opening and mitochondrial membrane potential depolarization and it is required for the uncoupling proteins function. CoQ10 improves the oxygen consumption, ATP production and mitochondrial protein synthesis. In particular, CoQ10 may exert important cardiovascular protective properties in patients affected by renal failure [14].

### Mode of action of alpha lipoic acid (ALA)

Alpha lipoic acid is commonly found in vegetables and in meat, it is amphipathic in structure and ubiquitously distributed in several cellular structures. It acts as a cofactor for pyruvate dehydrogenase and alpha keto dehydrogenase complexes. It also neutralizes several free radicals, reducing the oxidized form of Vitamin C and glutathione, prevents the synthesis of free radicals by forming stable complex with the

catalyzers and limits the inflammation through the inhibition of NFkB. It also regulates the expression of several enzymes, regulators of glucose and lipid metabolism [9].

It is reported ALA decreases vascular calcification by reducing vascular smooth muscle cells apoptosis by preserving anti-oxidant mitochondrial functions. All these biochemical effects confer to this cofactor important antioxidant properties that can be exploited in CKD patients to slow down the progression of renal damage [10].

### Mode of action of omega 3 fatty acids/ seacod

Omega 3 are a family of polyunsaturated fatty acids (PUFAs), that play a major role in modulating the structure and function of the cell and organelle membranes. They exert anti-inflammatory functions by reducing the expression/production of adhesion molecules, chemotactic factors, pro-inflammatory cytokines. They also participate in membrane fluidity, ion channels transport and mitochondrial biogenesis. It is also known to have antioxidant properties [13].

### Mode of action of L-Carnitine

L - carnitine mainly derives from diet (75%) with bioavailability that ranges from 54-72% and it is synthesized endogenously from two essential amino acids: lysine and methionine. It mediates the transport of fatty acids across the mitochondrial inner membrane from the cytosol to the mitochondrial matrix for their  $\beta$ -oxidation. This leads to acetyl coenzyme A production that, entering tricarboxylic acid cycle, improves mitochondrial respiratory chain activity and reduces oxidative stress formation [12].

Additionally, L-Carnitine is able to directly reduce free radical generation by scavenging oxidative stress product and chelating iron and it may act as secondary antioxidant by increasing the production/ activity of antioxidant enzymes and by inhibiting lipid peroxidation and xanthine oxidase activity [11].

With the limited experience of this 9 patients we found within the course of 1-2 months the parameters reverse to normal in clinical, biochemical and sonological terms.

Table No.1 shows the case study of the patient who has undergone the treatment with AV fistula for the endstage renal failure with the KJs regime.

**Table 1: Blood Routine**

	Hb (gms/dl)	Urea (mg/dl)	Creatinine (mg/dl)	Sodium (mmol/L)	Potassium (mmol/L)
<b>Pre-Treatment</b>	10	60	3	135	4
<b>Post-Treatment</b>	11.5	37	1.5	141	3.1

Table 2: Urinary Profile

	Total volume (ml)	Sodium (meq/24hrs)	Creatinine Clearance (ml/min)	Protein (mg/dl) for 24 hrs	eGFR (ml/min/1.73m <sup>2</sup> )
Pre – Treatment	950	84	14	2850	22
Post - Treatment	2450	215	56	392	94

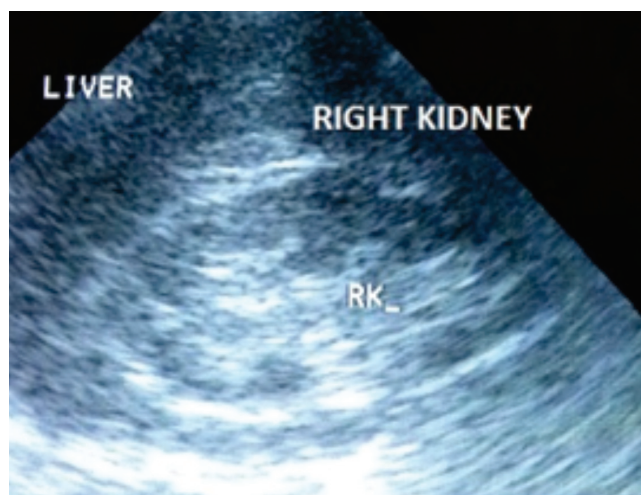


Figure 1: Sonogram of the patient before treatment

Other treatments can continue for Diabetes and cardiovascular conditions along with regimen.

## Results

Figure 1 and 2 clearly denotes the variation in echogenicity of the patient's Kidney.

Table 1 clearly denotes that the urinary and the biochemical profile has come back to normal reference values from the endstage renal failure.

Thus the biochemical, clinical and sonological results have been analysed post and pre treatment and it is seen that the end stage renal failure condition has been improved to normal functioning kidney.

The longest survivor is 10 years without dialysis or transplant. Since, most of the items are health supplements and non-toxic along with dialysis this regimen could be instituted. Now, in the larger series we are planning to joining hands with other institutions to make the study to open up for other patients. Our observation into Diabetic patients who had Peripheral Neuritis which got settled. A larger series has been started by our other MoU partners. Couple of them showed reversal of Fatty Liver also.

## Discussion

Even though this is a small series, it opens up a new modality of treating renal failure patients. May be



Figure 2 : Sonogram of the patient after treatment.

overcoming dialysis and transplant or it postpones the above two procedures to a substantial period. Since the side effects are very negligible, one patient complained of flatulence which got settled with anti-flatulent remedy. With this regime we found there is a reduction of 5-10 mm/Hg reduction in blood pressure of the patients.

## Conclusion

Larger series will definitely make the life of end stage renal failure patients to lead normal protective life without any intervention or surgery.

## Acknowledgement

This case study was supported by K. J. Hospital Pvt. Ltd. We thank our colleagues Dr. A. Govindan, Radiologist, Mrs. S. Jacquelin Bhagya Sheela, Mrs. Sherly, Staff nurses and Mr. M. P. Vikraman, Sonographer of K. J. Hospital who provided the insight and the reports and case sheets of the patients that greatly assisted the research.

<b>Conflict of interest:</b>	All authors declare no COI
<b>Ethics:</b>	There is no ethical violation as it is based on voluntary anonymous interviews
<b>Funding:</b>	No external funding
<b>Guarantor:</b>	Dr. K. Jagadeesan will act as guarantor of this article on behalf of all co-authors.

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