

# The Early Treatment of a Bodybuilder with Symptomatic Chronic Renal Failure with Intestinal Dialysis: A New Recommendation for Intestinal Dialysis Enhancement

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## Abstract

**Background:** Dietary therapy aiming primarily at reducing the generation and accumulation of urea through protein restriction is the most important non-dialytic therapeutic intervention in the management of chronic renal failure. The use of a urea lowering agent “acacia gum” with protein restriction has been increasingly used as a new form of dietary dialysis which has been increasingly known as intestinal dialysis. Just like in other forms of dialysis, the use of conservative dietary and pharmacological measures is also necessary in intestinal dialysis.

**Patients and methods:** The early treatment of a bodybuilder with symptomatic chronic renal failure with intestinal dialysis is described, and the relevant literatures were reviewed with the primary of identifying the evidence that can contribute to enhancing intestinal dialysis.

**Results:** At about the age of 50 years (March, 2022), a professional bodybuilder who presented with progressive symptomatic uremia associated with nausea, vomiting, pruritus, and mild anemia. His weight was about 100 Kg, and before his current illness he reported that his bench press single maximum repetition was 140Kg. On the 19th of March, blood urea level was 162 mg /dL and serum creatinine was 6.2 mg /dL. Renal ultrasound confirmed the chronicity of renal failure and showed small kidneys. The conservative dietary (Acacia gum supplementation plus very low protein diet) and pharmacological managements were prescribed according to the latest published intestinal dialysis guidelines and included oral iron and folic acid capsule, and calcium carbonate. After two weeks, the patient was asymptomatic and blood urea was lowered to 126.4 mg/dL, and the hemoglobin was increased to 11g/d.

**Conclusion:** This is just another case to demonstrate that intestinal dialysis is effective in lowering blood urea level and improving symptoms in symptomatic chronic renal failure. There is a convincing evidence to support that the addition of essential amino acids and ketoanalogues in the management of chronic renal failure with intestinal dialysis can contribute to its enhancement.

**Keywords:** Symptomatic uremia; Intestinal dialysis; Ketoanalogues of essential amino acids.

## Introduction

Dietary therapy aiming primarily at reducing the generation and accumulation of urea through protein restriction is the most important non-dialytic therapeutic intervention in the management of chronic renal failure. The use of a urea lowering agent “acacia gum” with protein restriction has been increasingly used as a new form of dietary dialysis which has been increasingly

known as intestinal dialysis. Just like in other forms of dialysis, the use of conservative dietary and pharmacological measures is also necessary in intestinal dialysis [1-14].

## Patients and methods

The early treatment of a bodybuilder with symptomatic chronic renal failure with intestinal dialysis is described, and the relevant

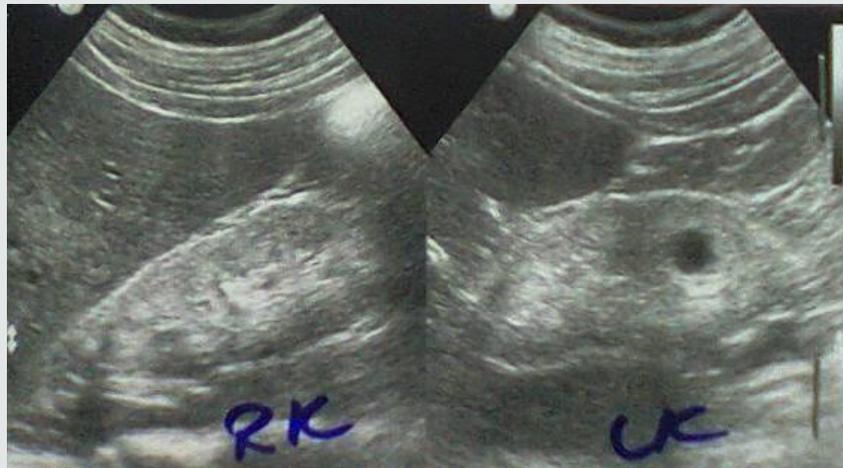
literatures were reviewed with the primary of identifying the evidence that can contribute to enhancing intestinal dialysis.

## Results

At about the age of 50 years (March, 2022), a professional bodybuilder who presented with progressive symptomatic uremia associated with nausea, vomiting, pruritus, and mild anemia. He was not having reduction in urine output, edema or hypertension. His weight was about 100 Kg, and before his current illness he reported that his bench press single maximum repetition was 140Kg. On the 19th of March, blood urea level was 162 mg /dL and serum creatinine was 6.2 mg /dL. Urinalysis showed 2 plus albuminuria and one plus amorphous urate. Blood calcium and serum electrolytes were within normal ranges, but he had mild hyperphosphatemia with serum phosphorus of 4.9 mg/dL (Normal range 2.4-4.4mg/dL). Hemoglobin was 10.7 mg/dL (Normal ranges: 11.5-16.5 g/dL). Liver function tests were normal (Total serum bilirubin 0.8 mg/dL, Aspartate aminotransferase (SGOT) 25 iu/L, alanine aminotransferase (SPOT) 21 iu/L, alkaline phosphatase 284 iu/L).

He reported history of episodes of hyperglycemia that in the case of bodybuilders is generally attributed to growth hormone administration in excessive doses. However, the patient was reluctant to provide details about the performance enhancing medications such as anabolic steroids and growth hormone, and he

was not confirming or denying the use of such agent. He was simply saying that he was taking protein supplements. Renal ultrasound (Figure 1) confirmed the chronicity of renal failure and showed small kidneys (RK: 8 x 4, cortex 6 mm, LK: 8.2 x 4, cortex 6 mm). The kidneys had hyper-echoic texture with reduced cortical thickness and loss of the cortico-medullary differentiation. There were small cysts on both kidneys, not more than 1.5 cm in diameter. Abdominal ultrasound also showed small polyp in the gall bladder and mild enlargement of the prostate with a volume of 27 cm<sup>3</sup> (Normally up to 25). The patient initially required oral prochlorperazine 5 mg for two days control the nausea and vomiting, and oral antihistamine plus topical crotamiton 10% to control pruritus. The conservative dietary (Acacia gum supplementation plus very low protein diet) and pharmacological managements were prescribed according to the latest published intestinal dialysis guidelines and included oral iron and folic acid capsule, and calcium carbonate. He also received oral finasteride 5 mg daily for the prostatic enlargement. After two weeks, the patient was asymptomatic and blood urea was lowered to 126.4 mg/dL and the hemoglobin was increased to 11g/d. Ultrasound showed normal prostate size of 20 cm<sup>3</sup>. Literature review suggested that the addition of essential amino acids and ketoanalogues in the management of chronic renal failure with intestinal dialysis can contribute to its enhancement. Therefore, Ketosteril (Fresenius), was prescribed in a low initial dose of three tablets, and was ordered to be brought to the patient from Turkey.



**Figure 1:** Renal ultrasound confirmed the chronicity of renal failure and showed small kidneys.

## Discussion

Until now, there is no evidence to support that high protein diet per se can cause chronic renal failure. However, nephrocalcinosis caused exogenous vitamin D intoxication was reported to cause renal failure in a bodybuilder athlete [15]. Therefore, an accurate causation of the chronic renal failure cannot be determined. Carrero et al (2020) emphasized the importance and benefits of fruits and

vegetables in patients with chronic renal failure. The intake of fruits and vegetables is associated with a higher fiber intake which can cause a shift in the gut microbiota towards reduced production of uremic toxins. The intake of fruits and vegetables is also associated with lower intake phosphorus, and thus help in controlling hyperphosphataemia [16]. However, the latest published intestinal dialysis guidelines have already suggested intake of fruits and

vegetables [17]. The use of Keto-analogues of essential amino acids in the management of chronic renal failure has been reported as early as the 1970s (Walser, 1978; Bauerdick and colleagues, 1978, Giovannetti et al, 1980) [18]. Bauerdick and colleagues (1978) reported the use of nitrogen-free hydroxy and keto precursors of amino acids in the treatment of patients with chronic renal failure with essential amino acid and a low-protein diet was associated with a more positive nitrogen balance [19]. In 1980, Giovannetti et al treated twenty patients with advanced chronic renal failure with a low protein diet (0.2 g/kg/day hour vegetable proteins) and essential aminoacids and ketoanalogues. They reported that treatment was associated with a favorable outcome [20]. In 1981, Barsotti et al emphasized that treatment of chronic renal failure a very low protein diet plus essential amino acids and ketoanalogues is not associated with reduction of creatinine clearance, while treatment with hemodialysis and free protein intake is associated with reduction of creatinine clearance. They treated thirty-one patients with a conventional low-protein diet, and treatment was associated with a linear reduction of creatinine clearance. A thirteen patient treated with hemodialysis experienced significantly accelerated decline of creatinine clearance. However, only one of a twelve patients treated with a very low protein diet supplemented plus essential amino acids and ketoanalogues, experienced continued a continued reduction in creatinine clearance [21].

Mitch and colleagues (1982) described the treatment of 9 patients who severe chronic renal failure (mean glomerular filtration rate 4.8 ml/min; mean serum creatinine 11.3 mg/dl). They were treated with protein restriction (22.5 g daily of mixed quality protein) plus essential amino acids and keto-analogues of essential amino acids including tyrosine, ornithine, and a high proportion of branched-chain ketoacids, and very little methionine. Phenylalanine and tryptophan were not provided. One month of treatment was associated with significant lowering of serum urea nitrogen. Hyperphosphatemia which was observed in three patients, improved. Treatment was not associated with side effects. The treatment precluded the need for dialysis in patients with severe chronic renal failure who would otherwise need dialysis [22]. In 1983, Barsotti et al described the treatment of 48 patients with chronic uraemia for a maximum of 36 months with low protein diet plus essential amino acids and keto-analogues. Ten patients experienced reduction of renal function and required dialysis.

Eight patients experienced difficulties in complying with treatment and also required dialysis. Three died for causes that are not directly related to renal failure. 27 patients continued with treatment without important reduction in renal function, and enjoyed satisfactory subjective and objective states without evidence of protein malnutrition or unwanted effects [23]. In 1985, Barsotti et al reported that the treatment of men who had uremia with a low protein diet plus essential amino acids and ketoanalogues was associated with restoration of testosterone levels in blood [24]. In 1985, Ciardella et al described the treatment

of eighty-five patients with chronic renal failure with a vegetarian low-protein, low-phosphorus diet plus essential amino acids and ketoanalogues. Treatment was associated with marked reduction of serum triglycerides in the 61 men, but the reduction was not significant in woman. When the patients were later treated by maintenance hemodialysis without dietary restrictions, the experienced elevations in serum triglycerides levels which was attributed to the loss of the effect of the dietary restriction on uremic male hypogonadism [25].

## Conclusion

This is just another case to demonstrate that intestinal dialysis is effective in lowering blood urea level and improving symptoms in symptomatic chronic renal failure. There is a convincing evidence to support that the addition of essential amino acids and ketoanalogues in the management of chronic renal failure with intestinal dialysis can contribute to its enhancement.

## Conflict of interest

None.

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