Interview with Rehan Jalali, President,
Supplement Research Foundation

Author of:
'The Six-Pack Diet Plan: The Secrets to Getting Lean Abs and a Rock-Hard Body Permanently'

Background Information:

According the National Kidney Foundation/and Urology databases of 2003- 2004, Chronic Kidney Disease (CKD) afflicts 20 million in the U.S. and an estimated additional 10 - 15 million persons globally. In the U.S., there is presently approximately 1.7M classified as 'pre-dialysis'(stage 4), and >380,000 currently dialyzing (stage 5).

Research strongly suggests that a heavy meat diet hastens the decline of renal function in those with confirmed CKD. Reasons for such decline are multi-factorial. In individuals with normal kidney function, serum values for meat-generated creatinine have been shown to remain mildly elevated for up to 10 hrs postprandial with no confirmed negative consequences.

The nutritional supplement creatine monohydrate supplies a generous helping of (primarily) creatine. Research has shown that excess creatine (beyond what the body's physiology can utilize or store) is 'dumped', unconverted, into the urine. Concomitantly, serum creatinine rises only modestly, while urinary creatine and creatinine are elevated. Serum creatinine (and creatine) excesses, arising from chronic ingestion of large gram doses of the supplement (10-30 g), may remain mildly elevated (after discontinuation) for several days. In those with normal kidney function, these excesses are eventually cleared via the kidneys-urine route. However

in individuals with moderately diminished renal function, these excesses of creatinine (and creatine in the case of the supplement), can take much longer to clear.

Question: Considering the number of persons with CKD today, could you comment on the safety of meat and supplement creatine consumption in individuals with pre-existing kidney disease ,as it relates to the generation of excess creatinine?

Reply: Individuals with pre-existing kidney disease may have a harder time handling excess creatinine production as a result of creatine supplementation. There have been over 500 published studies on creatine supplementation and none show any clinically significant side effects in training individuals. But since these are generally healthy people, the effects of creatine supplementation on training individuals with compromised renal function has not been investigated in depth over the long term. It can however be theorized that they may have a harder time handling the excess creatinine that may be produced. Again, more research needs to be done to conclusively prove this notion.

Question: Could you elaborate on anything you feel is relevant (e.g. creatine's mechanism of action, and potential impact) in persons with confirmed kidney disease?

Reply: The mechanism of action of creatine – once it enters the muscle cell, is it's conversion into creatine phosphate by the enzyme creatine kinase. Once used, the creatine molecule is converted into creatinine and excreted as a waste product. This can tax the kidneys of individuals with confirmed kidney disease. Plus, creatine seems to cause increased water retention inside muscle cells. This is great for normal (renal function) training individuals, but may be a problem for people with kidney disease.

Question: What, if any, "bio-burden" do you believe is being imposed on the body by such protracted creatinine elevation?

Reply: In normal individuals, several safety studies on creatine supplementation have shown no adverse effects to the kidney or liver.

Question: Do you believe that a protracted creatinine excess could *potentially* lead to the 'Domino Effect' (i.e. One problem compounding, or initiating, another)?

Reply: In people with kidney disease, this 'Domino Effect' could theoretically occur due to the abnormal excretion of excess creatinine. Since creatinine is a waste product, its excess accumulation could lead to toxicity in the body including pH imbalance.

Question: Do you believe the nutritional supplement, creatine monohydrate, could negatively impact the kidney?

Reply: In normal healthy training individuals, I believe that, based on the research, it is very safe and effective. In non-training people with kidney disease, it may be a problem because it causes the kidneys to work slightly harder to handle the creatinine byproduct load.

Question: What role do you believe creatine monohydrate may play in the progression of pre-existing CKD or renal failure?

Reply: I'm not sure there is clear clinical evidence to suggest that creatine monohydrate supplementation causes a progression of pre-existing CKD or renal failure. There is

research evidence to suggest otherwise, i.e. that it is safe. But theoretically, I can say I don't believe creatine supplementation will make this disorder better.

Question: In CKD, where do you believe excess creatinine (and *excess* creatine) may exert its *potential* negative influence?

Reply: Based on mechanism of action, I would think it would most likely effect the nephron.

Question: Do you believe that this supplement can or can not be used safely by someone with CKD or ESRD?

Reply: I would not recommend it because there is just not enough research on this group safely using it. It also depends if this group is training or not, since training allows creatine to be used much more effectively.

Contact Information:
Rehan Jalali
President
Supplement Research Foundation
www.Tsrf.Com

An interview with Dr. Kamen Stoychev, MD
Assistant Director -- Dr. I.S. Greenberg Medical Center

Questions: Could a chronic physiological excess of creatinine (generated from continual creatine monohydrate use), pose a potential metabolic or renal burden to those with pre-existing renal disease? **AND:**

Could a chronic physiological excess of said creatinine be involved in a worsening of pre-existing kidney disease?

Reply: In order to understand the risks associated with high levels of creatinine in the blood,

one must first understand the role of creatinine, as an indicator of renal function, and its place

in our metabolism as a waste product. It's concentration in the blood is indicative of the kidney's health (given that the individual is not ingesting excessive amounts of meat or creatine monohydrate for months). Our creatinine level is maintained within physiologically normal limits due to the process of filtration through the basal glomerular membrane. The glomeruls are the kidney's waste purification plants. Filtration is a process, which does not require energy, and its speed is proportional to the concentration of the waste product in the blood. However, its speed is limited by the permeability of the basal membrane. In other words, if the level of creatinine in the blood exceeds certain values, the basal

membrane becomes inadequate as the only mechanism for eliminating creatinine from the body. If this happens, a second mechanism is activated, which aids the kidney in its endeavor to eliminate creatinine from the body. This mechanism is a type of active

transport, since it requires energy, and it is performed by another piece of 'equipment' inside the kidney – the so called proximal tubule. This second mechanism activates as soon as the creatinine levels rise above certain values. The intake of large amounts of proteins, or creatine monohydrate, for prolonged periods of time (three weeks or more),

can be the reason for a rise of creatinine levels in the blood. Another reason for such a rise could be any one of a number of kidney diseases, any of which would cause a decrease in the

ability of the kidney to eliminate toxic waste products from the body. An especially dangerous combination could be the intake of large quantities of creatine – such as occurs in the consumption of an Atkins diet (***a heavy meat-rich diet)***, or excessive supplementation with creatine monohydrate, by someone with an underlying kidney disease state involving the basal glomerular membrane (such as collagenosis, IgA nephritis or nephritis). Often such conditions are "silent" for many years. Creatinine overload – due to diet, can act as the 'ultimate stress', trigger a decline which can lead to rapid renal deterioration, proceeding all the way to renal failure and need for dialysis or kidney transplantation. Another very common condition, especially among women, is the inflammation of the kidneys

due to microbial infections – the so called 'nephritis'. This nephritis often involves the tubules and can cause tubular insufficiency. This, in combination with large dietary intakes of excessive creatine, can also lead to renal failure. Just like with any other substance (including the very air we breath), the intake of excessive amounts of creatine

are toxic, and can cause harm, while the intake of physiological amounts of creatine can be beneficial.

Dr. Kamen Stoychev, MD
Assistant Director
Dr. I.S. Greenberg Medical Center
Sofia, Bulgaria
kamenst@techno-link.com>