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The Effects of VP2 Whey Isolate and Micronized Creatine Supplementation on Strength and Fatigability in Rat Skeletal Muscle

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Athletes from a variety of sports desire an increase in muscle mass, and strength. This study examined the effects of VP2 Whey Isolate and Micronized creatine supplementation on force production and fatigue in whole muscle fibers.

METHODS: Female Sprague-Dawley rats were randomly separated into 3 groups: 1) control (n=10), 2) creatine supplemented (n=8), and 3) VP2 supplemented (n=8). The rats were fed normal or supplemented chow for a period of 6 weeks. After the supplementation period, the animals were anaesthetized and both the fast-twitch muscle - the extensor digitorum longus (EDL) and the slow-twitch muscle - the soleus were removed and tested.

RESULTS: Muscle taken from rats supplemented with Micronized creatine and VP2 Whey Isolate generated highly significant absolute and specific forces ($P < 0.001$). The improvements in force production caused by supplementation were witnessed in both the EDL (fast-twitch) and soleus (slow-twitch) muscles. Furthermore, animals treated with micronized creatine exhibited a 17% improvement in fatigue recovery in the EDL muscle. Supplementation with Micronized creatine also increased the percentage of type-2a fibers in the soleus muscle compared to controls ($P < 0.05$).

Fast-twitch muscle is utilized during explosive, power-based movements. Slow-twitch muscles are utilized predominantly during endurance exercise. The major finding of this investigation was that supplementation with either VP2 Whey Isolate or Micronized Creatine significantly increased muscle force output in fast-twitch and slow-twitch muscle. Micronized creatine supplementation also improved recovery in fast-twitch muscle. These benefits were witnessed without the influence of exercise training.

CONCLUSIONS: Supplementation with VP2 Whey Isolate and Micronized creatine appears to enhance force production in both muscle fiber types. Therefore, these nutritional supplements show the potential to enhance work capacity in short term exercise requiring strength and explosive power, as well as longer duration exercise.

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