DECLARATION

I, Frans Hendrik Badenhorst, declare that this dissertation is my own work. It is being submitted for the degree of Master of Science in Medicine in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University

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FH Badenhorst

_____ day of _____ , 2005

To my father Frans, mother Annalie and brothers Mias, Francois, Darius and Andre, whose support and encouragement lifted me when times were hard.

And to Antonei, whose love carried me when I was tired and inspired me to be the best I can be.

ABSTRACT

Creatine is one of the most frequently or generally used ergogenic substances. It is used by professional and amateur athletes and the "man on the street". Creatine is involved in energy production and protein synthesis in muscle. Although studies have been carried out on the effect of creatine on adults, no study has yet determined whether creatine would have an influence on the developing rat foetus if taken by a female during pregnancy.

The aim of this study was thus to determine whether creatine had an effect on the developing foetus.

Dams were divided into two groups, which were injected between days 7-13 and on days 9 and 11 only of intra-uterine development respectively. Each group was subdivided into a control and two experimental groups. Experimental group one received a low dose of creatine (53.5mg/250g body weight); the other experimental group received a high dose of creatine (107mg/250g body weight). The control group received an equal volume (1ml) of the vehicle (saline) in which the creatine was constituted. Dams were sacrificed on day 20 of development. The foetuses were removed and their weight and length taken. Foetuses were examined for abnormalities. Two foetuses from each litter underwent skeletal staining. Tissue was excised from the remaining foetuses and processed for histology for histological investigation.

Creatine positively affected the growth of the foetuses of dams injected between days 7-13, while foetuses of dams injected only on days 9 and 11 in the B-group showed reduced growth. Creatine also had a slightly negative effect on the histological structure of the liver, but enhanced skeletal muscle growth, endocrine cell formation (pancreas) and skeletal formation.

From the results obtained it is hypothesized that creatine and insulin together may play a positive role from implantation to birth, while creatine given at certain stages of organogenesis delayed development of the foetus.

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