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Kesan Palm ViteE Ke Atas Tikus Hamil Dan Perkembangan Fetusnya (The Effect Of Palm ViteE On Pregnant Rat And Fetal Development)

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Abstract

Palm ViteE, an extract from palm oil containing a high amount of tocotrienol [1], has been shown to have no toxicological effects when fed to young albino mice and *Sprague Dawley* rats within the range of 250mg/kg body weight (b.w.) to 2500mg/kg b.w tocotrienol [2]. However, thus far there has been no report of toxicological evaluation of tocotrienol intake on postnatal development in rats. The present study, therefore, was undertaken to investigate the effect of Palm ViteE on newborn rats following maternal feeding with various doses of Palm ViteE.

Pregnant *Sprague Dawley* females (190-230g) were fed with different doses (control, 100mg/kg b.w., 250mg/kg b.w., 1000mg/kg b.w.) of Palm ViteE by using an esophageal tube throughout the gestational period (21-22 days). After delivery, the number of pups per litter, pups' body weight, and their gross body parameters (crown rump length, head circumference) were observed.

The study showed that feeding of Palm ViteE did not alter the number of pups delivered and their body weight. Also there were no differences in the body parameters in the treated groups compared to that of control group.

Hence, the present study showed that Palm ViteE (100mg/kg b.w., 250mg/kg b.w., 1000mg/kg b.w.) did not retard the growth and development of the newborn rats. Thus, maternal intake of Palm ViteE by normal pregnant rats may have no adverse affects during the postnatal development.

1.0 Introduction

Palm ViteE is an extract of palm oil consisting of 25% tocopherol and 75% mixed tocotrienol [1]. A previous study found that the feeding of high doses of Palm ViteE between the ranges of 250-2500mg/kg b.w. did not produce toxicological effects to neonatal mice and

Sprague Dawley rats [2]. A previous study suggested that a dose of 60mg/kg b.w. Palm ViteE did not influence the length of gestational period and the number of pups born [3].

However, thus far there has been no report of toxicological evaluation on antenatal tocotrienol intake on postnatal development in rats. The present study, therefore, was undertaken to investigate the effect of Palm ViteE on newborn rats following maternal feeding with different doses of Palm ViteE.

2.0 Materials And Method

In this study, *Sprague Dawley* females rats (190-230g) were divided into four groups: N=control (n=7), A=dose 100mg/kg b.w. (n=9), B=dose 250mg/kg b.w. (n=8) and C=dose 1000mg/kg b.w. (n=10) and mated with proven fertile males. The presence of mucus plug indicated that the rats have been mated and the day at which the mucus plug was detected was considered as Day 1 of gestation.

The rats were fed orally with Palm ViteE by using an esophageal tube throughout the gestation period. After delivery, the number of pups born were counted and weighed.

Abnormalities were looked for up to postnatal day 7 (PD7) and body parameters such as crown rump length (CRL) and head circumference were measured at PD3 and PD7.

3.0 Results And Discussion

The study showed there was no difference in the number of pups delivered by rats between groups A (9.667 \pm 0.726), B (8.125 \pm 1.043), C (8.400 \pm 2.656) compared to that of group N (9.571 \pm 0.948). Therefore administration of all experimental doses of Palm ViteE did not affect the number of pups delivered. From the result, it is suggested that the doses of Palm ViteE did not affect the embryos' development or implantation process during the gestation period. A previous study has reported a similar finding where the administration of Palm ViteE at 60mg/kg b.w. did not have negative effects on rat embryos and did not influence the number of pups delivered [4]. A further study on fetal development during the gestation period will verify this result.

There was no difference in body weight at PD3 of group A (8.883 \pm 0.249g), B (8.284 \pm 0.229g) and C (8.1243 \pm 0.1953g) compared to that of group N (8.512 \pm 0.2544g). There was also no difference in body weight at PD7 of group A (13.803 \pm 0.401g), B (13.863 \pm 0.768g) and C (14.0927 \pm 0.3259g) compared to that of group N (14.857 \pm 0.360g). Thus, feeding of Palm ViteE did not influence the body weight of pups delivered. A previous study, investigating the intake of vitamin E during rat gestation period revealed that vitamin E (tocopherol) (22.5 to 2252mg/kg per day) did not influence the body weight of pups delivered [5].

No abnormalities were detected in the newborn rats for all treatment groups. The results showed that there was no difference in CRL at PD3 of group A (50.667 \pm 0.782mm), B (49.615 \pm 0.417mm) and C (51.320 \pm 0.500mm) compared to that of group N (49.580 \pm 0.480mm). Similarly at PD7, there was no difference in CRL of group A (58.583 \pm 0.917mm), B (59.429 \pm 0.297mm) and C (59.778 \pm 0.535mm) pups compared to that of group N (59.500 \pm 0.435mm).

The pups head circumference at PD3 of group A (48.111 ± 1.711mm), B (49.231 ± 0.343mm) and C (48.546 ± 0.283mm) was similar to that of group N (48.400 ± 0.471mm). At PD7 the head circumference has increased to 58.417 ± 0.821mm (group A), 58.143 ± 0.911mm (group B) and 57.444 ± 0.377mm (group C) while that of group N was 56.250 (± 0.800)mm. However, the difference in the head circumference at PD7 of group A, B and C when compared to group N was not significant.

The present study showed that feeding of Palm ViteE (100mg/kg b.w., 250mg/kg b.w., 1000mg/kg b.w.) did not adversely affect or cause abnormalities in the offspring. Observation of the head circumference and the crown rump length of the pups showed no significant differences in the above parameters between treated groups and the control group. Furthermore all the pups born from both control and the treated group did not show any abnormalities. Therefore the study suggested that doses of 100mg/kg b.w., 250mg/kg b.w., and 1000mg/kg b.w. of Palm ViteE may not affect the fetal and postnatal development of *Sprague Dawley* rats. A previous study has reported that feeding of an excess dose of vitamin E (tocopherol) (22.5 to 2252mg/kg per day) did not result in any teratogenic effect on the offspring [5].

4.0 Conclusion

The administration of Palm ViteE at 100mg/kg b.w., 250mg/kg b.w. and 1000mg/kg b.w. did not influence the number of pups delivered and their body weight, and did not retard the growth and development of the newborn *Sprague Dawley* rats. Also maternal intake of Palm ViteE as high as 1000mg/kg b.w. by normal pregnant rats may have no adverse effects on pups postnatal development.

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6.0 References

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