Open access Journal International Journal of Emerging Trends in Science and Technology

Clinical Observation of Toxicological Pathology of Vegetable oil in White Male Rats

Authors
Majeed Saleh. K[1], Batool S. Hamza[2], Hassan Mohammed A.A.[3], Al-Sereah Bahaa. A[4]
[1]55 Desborough Road, Hartford- Huntingdom, Cambridgeshire, PE 29 1 SN, England
Email: *Salehmajeed1940@yahoo.co.uk*
[2]Dep. of Pathology & Poultry Diseases, College of Veterinary Medicine, Univ. of Basrah, Iraq
[3]Dep. of Pathology & Poultry Diseases, College of Veterinary Medicine, Univ. of Basrah, Iraq
Email: *mohmmedn10@yahoo.com*
[4]Dep. of Pathology & Poultry Diseases, College of Veterinary Medicine, Univ. of Basrah, Iraq
Email: *bahaa_bkf@yahoo.com*

Abstract
Sixty white male rats (Sprague dawelly) were divided into two groups, 20 untreated control male rats feed on normal diet as group one while 40 treated male rats feed solely on vegetable oil for six months both young and adult showed varying degrees of emaciation associated with poor condition some with half closed eyes and all showed varying degrees of roughness of hair, piloerection, greasy of hair, loss of weight and some of the animals died during the experiment especially young ones.
Keywords: *vegetable oil, clinical, rat.*

Introduction

Nutritional and short term toxicological evaluation of Perilla seed oil by[1]. Effect of four different oils(red palm olein, palm olein, corn oil, coconut oil) on anti oxidant enzymes activity of rat liver by [2]. Vegetable oil high in phytosterols make erythrocytes less deformable and shorten the life span of stroke-prone spontaneously hypertensive rats were studied by [3]. Behavioral and reproductive effects of chronic developmental exposure to brominated vegetable oil in rat by [4].[5] studied the toxic effects of brominated vegetable oils in rats, males and females with different grades brominated corn, cottonseed, olive or sesame oil for 105 day. The toxicity of brominated sesame oil and brominated soybean oil in miniature swine by [6].[7] reported toxicological effects induced by the chronic intake of brominated vegetable oils for 105 day which gave 0.5g per 100g of diet(olive and sunflower).[8] reported dietary high linoleate sa.ower oil is not hypocholesterimic in aged mice after a long term feeding-comparisonwith lard, Perilla oil and fish oil.[9] investigated fatty acids in health and disease. [10] studied the Linolenate-derived polyunsaturated fatty acid andprevention of atherosclerosis. The efects of corn oil on theamount of cholesterol and the excretion of sterols in the rat by [11]. [12] studied Fish oil consumption and decreased risk of cardiovascular disease: a comparison of findings from animal and human feeding trials. [13] reported effectof n-3 fatty acids on lipid metabolism. Dietary requirements and functions of a linolenic acid in animals studied by [14].[15] studied dietary a-linolenic acid in man. In the purpose of the research to open the door for further research on toxicity of vegetable oil especially as its used widlely for humen consumption and in animals feed.

Material sand Methods

Sixten male white rats (Sprague dawelly) were divided into 2 groups, bought from animal house of basrah veterinary medicine college, university of basrah, Iraq and the experiment was done in the

animal house of veterinary medicine college. Group one consist of 20 young adult male rats feed only on normal diet (rat pellets) as untreated control. Second group of 40 young and adult male rats feed solely on vegetable oil for six months as the period of the experiment. Some animals died during the experiment and the rest were sacrifised at the end of six months.

Results

The study of toxicologic pathology of vegetable oils was done on 2 groups, untreated control which showed normal healthy rats with normal skin as in fig. 1and 2. The treated group consisted of 40 young and adult rats which showed varying severity of toxicological pathological changes characterized by emaciation, poor condition, piloerection, rough and greasy hair was shown in fig. 3 to 10. Some of the figures showed treated animals in cages will the vegetable oil container.

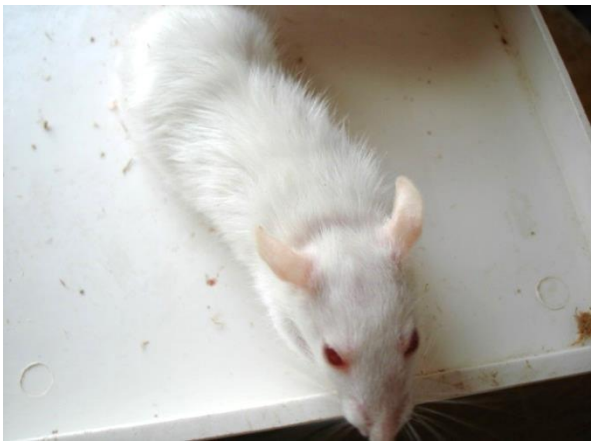

Fig.1: Control/ normal skin, healthy adult rat.

Fig.2: Control/ normal skin, healthy adult rat.

Fig.3: Tow rats treated with dietary vegatable oil note emaciation and greasy.

Fig.4: Three rats, 2 untreated young rats and Adult treated showing emaciation, roughness and greasyness of hair.

Fig.5: Tow treated rats in a cage with vegetable oil in container, note greasyness and roughness of hair.

Fig.6: Treated young rat with severe emaciation and prominent piloerection and greasyness of hair.

Fig.7: Treated rats note presence of dietary vegatable oil in food container, presence of the top of the cage with piloerection and greasyness of hair.

Fig.8: Young rat with emaciation and rough hair, poor condition half closed eyes.

Fig.9: Young rat with emaciation and greasy hair, poor condition.

Fig.10: Young rat with greasy hair, emaciation.

Discussion

The present research topic was done on toxicologica pathology of vegetable oil which was used by humen population in iraq for consumption with the idea to find out if there is any possibility of treatment related toxicity, locally we found male rats of spraguedawelly is the best model to study any toxicological pathology changes induced by the vegetable oils. [1] did a study on rat by feeding 10% perilla seed oil in diet of wester rats but did not showed toxicological effect, while in the present paper feeding of moderates solely and vegetable oil caused severe toxicological pathological effect characterized by emaciation, roughness and greasyness of hair with poor condition and some animal diet during the experiment. [2] studied only on antioxident enzyme and the effect of vegetable oils on the activites in the liver of male

spraguedawelly rats (1-2 month), the present study was done also on male rats on the same species but solely feed vegetable oil for six months. He only use 15% of the diet while we feed the rat solely on vegetable oil which could be cotton seed oil. [3] investigated the effect of vegetable oils on life span of stroke- prone spontaneously hypertensive rats, which they mentioned shorten the life span , the present research project also showed that feeding totally vegetable oil in diet could result in death and some animals male rat.[4] studied the behavioral and reproductive effect of chronic developmental exposure to brominated vegetable oil in adult spraguedawelly rats feed in low doses showed an effect of reproductive system, while the present study which was done on spraguedawelly male rats feed totally on vegetable oil showed for severe effect with emaciation and some death. [5] showed only minimal clinical changes at 0.5% of vegetable oils while the present study in male rats feed solely on vegetable oil for six month showed severe clinical signs with some death. [6] reported the toxicity of brominated soybean oil in miniature swine showed reduce growth red and food intake, lethargy and ataxia, in our study solely feed rats on vegetable oil showed severe emaciation, poor condition, piloerection, roughness and greasy hair even some death. [7] studied the toxicological effect of brominated vegetable oils for 105 days (olive and sunflower) showed minimal clinical signs which gave 0.5g/100g of diet while the present study with total feeding of vegetable oil to male rats for six months showed severe clinical signs of emaciation, rough and greasy hair and some death.

Recommendation

Its recommended that any vegetable oil intended for use humen consumption need to be tested on lab animals such as rats for there toxicity.

References

1. T. Longvah, Y.G. Deosthale and P. U. Kumar " Nutritional and short term toxicological evaluation of Perilla seed oil, " Food Chemistry, (70) pp. 13-16, 2000.
2. E. Dauqan, H.A. Sani, A. Abdullah and Z.M. Kasim "Effect of four different vegetable oils (red palm olein, palm olein, corn oil, coconut oil) on antioxidant enzymes activity of rat liver, " Pak J BiolSci, 14(6) pp. 399-403, 2011.
3. W.M. Ratnayake, M.R. Labbe, R. Mueller, S. Hayward, L. Plouffe, R. Hollywood andK. Trick "Vegetable oils high in phytosterols make erythrocytes less deformable and shorten the life span of strke-prone spontaneously hypertensive rats, "J Nutr, 130(5) pp. 1166-78,2000.
4. C.V.Vorhees, , R.E. Butcher, V. Woo, en and R.L. Brunner "Behavioral and reproductive effects of chronic developmental exposure to brominated vegetable oil in rats, "Teratology, 28(3) pp. 309-18,1983.
5. I.C. Munro,B. Hand, E.J. Middleton, H.A. Heggtveit, andH.C. Grice "Toxic effects of brominated vegetable oils in rats, "Toxicology and Applied Pharmacology, 22(3) pp. 432-439,1972.
6. D.C. Washington"The toxicity of brominated sesame oil and brominated soybean oil in miniature swine," Toxicology, 5(3) pp. 319-336,1976.
7. C. Bernal, M.Z. Basilico andY.B. Lombardo "Toxicological effects induced by the chronic intake of brominated vegetable oils," Arch LatinoamNutr, 36(3) pp. 432-442,1986.
8. A. Ishihara, A. Ito, K. Sakai, S. Watanabe, T. Kopayasiand H. Okuyama"Dietary high linoleate sa.ower oil is not hypocholesterimic in aged mice after a long term feeding-comparison with lard, Perilla oil and fish oil,"Biol Pharm Bull, 18(4) pp. 485- 490,1995.
9. P. Budowski"w-3 fatty acids in health and disease, "World Rev. Nutr Diet, (57) pp. 214-274, 1988.
10. J. Dyeberg"Linolenate-derived polyunsaturated fatty acid and prevention of atherosclerosis,"Nutr Rev, (44) pp. 125-134, 1986.
11. T. Gerson, T. B. Shorland and Y. Adams " The efects of corn oil on the amount of cholesterol and the excretion of sterols in the rat," Biochemistry Journal, (81) pp. 584-591, 1961.

12. P. Harold andJ. E. Kinsella"Fish oil consumption and decreased risk of cardiovascular disease: a comparison of findings from animal and human feeding trials," American Journal of Clinical Nutrition, (43) pp. 566,1986.
13. P. J. Nester " Efect of n-3 fatty acids on lipid metabolism, "Ann Rev Nutr, (10) pp. 149-167,1990.
14. Tinoco, J "Dietary requirements and functions of a-linolenic acid in animals, "Progress in Lipid Research,(21) pp. 1-45, 1982.
15. Zollner, N. " Dietary a-linolenic acid in man "Ð an overview Progress in Lipid Research, (25) pp. 177-180,1986.

Author Profile

HASSAN MOHAMMED A.A. Graduated from basrah veterinary medicine college in 2005 (BVMSc). from 2009-2011 working as postgraduate student doing (MSc) in PATHOLOGY. In 2014 working as postgraduate student doing (PhD) in PATHOLOGY in UPM UNIVERSITY in MALAYSIA. In 2011 working as assistant lecturer in Pathology Department in veterinary medicine college. From 2012 till present lecturer in department of pathology. From 2012 till present doing researches in pathology and toxicological pathology.