

Serum and Liver Lipids in Rats Treated with Neomycin. (25280)

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Samuel *et al.*(1) reported recently that oral administration of neomycin was associated with significant decrease in serum cholesterol concentration in ten patients studied. Neomycin, an antibiotic isolated from *Streptomyces fradiae* by Waksman and Lechevalier. (2), is effective *in vitro* and *in vivo* against a wide variety of bacteria including species resistant to other antibiotics(3). This antibiotic seems to have a large use in veterinarian medicine(4) and probably will gain in importance in handling the infections of laboratory animals in research institutions. The possible effect of neomycin on lipid metabolism of experimental animals may become, however, an undesirable complication in some studies. Because previous data on this subject concern only human material(1), it seemed interesting to investigate the effect of neomycin on lipids in various laboratory animals. This report deals with data on serum and liver lipids in rats fed during 4 months with normal diets and cholesterol rich diets, alone or with neomycin.

Method. Male Sprague-Dawley rats, weighing 172-187 g. were used. The basal control diet was a grain food of the following composition(5): ground yellow corn 68%; linseed oil meal 13%; powdered skim milk 15%; alfalfa leaf meal 2%; cod liver oil 1%; iodized table salt 0.5% and calcium phosphate 0.5%. Basal diet supplemented with 4% cholesterol in 5% of olive oil was called "cho-

lesterol diet." When basal diet or cholesterol diet was added with 0.2% neomycin (Mycifradin Sulphate, Upjohn Co.), the diets were called, respectively, "neomycin diet" and "neomycin + cholesterol diet." Dosage of neomycin was arbitrary. Samuel *et al.*(1) gave their patients 0.5 to 2 g of Mycifradin Sulphate daily. In our experiment a rat ingested approx. 30 mg daily of same preparation, which was a large intake as compared with dosage in humans. Total cholesterol of serum and liver was determined following the method of Abell *et al.*(6). For study of lipid phosphate samples were extracted with alcohol-ether and analysis carried out by the technic of Zilversmit and Davis(7).

Results. Tables I and II summarize data on the effect of various experimental diets, on lipid levels in serum and liver of rats. Despite the slight differences in average values noted between the 4 groups of animals, no marked effect of neomycin on phospholipids or total cholesterol levels in serum and liver was observed. Yet, in this study a relatively large dosage of neomycin was used over a prolonged period.

Samuel *et al.*(1), in their comment on post-neomycin hypocholesterolemia in man, mentioned the possibility that this effect might be due to changes in bacterial flora or certain enzyme systems of the gastro-intestinal tract. This might be true as far as the human subject is concerned. In rats, however, neomycin

TABLE I. Serum Lipids (mg/100 ml) in Rats after Feeding with Various Diets during 4 Month Period. Mean, S.D. and range.

Diet	No. of rats	Final body wt (g)	Total cholesterol	Phospholipids	C/P*
Normal control	20	345 ± 37 281-408	67 ± 17 36-104	130 ± 14 100-150	.52 ± .12 .25-.71
Neomycin	13	318 ± 31 272-395	83 ± 16 57-105	139 ± 22 108-183	.61 ± .15 .42-.81
Neomycin + cholesterol	19	314 ± 26 261-361	85 ± 25 42-145	160 ± 25 90-223	.56 ± .19 .22-1.01
Cholesterol	20	385 ± 31 349-427	110 ± 31 65-203	133 ± 26 103-195	.66 ± .90 .41-1.73

* Cholesterol/phospholipids ratio.

TABLE II. Liver Lipids (mg/100 g Wet Tissue) in Rats after Feeding with Various Diets during a 4 Month Period. Mean, S.D. and range.

Diet	No. of rats	Liver wt (g)	Total cholesterol	Phospholipids	C/P
Normal control	20	11.4 $\pm$ 1.8 8.3-14.1	252 $\pm$ 42 202-348	2849 $\pm$ 252 2440-3350	.09 $\pm$.02 .07-.16
Neomycin	15	10.1 $\pm$ 1.5 7.6-12.1	295 $\pm$ 45 225-321	2912 $\pm$ 218 2400-3398	.09 $\pm$.03 .08-.14
Neomycin + cholesterol	18	10.2 $\pm$ 1.3 7.6-12.8	1660 $\pm$ 350 1026-2333	3017 $\pm$ 388 2300-3725	.53 $\pm$.14 .36-.89
Cholesterol	20	15.0 $\pm$ 2.7 13.5-16.1	1676 $\pm$ 266 1260-2043	2880 $\pm$ 413 2020-3675	.61 $\pm$.13 .38-.95

did not influence lipid levels in serum and liver under the described experimental conditions.

It was believed for a long time that rats were resistant to induction of hyperlipemia and hypercholesterolemia. Recently, however, this opinion has been modified(8) and these animals are now frequently used for study of various dietary factors inducing atherosclerosis.

In our experiment no significant hypercholesterolemia was observed, despite the prolonged ingestion of cholesterol rich diet by rats.

The only significant change in this study was the rise of total cholesterol in livers of animals given cholesterol rich diets, with and without neomycin.

Summary. 1) Because ingestion of neomycin results in hypocholesterolemia in human subjects, the effect of this antibiotic on lipids of serum and liver has been studied in rats. 2) Basal control diet or cholesterol rich diet, alone or added with 0.2% neomycin, has been

fed to rats for 4 months. This prolonged administration of neomycin to rats was not associated with any significant changes in serum or liver levels of cholesterol and phospholipids.

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Comparison of Glutamic-Oxalacetic and Glutamic-Pyruvic Transaminase Concentrations in Human Saliva and Serum.* (25281)

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Since development of practical methods for in varying amounts in all body tissues and determination of glutamic-oxalacetic and glu-function in the transference of amino groups tamic-pyruvic transaminases, measurements from one amino acid to another. Increased of serum and cerebrospinal fluid concentra- tions of these enzymes have been used in dif- ferential diagnosis of an ever increasing list of disease states. These enzymes are present

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