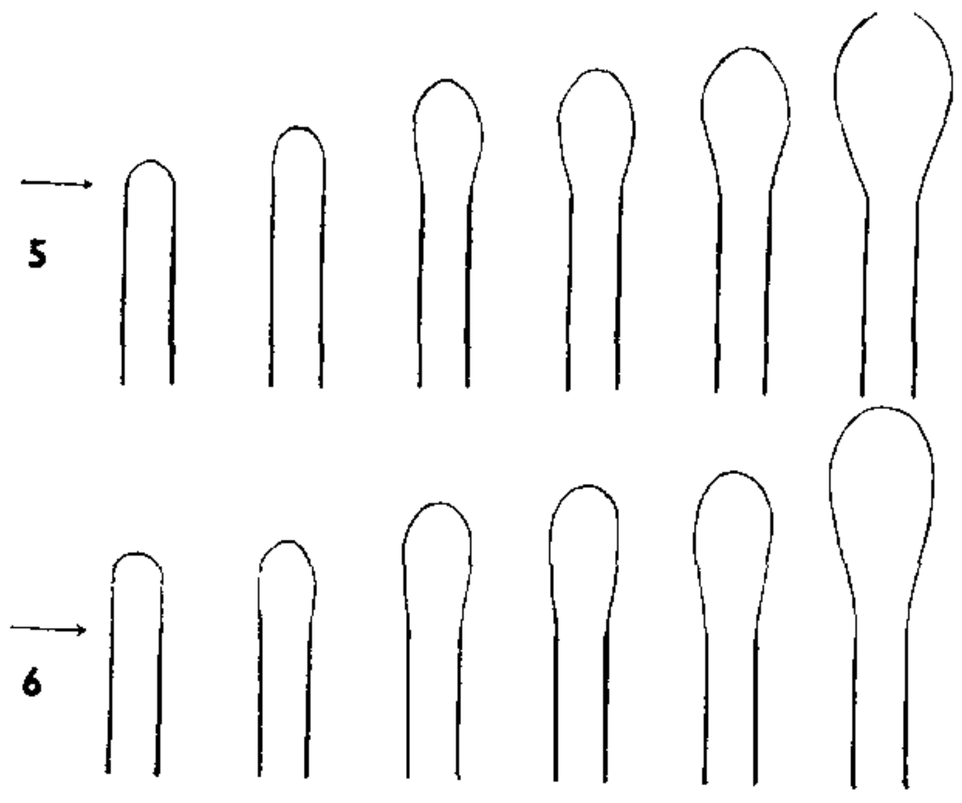
always present. If one makes a critical study of conidial ontogeny, in most cases it should, therefore, be possible to distinguish a blastospore from a gangliospore on the basis of the constriction between conidium and conidiophore which is present only in the case of the blastospore (Figs. 1-4) but not the gangliospore (Figs. 5-6); but, as stressed by Subramanian,[10] "the line between a blastospore and a gangliospore at maturity may be dubious" sometimes. This is because considerable variation in the width of this constriction can be seen and a graded series can be built up between the two extremes of a blastospore produced by the blowing out of a narrow zone of the conidiophore wall and the gangliospore formed by the swelling of an extensive zone of the conidiophore including its entire apex (Figs. 1-6), and if the width of the conidiophore producing conidia at its tip is relatively narrow, it would be difficult to state precisely to which of these two categories a conidium may be assigned.



FIGS. 5–6 illustrate development of gangliospors: a larger zone of the wall is extensible and gradually swells in the series in Fig. 6 than that in Fig. 5.

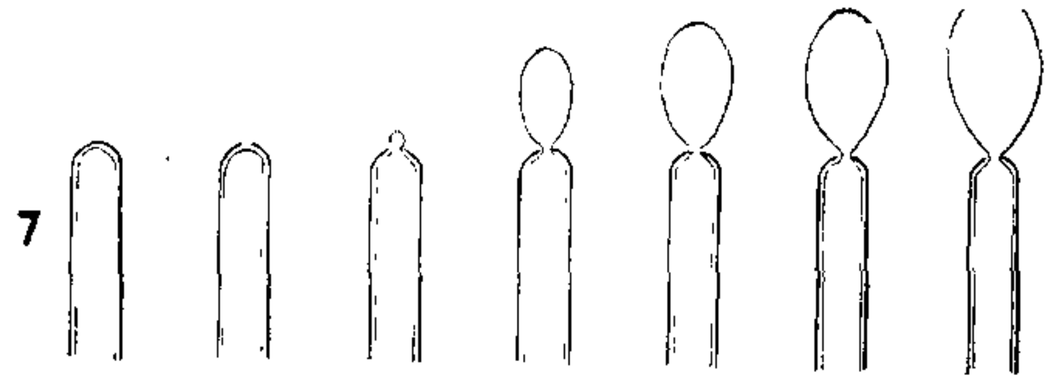


FIG. 7 illustrates the development of porospores in which a pore is formed on the conidiophore and an inner wall or wall-layer blows out through the pore and develops into a conidium. (Area or part of conidiophore wall above arrow extensible.)

The most significant point about the three patterns of development observed in the case of the *Drechslera* spp. investigated is the fact that, in the development of the porospore, the wall of the conidiophore, or its outer layer, according to interpretation, seems to contribute nothing to the wall of the developing conidium and the conidial wall seems to be the blown out of an extensible inner wall or wall-layer; on the other hand, in the development of the blastospore and the gangliospore, the wall as a whole, and not merely an inner layer, becomes extensible permitting the development of a bud in the case of the former and a generalized swelling in the case of the latter. I believe that closer scrutiny of relationship of wall or wall-layers in elucidating conidial ontogeny would contribute considerably to the correct interpretation of conidial types and a better understanding of conidial morphogenesis in imperfect fungi.

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CHOLESTEROL MOBILISING ACTIVITY OF TESTOSTERONE PROPIONATE

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IT is known that adrenaline administration causes a decrease in lipemia associated with elevation in the basic metabolism and a sensible increase in fat of the liver, particularly of the cholesterol esters. The thyroid also participates as an important regulator of the blood cholesterol level. Testosterone was found to mobilise unesterified fatty acids from the body fat stores, as demonstrated by increased level of serum fatty acids in female rats by Laron and Kowadlo.[1] They had injected 10 mg. of

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testosterone to starved female rats. Norcia and Evans[2] found resemblance between free fatty acids of plasma and of the triglycerides liberated from the adipose tissue. Former workers had concluded that the source of the increased free fatty acids in serum was adipose tissue, thus attributing the lipid-mobilising effect to testosterone.

A similar effect of testosterone propionate is further observed in the present investigation in relation to cholesterol. Excretion studies have shown that after intramuscular injection of testosterone propionate in oil, this hormone is completely eliminated from the body in a very short period.[3] Therefore, to ensure a moderately constant level of activity, the hormone was injected every day for a period of 15 days.

Methods and Materials

Adult male albino rats were used in the present investigation. Subcutaneous injection 0·5 mg./100 g. of body weight) of testosterone propionate in arachis oil† was given to each rat daily. Another group of control rats was maintained in similar conditions except for the administration of hormone. Access to food and water was free.

Fifteen days after the commencement of the injection, the rats were sacrificed and blood, liver and small intestine were collected. Serum was used for chemical analysis. Lipids were extracted by the Soxlet extraction method using chloroform : methanol (2 : 1) mixture. This lipid extract was concentrated under vacuum at 37° C. and later subjected to adsorption chromatography using an activated alumina column, as described elsewhere,[4] for the separation of free and esterified cholesterol. The esterified cholesterol fraction was saponified and then extracted with redistilled petroleum ether (60-80° C.). Both these fractions were precipitated with digitonine. The digitonide complex was dissolved in 2 ml. of glacial acetic acid. To this, 4 ml. of a mixture consisting of 5% sulphuric acid in acetic anhydride was added. The colour was developed by keeping the tubes in a closed water-bath at 30° C. for 30 minutes. Optical density was read with the help of "Spectronic 20" (Bausch and Lomb) colorimeter at 630 m_μ and was compared with standards treated simultaneously. Different concentrations of cholesterol were also treated earlier and a reference curve passing through the origin was obtained. This was always referred to after obtaining the experimental values.

Results

The initial body weight of the rats in both the groups and the changes observed thereafter are shown in Table I. At the end of two weeks, a negligible difference in the body weight was observed.

Table I

Showing the changes in weight of the rats from 0 to 15 days. Each series included eighteen animals. The day before starting the injections is indicated as 0 day.

	Weight in gm. at 0 day	Weight in gm. after 15 days
Control ..	165 ± 12	166 ± 14
Testosterone propionate treated	196 ± 14	200 ± 2

The average values of free and esterified cholesterol in serum, liver and small intestine of rats are shown in Table II. After the injection of testosterone propionate, an increase in the level of free serum cholesterol is observed while the esterified fraction has decreased by 36%. As a result, the ratio, total/esterified (1 : 3) of serum cholesterol in the control rats increases to 3·1 in the injected rats

Table II

Showing the value of free and esterified cholesterol of serum, liver and small intestine of eighteen rats taken in each series

		Serum cholesterol mg./ml.		Liver cholesterol mg./gm.		Small intestine cholesterol in mg.	
		Free	Esterified	Free	Esterified	Free	Esterified
Controls	Mean value	0·14	0·42	1·88	0·141	8·87	0·38
	S.D	0·03	0·11	0·125	0·0618	0·72	0·05
Testosterone propionate-treated	Mean value	0·65	0·31	1·31	0·032	6·2	0·21
	S.D.	0·17	0·12	0·27	0·005	0·3	0·023

† Kindly supplied by CIPLA, Bombay.

(Fig. 1). The livers of testosterone propionate-injected animals showed a very marked increase in the ratio of total to esterified cholesterol. It was from 14·3 to 42·0. The ratio of weight of liver to body weight however remained constant in both groups. An increase or a decrease in the free or esterified cholesterol respectively or both would yield such results. In this case, the free fraction fell by 30% and the esterified by 77%.

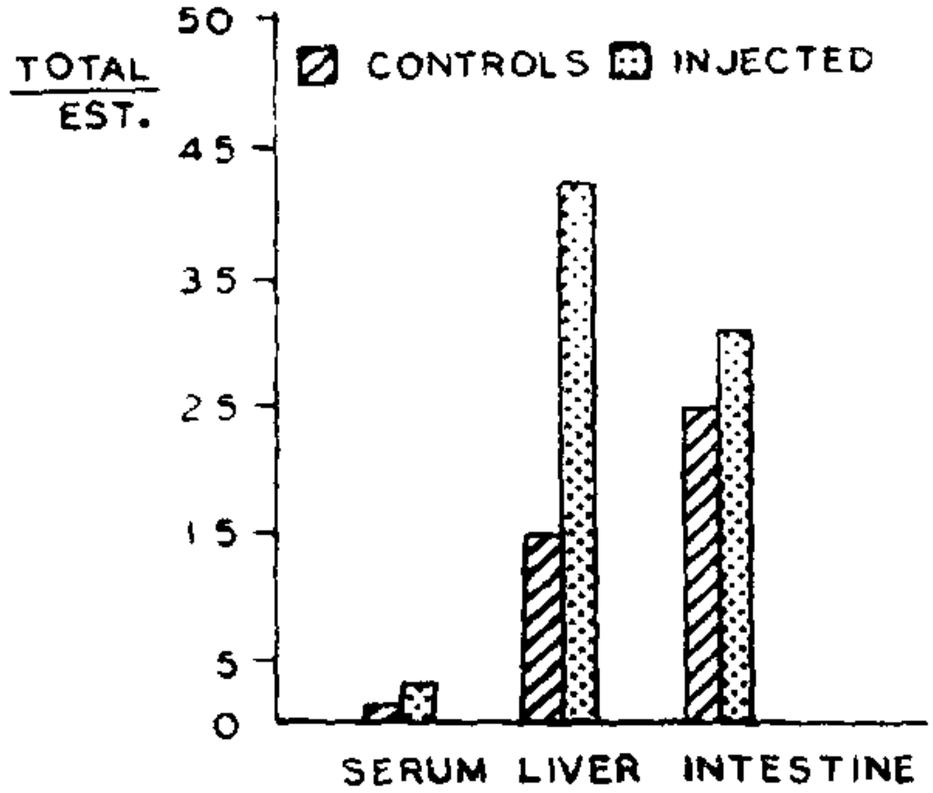

FIG. 1. Showing the value of total/esterified cholesterol values in serum, liver and small intestine.

The total cholesterol of the intestinal wall decreased by 36% while the value of total/esterified ratio has increased slightly. The decrease observed is mainly in the free cholesterol.

Discussion

In a normal adult male rat, the production and metabolism of testosterone is fixed. The exogenous source (5 mg./kg. body weight) administered subcutaneously would normally not metabolise completely through the same pathway but will produce certain effects on responsive tissues of the organism. In general, the metabolic disappearance of a molecule can be observed by three processes functioning in the body: destruction, transformation and incorporation or synthesis. Among these, only the process of transfer gives an idea about the relative distribution of any substance between the organ and the serum. That is the reason that blood cholesterol level is considered as the resultant of its rate of synthesis and of destruction.

Testosterone administration caused a five-fold increase in the free fraction of serum cholesterol indicating an accelerated flow of free cholesterol from hepatic and other tissues into the serum pool. This is in marked contrast with the effect of the thyroid hormones which cause a reverse shift of cholesterol from the blood into the tissues.

The remarkable fall in esterified cholesterol value in the liver could be due to two reasons. One of them is the classical elimination through cholic acid *via* bile. From the increase in serum free cholesterol noted above, it is likely that on administration of testosterone propionate, hepatic cholesterol esters are hydrolysed and then released into serum. This would simultaneously increase the free fatty acids value in serum also.

This androgen caused a fall in intestinal wall cholesterol which is chiefly in the free form.[4] This fall of free cholesterol to about 36% after testosterone propionate could be due to its mobilising action on the cells of the intestinal wall.

The changes in the free and esterified cholesterol fractions of serum, liver and small intestine observed after continuous injections of testosterone propionate demonstrate that along with the decrease in tissue fractions, serum-free cholesterol has increased.

Summary

Significant increase in free cholesterol of serum after continuous injections of testosterone propionate for two weeks, with a corresponding decrease in the values of hepatic and intestinal cholesterol demonstrates the mobilising activity of this androgen in relation to cholesterol. The mobilising effect is from tissues to serum.

I wish to express my thanks to the Dean, T.N. Medical College, Bombay-8, for providing facilities during this work.

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