

Effect of Mahua & Dudhia on Serum Cholesterol level of *Mus domesticus domesticus*

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Abstract: - Cholesterol metabolism is primarily a function of the liver. Rise in the level of serum cholesterol might indicate the enhanced production of cholesterol in the liver or inhibits its secretion to the bile ducts. In the present investigation, we would look into the effect of Mahua and Dudhia on serum cholesterol level of mice. It was found that that both alcohols caused gradual and significant elevation in the value of serum cholesterol at each of the succeeding days of treatment upto ten days but fifteen days treatment caused a significant decrease in this value.

INTRODUCTION

For at least twenty five years, it has been known that alcohol can induce both psychological & physical dependence in animals & humans. It is well known that alcohol is a powerful reinforcer and rewarder, reduces arousal and anxiety levels in normal subjects & indeed may appear to relieve depressive effects in at least some individuals.

In the past recent years, there has been an increase in hospital admission for alcoholism, alcoholic psychosis and deaths. Therefore, it is expected that an increasing number of alcohol-related biochemical abnormalities will be detected by the clinical chemistry laboratory. If the laboratory is to aid the medical staff in the diagnosis of patients & the assessment of their treatment, the range and extent of biochemical abnormalities due to alcohol ingestion must be appreciated. If the development of alcohol abuse and alcohol-related problems are required. Possibly a better understanding of the biochemical abnormalities following alcohol ingestion will allow the development of more specific and sensitive tests for alcohol abuse. It also seems necessary to assess the effect of different variety of alcoholic beverages like Mahua and Dudhia on biochemical aspects of animals.

Hence, it was proposed to study the changes in the serum cholesterol level of *Mus domesticus domesticus* on induction of Mahua and Dudhia in the laboratory.

The laboratory mice (*Mus domesticus domesticus*) are the most widely and convenient animal available to a biologist for research studies. The Swiss Albino mice were selected and purchased from Calcutta as well as from Patna of Bihar state. They were reared in a well ventilated cage with proper supply of food and water. The mice were divided into

following seven groups:- Group A contained ten mice and were used as control which were supplied with the usual diet. Group B consisted again of ten mice and they were treated with commercial grade Mahua (1ml) daily for five days. Group C also consisted of ten mice and were treated with Mahua liquor daily for ten days with the same amount. Group D consisted again of ten mice treated with mahua in the same dose daily for fifteen days continuously.

Group E comprised ten mice which were treated with dudhia liquor daily for five days only. Group F contained a group of ten mice treated with 1ml dudhia daily for ten days. Group G again comprised ten mice and were treated daily with dudhia for 15 days.

II. MATERIAL METHOD

Serum cholesterol level in albino mice is made by Sackett's method. Following reagents were used:

- i) Alcohol-ether mixture (3 volume of alcohol and 1 volume of ether mixed)
- ii) Acetic anhydride-sulphuric acid mixture (20 mL of acetic anhydride mixed with 1 mL of conc. H₂SO₄)
- iii) Chloroform
- iv) Stock standard solution of cholesterol (200 mg of pure cholesterol dissolved in chloroform and made upto 100 ml with chloroform)

Standard solution for use- 1ml of the stock standard solution, diluted to 25 mL with chloroform (5 mL of that solution contained 0.4 mg of cholesterol) In a vital mouse blood was collected and left for half an hour for coagulation. 0.2 mL of serum from coagulated blood added to 10 ml of absolute alcohol-ether mixture in a centrifuge tube. Tube shaken thoroughly for a minute, laid horizontally for half an hour, then centrifuged for 10 minutes and supernatant fluid decanted in a hard glass testtube marked 'T'(Test). Test tube

then placed in a boiling water bath and supernatant fluid allowed to evaporate completely up to dryness. 5 ml of chloroform added to dry substance (cholesterol residue in test-tube) and shaken gently to dissolve cholesterol residue. Meanwhile, working standard solution prepared by mixing 1 ml of stock solution with 25 ml of chloroform. 5 ml of prepared working standard solution taken in another test-tube marked 'S' for standard. Then 2 ml of a mixture of acetic anhydride & conc. Sulphuric acid (in ratio of 20:1) added in both test tubes marked 'T' & 'S'. The solution in test tubes mixed and kept in the dark for 15 minutes for the development of color. The optical densities of the standard and unknown solutions were read in Spectrophotometer using a 560nm filter. The result was finally calculated by the following

formula:-

$$\text{mg of cholesterol per 100ml of blood} = \frac{\text{Reading of unknown(T)} \times 200}{\text{Reading of standard(S)}}$$

III. RESULT

The Serum cholesterol was estimated in the mice of the control group and groups of mice treated with Mahua & Dudhia for five, ten & fifteen days respectively. For Mahua, in the control group of mice, the maximum and minimum values of blood cholesterol were found to be 198.988 mg/100mL and 150.357 mg/100mL of blood respectively. However, the average value was found to be 178.502 + 4.382mg/10mL of blood. Mahua treatment for five days and ten days caused an elevation in the level of serum cholesterol. The average value was 203.594 + 3.362 mg/100ml of blood. Ten days mahua treatment caused further increase in the level of serum cholesterol. The average value was found to be 223.905 + 3.006 mg/100ml of blood. The chronic addition of mahua for fifteen days caused a marked decrease in the level of serum cholesterol. The average value was found to be 167.989 + 2.029 mg/100ml of blood.

TABLE- 1: Showing the test of significance of serum cholesterol level of control and mahua treated Mus domesticus Domesticus

TEST	MEAN	S.D	S.E.	COMPARISON BETWEEN	VARIATION (in mg/100ml)	T-VALUE
Control	178.5024	13.8588318	4.3823849	C-T ₁	25.0925	4.542771**
T ₁	203.5949	10.632489	3.362288	C-T ₁	45.4031	8.5432687**
T ₂	223.9055	9.5070956	3.0064076	C-T ₃	10.5130	2.1767564*
T ₃	167.9894	6.4189931	2.0298638	T ₁ -T ₂	20.3106	4.4652327**
				T ₁ -T ₃	35.6055	9.0656696**
(** Significant at 1% P)				T ₂ -T ₃	55.9161	15.215497**
(*Non- Significant at 1% P)						

For dudhia, the average value of cholesterol in the control group of mice was recorded to be 178.502 +4.382 mg/100ml of blood. It was observed that dudhia treatment for 5 days caused a marked elevation in the level of serum cholesterol. The mean value was recorded to be 243.992 + 4.210 mg/100ml of blood. The maximum elevation in serum

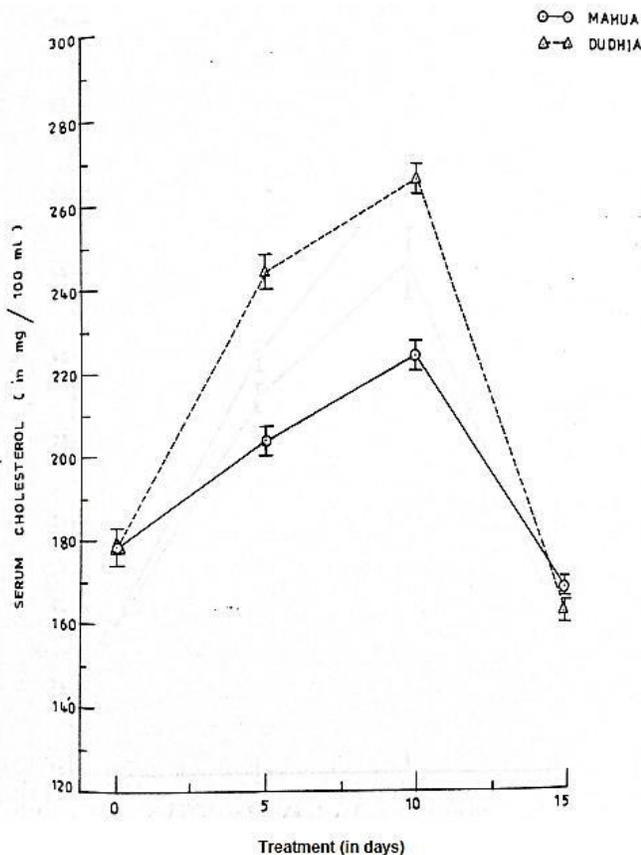
cholesterol was recorded in 10 days treated mice where the mean value was found to be 265.530 + 3.219 mg/100mL of blood. The chronic dudhia treatment for 15 days exhibited a marked decrease in the level of serum cholesterol in albino mice. The average value was recorded 162.376 +2.713 mg/100ml of blood.

TABLE-2: Showing the test of significance of serum cholesterol level of control and dudhia treated Mus domesticus Domesticus

TEST	MEAN	S.D.	S.E.	COMPARISON BETWEEN	VARIATION (IN MG/100 ML)	T-VALUE
Control	178.5024	13.8588318	4.3823849	C-T ₁	65.4902	10.775664**
T ₁	234.9926	13.316139	4.2109328	C-T ₁	87.0277	16.004235**
T ₂	265.5301	10.180514	3.2193611	C-T ₃	16.1260	3.1284752*
T ₃	162.3764	8.581653	2.7137569	T ₁ -T ₂	21.5375	4.0632279**
				T ₁ -T ₃	81.6162	16.291849**
(** Significant at 1% P)				T ₂ -T ₃	103.1537	24.498844**
(* Non-significant at 1% p)						

cholesterol level of Mus domesticus domesticus

FIG: Showing the effect of mahua and dudhia on serum



REFERENCES

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 [2] Ostrander, L.D.; Block, W.D.; Johnson, B.C.; Ravenscroft, C. & Epstein, F.H. (1974): Relationship of serum lipid concentrations to alcohol consumption. *Archives of Internal Medicine* 134: 451-456.

IV. DISCUSSION

Thus, a significant rise in the serum cholesterol level upto 10 days Mahua and Dudhia treatment might be attributed to the stimulation of adrenal gland on alcohol consumption. The liver is the active site of lipid storage & synthesis whose physiology is changed on the effect of alcohol leading to transfer of cholesterol from the liver & from other organs to the serum. A decrease in the level of serum cholesterol in 15 days treated mice was due to increased breakdown of cholesterol into free fatty acids.

V. SUMMARY AND CONCLUSION

Cholesterol metabolism is primarily a function of liver so the rise in the level of serum cholesterol might be due to enhanced production of cholesterol in liver or inhibits its secretion to the bile ducts. A decrease in the serum cholesterol level due to alcohol treatment is not well defined but hypocholesterolemic conditions are frequently obtained in anaemia and similar decrease in case of acute stress. A significant fall in its level beyond ten days treatment might be because of tendency of the mice towards acclimatization.