Contents

Contents	Page no.
Introduction	1
Review of literature	4
Cholesterol.	4
Simvastatin.	5
Effects of cholesterol and simvastatin on hematological parameters.	6
Effects of cholesterol and simvastatin on respiratory functions of blood.	7
Effects of cholesterol and simvastatin on the biochemical parameters.	11
Effects of cholesterol and simvastatin on DNA damage.	19
Materials and methods	21
A. Materials :	21
1. Experimental animals.	21
2. Cholesterol.	21
3. Simvastatin.	22
B. Methods:	22
➢ Experimental design.	22
➢ Blood sampling and hematological and biochemical determinations.	23
➢ Handling of tissue samples.	23
➢ Hematological determinations.	24
➢ Determination of respiratory function of blood.	25
• Blood sampling.	25
1- Analysis of blood gases and acid-base status.	26
2- Determination of blood oxygen equilibrium curve (OEC).	27
3- Calculations of oxygen-carrying capacity and oxygen content.	28
➢ Biochemical analysis.	28
• Determination of serum glucose concentration	28
• Determination of serum total protein concentration	28
• Determination of serum albumin concentration	29
• Calculation of serum globulin concentration	29
• Determination of serum triglyceride concentration	29
• Determination of serum total cholesterol concentration	29
• Determination of serum HDL cholesterol concentration	29

Contents	Page no.
• Calculation of serum LDL cholesterol concentration	30
• Calculation of serum VLDL cholesterol concentration	30
• Calculation of atherosclerotic index	30
• Determination of liver total cholesterol concentration	30
• Determination of serum transaminases (ALT and AST) activity	31
• Determination of liver transaminases (ALT and AST) activity	31
• Determination of serum urea nitrogen concentration	31
• Determination of serum uric acid concentration	31
• Determination of serum creatinine concentration	32
➢ Hormone determinations.	32
• Determination of serum triiodothyronine (T_3) and thyroxine (T_4) levels.	32
• Determination of serum total testosterone level.	32
➢ DNA fragmentation.	33
➢ Data presentation and statistical analysis	34
Results	35
✓ Relative organ weight.	35
✓ Hematological parameters.	38
✓ Respiratory Functions of Blood.	44
I. Blood gas parameters.	44
A. Blood oxygen.	44
1. Blood oxygen partial pressure (PO_2).	44
2. Blood oxygen saturation %	47
3. Oxygen content	49
4. Blood oxygen carrying capacity	51
B. Blood carbon dioxide partial pressure (PCO_2)	51
II. Blood acid-base status parameters.	53
A. Blood pH	53
B. Blood bicarbonate	53
C. Total carbon dioxide (TCO_2)	57
D. Base excess	59
III. Blood oxygen equilibrium curve.	59
✓ Biochemical parameters.	
I. Serum glucose	65
II. Serum proteins	65
III. Lipid profile.	70
IV. Serum and liver transaminases.	76

Contents	Page no.
V. Kidney function.	79
✓ Hormonal assays.	
I. Serum levels of triiodothyronine (T_3) and thyroxine (T_4).	82
II. Serum testosterone.	82
✓ DNA fragmentation %.	82
Discussion.	90
English summary.	102
References.	107
Arabic summary.	131