#### CARDIOPROTECTIVE EFFECTS OF VEDICINAL-9 ON ISOPROTERENOL INDUCED MYOCARDIAL INFARCTION IN RATS

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 Objective: The objective of the study is to assess the effect of pre and post treatment of Vedinical-9 in isoproterenol induced myocardial infarction in rats



Need for innovative approach to manage the practical problems

### **Experimental Design**

Group	Treatment	Route	Sex (No. of animals)
G1	Isoproterenol-Single Dose	Sub cutaneous	1-6
G2	Vedicinal-9 Normal + Single Dose Isoproterenol	Oral + Sub cutaneous	7-12
G3	Vedicinal-9 Bio-enhanced + SingleOral + SubDose Isoproterenolcutaneous		13-18
G4	Isoproterenol-Divided Dose	Sub cutaneous	19-24
G5	Vedicinal-9 Normal + Divided Dose Isoproterenol	Oral + Sub cutaneous	24-30
G6	Vedicinal-9 Bio-enhanced + Divided Dose Isoproterenol	Oral + Sub cutaneous	31-36



#### **Induction of Myocardial infarction**

- G1- Animals received isoproterenol at dose of 60 mg/kg body weight as a single dose by subcutaneous route.
- G4 Animals received isoproterenol at dose of 85 mg/kg body weight in to two divided doses by subcutaneous route at interval of 24 hrs.





# Following observations were recorded during experimental period;

- Clinical Signs- Twice a day
- **Clinical pathology evaluations-** On Day 11 blood was collected, plasma pooled and analysis of CK-MB, LDH, AST, ALT, ALT:AST, Creatinine were performed.
- **Gross Pathology Observations-** At necropsy and cross sections of formalin fixed heart.
- Heart Weights- Absolute heart weights recorded at the time of necropsy.
- **Histopathology-** Heart weight and histopathological observations of the heart.





Isoproterenol + Vedicinals-9 Formulation

	Group	CREAT	GPT	GOT	CK-MB	
Mean	G1-Single isoproterono I	0.83	135.43	113.45	137.92	410.23
SD		0.19	24.77	9.21	16.06	90.17
N		6	6	6	6	6
Mean	G2-Vedicinal- 9 normal	0.81	113.33	109.78	128.93	375.47
SD		0.19	24.76	10.39	8.18	71.86
N		6	6	6	6	6
Mean	G3-Vedicinal- 9 bioenhanced	0.71	89.53*	100.62	116.55*	342.70
SD		0.17	13.54	10.52	8.44	89.20
N		6	6	6	6	6





Isoproterenol + Vedicinals-9 Bio-enhanced Formulation

	GROUP	CREAT (mg/dl)	GPT (U/L)	GOT (U/L)	CK-MB (U/L)	LDH (U/L)
Mean	G4	0.68	89.55	140.70	145.14	486.28
SD		0.32	12.83	35.13	14.18	85.19
N		6	6	6	6	6
Mean	G5	0.58	100.50	116.17	133.37	407.08
SD		0.13	19.70	17.41	9.63	62.96
N		6	6	6	6	6
Mean		0.58	88.95	114.13	124.97*	374.63
SD	G6	0.17	22.20	50.86	10.02	112.95
N		6	6	6	6	6



- Clinical pathology evaluations-
  - Isoproterenol administration at single dose showed more damage than that caused by the divided doses of isoproterenol.
  - In the experimental group receiving single dose of isoproterenol both treatments, normal formulation and bio-enhanced formulation of Vedicinal-9 has brought the increased GPT values of all clinical chemistry parameters to normal, however the bio-enhanced more pronounced effects on these parameters compared to normal formulation.
  - Similar results observed in the experimental group receiving divided doses of isoproterenol, except for the creatinine and GPT parameters where normal formulation of vedicinal-9 has similar or no recovery effects compared to bio-enhanced formulation. For remaining parameters bio-enhanced formulation performed better than normal formulation.









#### **Divided Dose of Isoproterenol**

GΡT























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CK-MB(U/L)

or

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СК-МВ(U/L)







# Results Absolute Heart Weights

• The experimental group receiving Single dose of isoproterenol, bio-enhanced formulation of Vedicinal-9 reduced the heart weights. Divided doses of isoproterenol, bio-enhanced Vedicinals-9 formulation significantly increased heart weights above that of normal Vedicinals-9 formulation or only isoproterenol.

Tissue/ Findings/Sex				Females			
Dose Group	G1	G2	G3	G4	G5	G6	
Dose (mg/kg)	Isoproteren ol (Single Dose 60)	Vedicinals- 9 (100)	Vedicinals-9 Bioenhance d (100)	Isoprotere nol (Divided Dose 85)	Vedicinals- 9 (100)	Vedicinals- 9 Bioenhanc ed (100)	
Number Examined Heart	6	6	6	6	6	6	
Mean	0.75	0.76	0.71	0.72	0.77	0.78*	

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# Results Histopathology

#### Isoproterenol + Vedicinals-9 Formulation



**Group 1**: Isoproterenol – Mild myocardial degeneration, infiltration of inflammatory cells, and extra-vasated RBCs. H &E, 40X



**Group 2**: Isoproterenol+Vedicinal-9 – Minimal myocardial degeneration, vacuolations, No infiltration of inflammatory cells, and no hemorrhages seen. H &E, 40X



**Group 3**: Isoproterenol+Vedicinal-9 bioenhanced – Minimal myocardial degeneration, No infiltration of inflammatory cells, and No hemorrhages or vacuolations seen. H &E, 40X



# Results Histopathology

#### Isoproterenol + Vedicinals-9 Bio-enhanced Formulation



**Group 4**: Isoproterenol Divided dose– Minimal myocardial degeneration, infiltration of inflammatory cells, and extra-vasated RBCs. H &E, 40X



**Group 5**: Isoproterenol+Vedicinal-9 – Minimal myocardial degeneration, and minimal focal infiltration of inflammatory cells, and no haemorrhages seen. H &E, 40X



**Group 3**: Isoproterenol+Vedicinal-9 bioenhanced – Minimal myocardial degeneration and infiltration of inflammatory cells, and minimal focal fibrous tissue proliferation seen. H &E, 40X





 Based on the present study conditions, it can be concluded that the both formulations of Vedicinals-9 showed cardioprotective activity, whereas Bio-enhanced formulation performed better than that of normal Vedicinals-9 formulation.



#### Thank you !



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