INTERNATIONAL JOURNAL OF CURRENT ADVANCED RESEARCH
ISSN: O: 2319-6475, ISSN: P: 2319-6505
Available Online at www.journalijcar.org
Volume 14; Issue 04; April 2025; Page No.189-195
DOI: http://dx.doi.org/10.24327/ijcar.2025.195.0042

Subject Area : Pharmacy

EVALUATE THE EFFECT OF ARNICA MONTANA ON DOXORUBICIN-INDUCED MYOCARDIAL INFARCTION IN WISTAR ALBINO RATS

Vikas Kumar*[1], Radha[2], Shivam Kumar[3], Arun Kumar[4], Abhinit Kumar[5], Lav Kumar[6] and Kaushal Kumar[7]

Parmarth College of Pharmacy, Hapur, Uttar Pradesh, 245101

ARTICLE INFO

Received 16th March 2024
Received in revised form 23rd March, 2024
Accepted 18th April, 2025
Published online 28th April, 2025

Key words:

CHF, Myocardial Infarction, Arnica Montana, Oxidative Stress

ABSTRACT

Aim: Evaluate the effect of Arnica Montana on doxorubicin-induced myocardial infarction in wistar albino rats.. **Background:** Myocardial infarction is a disorder of cardiac cells injury, whenever the muscle tissue is not receiving enough oxygen in at atleast one area, myocardial localized necrosis occurs. This occurs while the blood flow to such cardiac muscle is restricted. **Material & methods:** The myocardial infarction model was performed in animal by the administration of 2 mg/kg doxorubicin (DOX) via i.p route for 14 day, and the antagonistic effect of the herbal arecamontana was evaluate by the assessment of the antioxidant effect in animal blood serum. **Results & discussion:** Arnica montana have the efficacy to reduces the cardiac infraction, which is confirm by decreasing the oxidative markers such as SOD, TBARS, Catalase, CKMB, GSH and LDH level. **Conclusion:** The result shows Arnica montana have a significant effect against doxorubicin induced myocardial infarction. Thus the Arnica montana have the potential and reliable treatment option for myocardial infarction.

INTRODUCTION

The primary driver of dismalness and mortality these days is coronary illness, which incorporates stroke. Inside this country, there appear to be 50 million people with hypertension and 62 million people with coronary illness. Cardiovascular condition caused 39% of all passings overall in 2000, by right around 946,000 passings(Nabel, 2003). Data that atherosclerosis is for the most part avoidable has been introduced by populace - based examinations and randomized clinical preliminaries. Nonetheless, there is likewise proof to recommend that the disease has an inherited part. I accentuate why hereditary factors in coronary illness inside this audit currently comprehended are. What we ought to do might change if new genomic discoveries are applied to the treatment of individuals with cardiovascular sickness(Cooper et al., 2000).

MATERIAL AND METHOD:

Experimental animal:

*Corresponding author: **Vikas Kumar**

B2 Uday Mitra Soc Kurla East Mumbai, Postal Code 400024 - India

Male wistar rats weighing between 200 and 240 g. Animals were maintained in polypropylene cages under sanitary circumstances with a 12 hour light/dark cycle at a temperature of 22+3°C. Throughout the trial, animals were given free access to water and a regular laboratory pellet food on a daily basis. Throughout the trial, animals were weighed at regular times. The Institutional Animal Ethical Committee's guidelines were strictly followed in all of the research and techniques detailed here (IAEC).

Dosing of Animals:

Animals were divided into five groups, each group containing 6 rats per group.

- **Group 1** – Normal saline 1ml/kg, p.o once daily for 14 days and Normal saline 1ml/kg/48 hours, i.p for 14 days.
- **Group 2** – Doxorubicin (DOX) 2 mg/kg/48hours, i.p for 14 days.
- **Group 3 –** 200 µL of 30cH Arnica montana orally once daily for 14 days and Doxorubicin 2mg/kg/48 hours, i.p for 14 days.
- **Group 4** – 200 µL of 200cH Arnica montana orally once daily for 14 days and Doxorubicin 2mg/kg/48

hours, i.p for 14 day.

- **Group 5** - Cactus grandifloras 200 µL, p.o once daily for 14 days.

Chemicals used in the experiment

DPPH (2.2-diphenyl-1-picryl-hydrazyl), $Fecl_2$, N-methylglucamine, Lithium lactate, Glacial acetic acid, Thiobarbituric acid, DNTB (5, 5 dithiobis- 2-nitrobezoic acid), EDTA, KH2POa, Na2HPO4, Hydrogen peroxide, NaCl, Triton X-100, Digitonin, Evans blue dye, Triphenyltetrazolium chloride, Potassium phosphate buffer (ph 7.4), Formalin.

Glassware's and apparatus used in the experiment

Centrifuged, Incubator, UV spectroscopy, Refrigerator, Chemistry analyzer, Vortex blender, Heparized tube, Pricking niddle, Pipette, Forceps, Petric plate

Evaluation parameters:

Biochemical estimations in serum

Creatine kinase-MB

- The results of this test reveal how much creatine kinase (CK) isoenzyme is present in your blood. It is known as CK-MB. A blood specimen is used for the test. Blood is taken from a veins in your hand or arm using a needle.
- Before use, permit the testing, specimen, and/or controls to achieve room temperature (15–30°C).
- Before unpacking the packet, bring it to ambient temperature. Take the test device out of the ale pouch and start using it right away. The test should be carried out as soon as the foil pouch is opened for the best results.
- Set the test instrument down on a spotless, flat surface.
- For samples of serum or plasma: Record the time after transferring 2 drops of serum or plasma (about 50 L) into the test device while holding the dropper upright.
- For catheter insertion whole blood samples, hold the drip vertically and add 3 drops of the liquid to the sample well (S) of the testing instrument. Next, add 1 drop of the buffer solution (equal to about 40 L) and set the timer.
- For samples of fingerstick whole blood:
- Using a capillary tube, filling it with whole blood from 75 fingersticks, transfer it to the sample well (S) of the test equipment, add one drop of buffers (equal to about 40 L), and set the timer.
- How to apply hanging drips Allow three hanging droplets of fingerstick whole blood L) to fall into the specimen well (S) in the test device's centre, then add one drop of buffer (about 40 L), and then set the timer.

Lactate Dehydrogenase

Serum or plasma treated with lithium anticoagulation are accepted specimen types. The serum used in the NHANES Biochem study is chilled. NHANES Vial 018 is used for this test's analysis. To stop red cell LDH from draining first from cells, blood must be centrifuged and the plasma extracted within an hour of sample taken (optimal/minimal volume: 100 L in a test holder or 2 mL microtube (2.8 L plasma for test)). Within an hour after collection, isolated serum or plasma needs to be taken from the cells. For seven days at 15–25°C, four days at 2–8°C, six weeks at -20°C, and longer at –70°C, serum or plasma is stable.

Specimen Transport andhandling: Before using, thoroughly combine the samples, let the clot fully form (if using serum), then centrifuge for 10 minutes at 2000 x g. Aliquot at least 0.1 mL. Until shipment, keep the sample in the fridge. Ship at a cool temperature.

Reagents and Supplies: LDHI2 reagent kit (300 tests):

Reagent Preparation

- R1 reagent. N-methylglucamine: 400 mmol/L, pH 9.4 (37 °C); lithium lactate: 62 mmol/L; stabilizers; preservatives.
- R2 reagent. NAD: 62 mmol/L, stabilizers and preservatives. Reagents ought to be kept chilled until use. Fairly on examination apparatus, the reagents stay stable in the fridge for quite a long time.

Equipment/Instrumentation- Roche Cobas 6000 Chemistry Analyzer

- The CLSI Medical Laboratory Reagents Water (CLRW) criteria are adhered to in the design of the Millipore Elix Gulfstream Clinical 35 System. Reverse osmosis, electrodeionization, a bactericidal 254 nm UV light, and 0.22 m filtration are used to purify water.

Thio-barbituric acid reactive substances (TBARS):

- **Preparation of TBA Reagent**: In cold acidic corrosive, the reference volume of 4.0 mM TBA was made. For this, 100 mL of frosty acidic corrosive was utilized to disperse 57.66 mg of TBA. Consistently, another TBA arrangement was made.
- **Preparation of MDA and Calibration Standards:** In chilly acidic corrosive, a standard arrangement of MDA (1 mM) was made. MDA was exactly weighed out at 31.35 milligrams and weakened in 100 mL of dissolvable. Sequential weakenings of 0.1, 0.2, 0.4, 0.6, and 0.8 mM were created either the standard arrangements. In the volume scope of 0.1 to 1.0 mM, the standard bend was fabricated.
- **Extraction of TBARS in Fried Samples:** In a 25 mL volumetric jar with 5 mL of the reagent, one gram of each broiled powder structure (samosa, seared bread, Shami kebab, and potato chips) was taken. Either 100 percent frosty acidic corrosive or half chilly acidic corrosive in fluid filled in as the dissolvable (AW). To prevent the medium from further oxidizing, BHT (0.01%) was used. The examples were disturbed and purged for 60 minutes. At the point when essential, the concentrate was centrifuged and utilized for tests.
- **Analytical Procedure:** In a 10 mL vial, 1 mL of TBA was added to 1 mL of the reference MDA blend. The material was cooked for 1 hour at 95°C in a bath of bubbling water. The vials were cooling to surrounding temperature, and an UV-noticeable spectrophotometer, was utilized to survey absorbance at 532 nm (Shimadzu, Japan). The above strategy was finished for every

alignment standard (n=3). The norm or test were traded out for acidic corrosive or water while rehashing a clear example (n=5). Samosa, broiled bread, Shami kebab, and potato chips were among the cheap food tests that were accumulated. Two separate kinds of test extricates - 100 percent frosty acidic corrosive (AA) and half icy acidic corrosive with water - were made (AW). Each example's concentrate (1 mL) was joined with 1 mL of TBA reagent, and the interaction above was done multiple times (n=5). Utilizing the accompanying equation, the not entirely settled as mM/g of the example:

$$TBARS\ (mM/g) = (Ac \times V)/W$$

where W is the mass of the example got, Ac is the amount determined from the alignment chart, and V is the amount (in mL) or sequential weakening of the whole concentrate ready.

- **Method Validation:** The ICH rules were utilized to confirm the insightful system. The various fixations that were tried (n=3) in the scope of 0.1-1.0 M were utilized to assess linearity. The gauge adjustment bend was utilized to work out the constraints of noticeable and scopes of reproducibility. At three doses of 0.1, 0.4, and 0.8 M, accuracy was surveyed as far as intraday (n=3) and interday (n=5). (n=9) Durability was surveyed at a portion of 0.8 M. Mending examinations in samosa tests (n=9) at two unmistakable extraction strategies were utilized to check the program's viability. The division code for unadulterated cold acidic corrosive is AA, while the code for chilly acidic corrosive that has been blended in with water by half is AW.

GSH level

Principle: The spectrophotometric process is depend upon the method of Ellman. 5, 5 dithiobis- 2-nitrobezoic acid (DNTB), is condensed by –SH group so that one mole of 2-nitro-5-mercaptobezoic acid per mole of –SH.

Reagents Required

- **EDTA (0.2M) -** 22.3gm of EDTA was solubilised in 300ml of warm double distilled water.
- **EDTA (0.02M) –** 20 ml of above solution was diluted in 200ml of double distilled water.
- **DTNB (0.01M) –** 99mg of DNTB was dissolved in 25ml of absolute methanol.
- **TCA (50%) –** 50 gm of TCA was dissolve in 100 ml of double distilled water.

Procedure:

- **Test –** A known wt of tissue was homogenized in 5-8 ml of 0.02M of EDTA & afterward 4.0 ml of cold refined water was mixed to it. subsequent to blending it, 1 ml half trichloroacetic acid (TCA) was mixed and shaken irregularly for 10 minutes utilizing vortex blender. after 10 minute the substance was moved to axis tubes (washed in EDTA) then centrifuged for fifteen min at 6000 rpm. After centrifugation, 4.0 ml of 0.4 M Tris Cradle and 2 ml of the buildup were joined (pH 8.9).
- **Blank –** The strategy was same concerning the test aside from that 0.02 M EDTA was included spot of the tissue homogenate.
- **Standard -** The strategy was same concerning the test aside from the glutathione arrangement (50µg/ml) was utilized instead of tissue homogenate.

CALCULATION

GSH (tissue) was calculate from the equation and expressed as µg/mg of protein.

Catalase

Use industrially accessible, % hydrogen peroxide for introductory checks of aerobes. The hydrogen peroxide ought to be kept chilled in a dim jug. A 15% H2O2 arrangement is expected for the location of anaerobic microorganisms. In this present circumstance, the catalase test is used to recognize Bacillus species that are catalase positive and aerotolerant types of Clostridium that are catalase negative. A variable centralization of H2O2 is required for the superoxol catalase test used to decide the assumed speciation of explicit Neisseria species. For more data, see the "Extra Recommendations" area.

Slide method

- Put a petri dish with a magnifying lens slide within it. Keep up with the petri dish cover helpful. It isn't important to use a petri dish in light of the fact that the slide catalase can be done really without one.
- In any case, the utilization of a petri dish is unequivocally encouraged to restrict catalase sprayers, which have been shown to contain live bacterial creatures.
- Gather a small measure of the living being from a very much detached 18-to 24-hour province and store it on the magnifying instrument slide utilizing a sterile wooden device stick or inoculation circle. Get no agar, please.
- This is urgent assuming the province segregate was raised on red platelet implanted agar. Red platelet vestige into the test could prompt a bogus positive outcome.
- Put a drop of 3% H2O2 on the creature utilizing a Micropipette or teaspoon, on the magnifying lens slide. Never blend.
- Cover the petri dish with a top immediately to forestall sprayers and watch for the rise of air pockets (O2 + water = bubbles).
- It is simpler to understand while searching for air pockets to shape on a dim foundation.
- Fizz (bubble development) following positive responses is an indication of progress.
- Utilize an amplifying glass or magnifying instrument to see frail positive responses on a magnifying lens slide set over a dim background.
- In the case of utilizing a magnifying lens, cover the slide with a cover slip and amplify multiple times.
- A catalase-negative response is one in which no air pockets create in light of the fact that the hydrogen peroxide can't be hydrolyzed by the catalase chemical.
- Using creatures that are known to be catalase positive and negative, quality control is done.

- **Note:** Avoid adding 3% H2O2 to the slide before the creature in the event that a platinum immunizing circle is being utilized, since the platinum wire in the know could bring about a misleading positive outcome. With nichrome wire, this isn't true.

Administration of Native-Superoxide Dismutase

Principle

At lessening frequency, entrance in the UV range H202 increments consistently. The drop in frequency at 240 nm (e240 = 0.00394 — - 0.0002 liters mmol - I mm-I) could be essentially connected with the breakdown of H202. 4 The catalase not set in stone by the variety in absorbance/unit of time. It is expected to utilize a sensibly low H202 amount to forestall closure of the protease all through the examination (which endures commonly 30 sec) or the improvement of puffs in the vial because of 02 break (10 mM). Since the substance of the material and the pace of breakdown are straightforwardly relative, the H2O2 focus is significant. In view of the one of a kind conditions in catalase, there is nearly nothing (Qi0 - 1.1) dependence of the H202 corruption on temperature, permitting estimations to be made somewhere in the range of 0 and 37 °C, but 20 °C is encouraged. The tests are finished at pH 7.0. The pH action bend comparable to V0 shows an expansive pH ideal (pH 6.8-7.5).

Reagents:

- Phosphate buffer 50 mM, pH 7.0: dissolve
- 6.81 g KH2POa, and
- 8.90 g Na2HPO4
- 2H20 and up to 1000 ml of refined water per individual. Blend parts (a) and (b) in a 1:1.5 (v/v) proportion. hydroxyl extremists Dilute 30 mM with 0.34 ml. 100 ml of 30% hydrogen peroxide in phosphate cradle

Procedure

- Heparin or citrate-containing significant veins is handled to isolate the serum and cell layers.
- multiple times with isosmotic NaCI are utilized to flush the rbc accelerate.
- The planning of a stock hemolysate includes adding four parts of sterile water to an answer that contains - 5 g Hb/100 ml.
- Straightforwardly before to the examination, a 500 weakening of such an immersed hemolysate is made with phosphate cradle, and its Hb (hemoglobin) fixation is assessed in three-fold.
- 0.1 or 0.02 ml of blood vessels is analyze intense in 250 or 50 ml of refined water.
- A new blood example should be utilized to discover the hemoglobin content in the event that it is required as a visual reference.

Measurement

- On the off chance that it is feasible to get successful arrangements or lysates after complete annihilation of all compartments, catalase levels in organs with sensibly high activity, for example, the kidney and liver can be evaluated uv - noticeable spectrophotometer.
- The stock homogenized readiness process should incorporate the use of a cleanser to forestall the creation with too bad worth. With phosphate cushion, pH 7.0, more weakenings can be ready.
- Be that as it may, the huge UV absorbance of Triton X-I00 should be thought about in the event that the material following organelle lysis can to be sure be debased to this sum.
- Substitute choices incorporate the utilization of sodium cholate (0.25%) or digitonin (0.01%). The typical method for communicating the catalase action of tests taken is in milligrams of wet weight or milligrams of complete N.

Assay Conditions

Range 240 nm absorbance, light way 10 mm, and all out volume 3 mi. Look at an example that contains two milliliters of response blend or hemolysate and 1 ml of H202 at 20 ° (beneath surrounding temperature) to a clear having 2 ml of a similar substance in addition to 1 ml of phosphate support instead of the substrate. H202 is added to start the response. About A = 0.500 ought to be the underlying absorbance. Utilizing a recorder, screen the decrease in permeableness for around 30 seconds after completely blending in with a plastic oar.

Table 1. Animals will be divided into Five groups and the duration of study will be 14 days. The treatment schedule for each group is as follows

Sr. No.	Groups name	Treatment	Dose & route of drug administration	Duration
1.	Control Group	Normal saline	1 ml/kg per animal Intraperitoneally	14 days (Daily)
2.	Doxorubicin treated group	Doxorubicin	2 mg/kg/48hour per animal Intraperitoneally	14 days (Daily)
3.	Low dose Arnica montana and Doxorubicin group	Arnica montana Doxorubicin	200 µL of 30cH per animal orally and 2mg/kg/48 hours per animal Intraperitoneally	14 days (Daily)
4.	High dose Arnica montana and Doxorubicin group	Arnica montana Doxorubicin	200 µL of 200cH per animal orally and 2mg/kg/48 hours per animal Intraperitoneally	14 days (Daily)
5.	Cactus grandiflorus group	Cactus grandiflorus	200 µL/ per animal Intraperitoneally	14 days (Daily)

RESULT AND DISCUSSION

Effect of Arnica montana on Lactate dehydrogenase (LDH) levels in different treatment groups

Table 2 and Figure 1 show the alterations in LDH level after treatment with doxorubicin, Arnica montana and Cactus grandifloras. Doxorubicin treated groups showed significant ($p<0.001$) rise in LDH levels when compared with the control group. However, treatment with Arnica montana ($p<0.001$) and Cactus grandifloras ($p<0.001$) significantly prevented the increase in LDH levels.

Table 2. Lactate dehydrogenase (LDH) level data showing Mean ± SD

Lactate dehydrogenase (LDH) level		
S. No.	Groups	Mean ± SD
	Control	97.5 ± 1.87
	Dox	217.16 ± 2.78 a***
	Arnica montana Low Dose	162.83 ± 2.78 a***, b***
	Arnica montana High Dose	113.16 ± 7.277 a***, b***, c***
	Cactus grandifloras	115.83 ± 3.54 a***, b***, c***

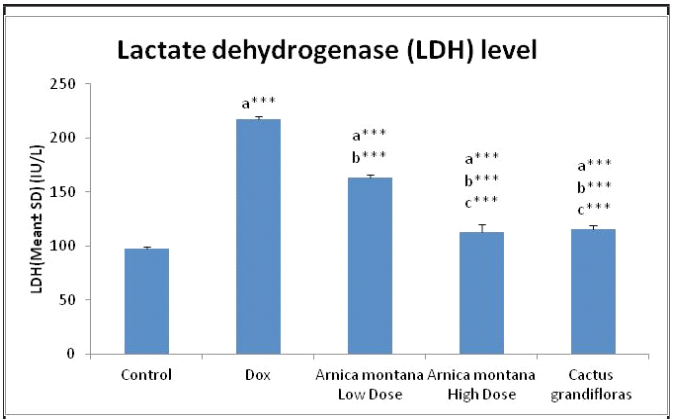

Figure 1. Comparison of the effect of Arnica montana and Cactus grandifloras on LDH level in doxorubicin induced cardio toxicity on experimental animal rats. The data represent the mean ± SD. ***p < 0.001, **p<0.01, *p<0.05. a vs. Control b vs. Doxorubicin, c vs arnica Montana low dose.

Effect of Arnica montana on CKMB levels in different treatment groups

Table 3 and Figure 2 show the alterations in CKMB level after treatment with doxorubicin, Arnica montana and Cactus grandifloras. Doxorubicin treated groups showed significant ($p<0.001$) decrease in CKMB levels when compared with the control group. However, treatment with Arnica montana ($p<0.001$) and Cactus grandifloras ($p<0.001$) significantly prevented the decrease in CKMB levels.

Table 3. CKMB level data showing Mean ± SD

CKMB		
S. No.	Groups	Mean ± SD
	Control	74.5 ± 1.87
	Dox	1.15 ± 0.18 a***
	Arnica montana Low Dose	37.66 ± 2.16 b***
	Arnica montana High Dose	62.5.16 ± 1.87 a***, b***, c***
	Cactus grandifloras	63.33 ± 1.86 b***, c***

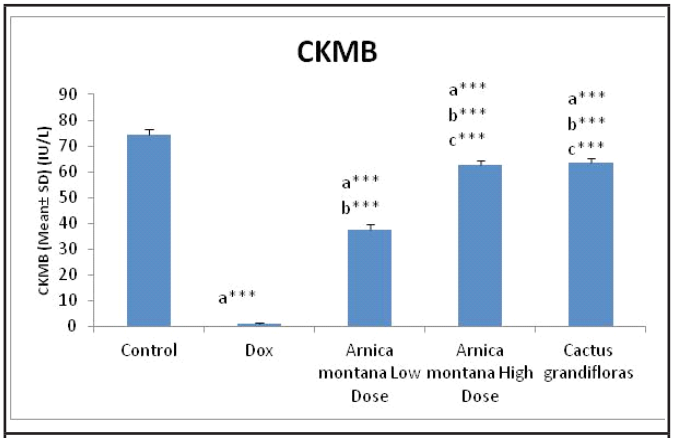

Figure 2. Comparison of the effect of Arnica montana and Cactus grandifloras on CKMB level in doxorubicin induced cardio toxicity on experimental animal rats. The data represent the mean ± SD. ***p < 0.001, **p<0.01, *p<0.05. a vs. Control b vs. Doxorubicin, c vs arnica Montana low dose.

Effect of Arnica montana on TBARS levels in different treatment groups

Table 4 and Figure 3 show the alterations in TBARS level after treatment with doxorubicin, Arnica montana and Cactus grandifloras. Doxorubicin treated groups showed significant ($p<0.001$) decrease in TBARS levels when compared with the control group. However, treatment with Arnica montana ($p<0.001$) and Cactus grandifloras ($p<0.001$) significantly prevented the decrease in TBARS levels.

Table 4. TBARS level data showing Mean ± SD

TBARS		
S. No.	Groups	Mean ± SD
	Control	74.5 ± 1.87
	Dox	1.15 ± 0.18 a***
	Arnica montana Low Dose	37.66 ± 2.16 a***, b***
	Arnica montana High Dose	62.5.16 ± 1.87 b***, c***
	Cactus grandifloras	63.33 ± 1.86 b***, c***

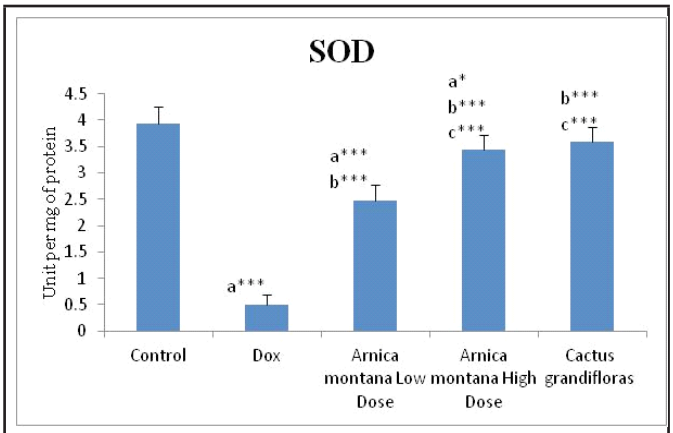

Figure 3. Comparison of the effect of Arnica montana and Cactus grandifloras on TBARS level in doxorubicin induced cardio toxicity on experimental animal rats. The data represent the mean ± SD. ***p < 0.001, **p<0.01, *p<0.05. a vs. Control b vs. Doxorubicin, c vs arnica Montana low dose.

Effect of Arnica montana on Catalase levels in different treatment groups

Table 5 and Figure 4 show the alterations in catalase level after treatment with doxorubicin, Arnica montana and Cactus grandifloras. Doxorubicin treated groups showed significant (p<0.001) rise in catalase levels when compared with the control group. However, treatment with Arnica montana (p<0.001) and Cactus grandifloras (p<0.001) significantly prevented the increase in catalase levels.

Table 5. Catalase level data showing Mean ± SD

Catalase		
S. No.	Groups	Mean ± SD
1	Control	16.68 ± 0.86
2	Dox	26.68 ± 0.86 a***
3	Arnica montana Low Dose	21.26 ± 1.02 a***, b***
4	Arnica montana High Dose	18.7 ± 0.39 a*, b***, c**
5	Cactus grandifloras	18.95 ± 1.57 a**, b***, c**

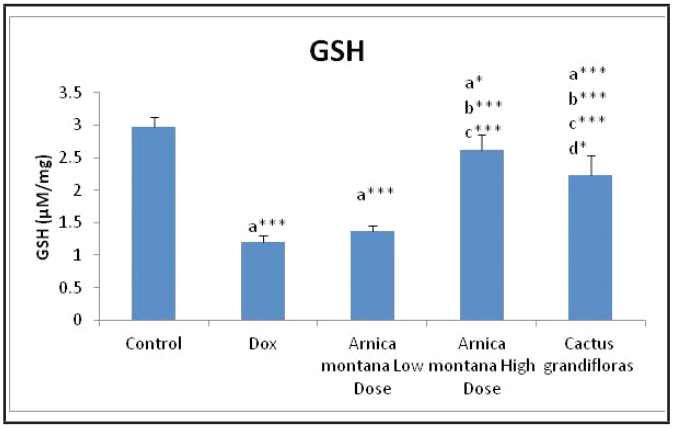

Figure 4. Comparison of the effect of Arnica montana and Cactus grandifloras on Catalase level in doxorubicin induced cardio toxicity on experimental animal rats. The data represent the mean ± SD. ***p < 0.001, **p<0.01, *p<0.05. a vs. Control b vs. Doxorubicin, c vs arnica Montana low dose.

Effect of Arnica montana on SOD levels in different treatment groups

Table 6 and Figure 5 show the alterations in SOD level after treatment with doxorubicin, Arnica montana and Cactus grandifloras. Doxorubicin treated groups showed significant (p<0.001) decrease in SOD levels when compared with the control group. However, treatment with Arnica montana (p<0.001) and Cactus grandifloras (p<0.001) significantly prevented the decrease in SOD levels.

Table 6. SOD level data showing Mean ± SD

SOD		
S. No.	Groups	Mean ± SD
1	Control	3.93 ± 0.32
2	Dox	0.49 ± 0.19 a***
3	Arnica montana Low Dose	2.47 ± 0.309 a***, b***
4	Arnica montana High Dose	3.43 ± 0.29 a*, b***, c***
5	Cactus grandifloras	3.58 ± 0.29 b***, c***

Effect of Arnica montana on GSH levels in different treatment groups

Table 7 and Figure 6 show the alterations in GSH level after treatment with doxorubicin, Arnica montana and Cactus grandifloras. Doxorubicin treated groups showed significant (p<0.001) decrease in GSH levels when compared with the control group. However, treatment with Arnica montana (p<0.001) and Cactus grandifloras (p<0.001) significantly prevented the decrease in GSH levels.

Table 7. GSH level data showing Mean ± SD

S. No.	Groups	Mean ± SD
1	Control	2.96 ± 0.16
2	Dox	1.21 ± 0.08 a***
3	Arnica montana Low Dose	1.37 ± 0.084 a***
4	Arnica montana High Dose	2.61 ± 0.24 a*, b***, c***
5	Cactus grandifloras	2.22 ± 0.31 b***, c***, d*

CONCLUSION

Myocardial infarction is a disorder of cardiac cells injury, whenever the muscle tissue is not receiving enough oxygen in at atleast one area, myocardial localised necrosis occurs. This occurs while the blood flow to such cardiac muscle is restricted. Myocardial areas of localized necrosis can happen over and again in individuals with constant illness or they may be the underlying indication of coronary supply route sickness. In this study we concluded that arnica montana is effective

against the disease. Where is arnica montana raise the LDH and Catalase level, as well as decreases the CKMB, TBARS, SOD and GSH level. Thus the arnica montana provides the treatment against myocardial infarction.

Acknowledgements

The authors are grateful to the Parmarth College of Pharmacy, Hapur, for providing chemicals and instrument and allowing them to complete the research in the their laboratory.

Conflict of Interests

The authors have no conflicts of interest.

Reference

1. Achika, J. I., Arthur, D. E., Gerald, I., & Adedayo, A. (2014). A review on the phytoconstituents and related medicinal properties of plants in the Asteraceae family. *IOSR J Appl Chem, 7*(8), 1-8.
2. Adin, C. A., Sereda, C. W., Thompson, M. S., Wheeler, J. L., & Archer, L. L. (2006). Outcome associated with use of a percutaneously controlled hydraulic occluder for treatment of dogs with intrahepatic portosystemic shunts. *Journal of the American Veterinary Medical Association, 229*(11), 1749-1755.
3. Amorim, M. H. R., Gil da Costa, R. M., Lopes, C., & Bastos, M. M. (2013). Sesquiterpene lactones: adverse health effects and toxicity mechanisms. *Critical reviews in toxicology, 43*(7), 559-579.
4. Antman, E. M., Anbe, D. T., Armstrong, P. W., Bates, E. R., Green, L. A., Hand, M., . . . Jacobs, A. K. (2004). ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction--executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 1999 Guidelines for the Management of Patients With Acute Myocardial Infarction). *Circulation, 110*(5), 588-636. doi:10.1161/01.cir.0000134791.68010.fa
5. Bentzon, J. F., Otsuka, F., Virmani, R., & Falk, E. (2014). Mechanisms of plaque formation and rupture. *Circ Res, 114*(12), 1852-1866. doi:10.1161/circresaha.114.302721
6. Bessada, S. M., Barreira, J. C., & Oliveira, M. B. P. (2015). Asteraceae species with most prominent bioactivity and their potential applications: A review. *Industrial Crops and Products, 76*, 604-615.
7. Canty Jr, J. M., & Fallavollita, J. A. (2000). Chronic hibernation and chronic stunning: a continuum. *Journal of Nuclear Cardiology, 7*(5), 509-527.
8. Cooper, R., Cutler, J., Desvigne-Nickens, P., Fortmann, S. P., Friedman, L., Havlik, R., . . . Morosco, G. (2000). Trends and disparities in coronary heart disease, stroke, and other cardiovascular diseases in the United States: findings of the national conference on cardiovascular disease prevention. *Circulation, 102*(25), 3137-3147.
9. Dariolli, R., Takimura, C. K., Campos, C. A., Lemos, P. A., & Krieger, J. E. (2014). Development of a close-dartery catheter based myocardial infarction in pigs using sponge and lidocaine hydrochloride infusion to prevent irreversible ventricular fibrillation. *Physiological reports, 2*(8), e12121.
10. Desai, V. G., Kwekel, J. C., Vijay, V., Moland, C. L., Herman, E. H., Lee, T., . . . Muskhelishvili, L. (2014). Early biomarkers of doxorubicin-induced heart injury in a mouse model. *Toxicology and applied pharmacology, 281*(2), 221-229.

How to cite this article:

Vikas Kumar et al. (2025). Evaluate the effect of arnica montana on doxorubicin-induced myocardial infarction in wistar albino rats, International Journal of Current Advanced Research, 14(04), pp.189-195.

****