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Histopathological and Biochemical Effects of Doxorubicin Drug on the Functions of Heart in White Rats

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ABSTRACT

The aim of this study is to know the effect of doxorubicin on the function of heart. The drug was administrated for three and six weeks. The animals were sacrificed after 48 hr. of the last inject.

This study revealed a significant increases in the activity of lactate dehydrogenase and Creatine Kinase enzyme in the rats' serum when administrated the animal doxorubicin intraperitoneally, for 3 weeks and not significantly increase when administrated for six weeks. Histopathological changes in cardiac tissues revealed a congestion in the blood vessels thrombus and thickness of the wall blood vessels, a dilation of the blood vessels, a prevascular infiltration of the inflammatory cells, infiltration of the inflammatory cells in cardiac muscle, focal lymphocyte infiltration, oedema, hyalinization and loss of striation.

Keywords: Doxorubicin, Cardiotoxicity, Creatine Kinase, Lactate Dehydrogenase, Rats.

Softtissue

Hodgkins disease

sarcoma

osteogenic

Breast	Acute Leukmia	Non Hodgkins Lymphoma	
Lung tumer	Thyroid tumer	Genitor urinary	cancer
	.(Brunton <i>et al.</i> , 2011)	Neoroblastoma	Stomach cancer
(2008)	Aleisa		
	RNA	DNA	
			(Abou Seif, 2012)
Renal Tubules	Renal glomeruli	(degenerative change)	
Parietal	Flat epithelial	Capillaries	Dilation
Endothelial	Vacuolation	Bowman membrane	Layer
(Ayla <i>et al.</i> , 2011)	Microvilli		cells
	2.5mg/Kg	(2010)	Ibrahim
Fatty		Kupffercell proliferation	
Liver Fibrosis	(El-sayyed <i>et al.</i> , 2009)		degeneration
.Focal cellular	granulomatous lesions	spots	
.			
Dox, Hydroxydaunorubicin hydrochlorid			
(84)		Ebewe pharmaes.m.b.h. Unterach Austria	
/ 1		(Bozcali <i>et al.</i> , 2009)	
(Powis and Kooistra, 1987)	/ 2	(El-Sayyed <i>et al.</i> , 2009)	
		.(Patil and Balaraman., 2009)	/ 3
<i>Rattus norvigus</i>	50	:	
		225–200	(3.5–2.5)
		(ALshabanah <i>et al.</i> , 2010)	normal saline
		:	
(6)	30	:	:
		:	
			-1
.	/ 1		-2
.	/ 2		-3

.....

. / 3 -4
 . / 4 -5
 . / 5 -6

: :

6 (12) 20
 : 4

.
 . 6 / 1 -2
 . 6 / 2 -3
 . 6 / 3 -4

(Patil and Balaraman, 2009) 48

15 3000

Phosphobuffer saline CK LDH ° (80 -)
 10%

:

(LHD) -1

Estemation of Lactate dehydrogenase (LDH) Activity in blood serum

:

Biolabo LDH
 Lactate Pyruvate LDH (Tietz, 1999)
 : Nicotinamid Adinine Dinucleotide (NADH)

NAD NADH

.340

: LDH
 $8095 \times \text{ / } = (\text{LDHCLU/L})$
 (CK) -2

Estimation of serm Creatine Kinase (CK) Activity in blood serum

:

Biolabo CK
 : (Tietz, 1999)

340

CK

:

$$333 \times (\quad / \quad) = (\quad / \quad)$$

15 %10

(paraffin wax)

impregnated

100% 90% 70%

(5-6)

3 ° 60

(Luna, 1968)

(Harris Haematoxylin and eosin stain)

. Japan OM Olympus

:

Duncan Multiple

.(2010) .

Range Test

:

-1

/ 1

(1)

/ 3

/ 2

/ 5

/ 4

(2)

/ 3

/ 2

/ 1

(Assiri and Abdel-Whab, 2003 ; Patil and Balaraman,

2009; Ibrahim *et al.*, 2010; Thippeswamy *et al.*, 2011; Swamy *et al.*, 2012)

electrophoresis

Isozymes Fraction

Biggs)

Fraction 1

(and Woodson, 1973

Creatine Kinase

-2

/ 1

(3)

3

/ 2

/ 4

/

/ 4

/ 5

.....

Creatine Kinase (4)

1

/ 3 / 2 /

(Assiri and Abdel-Wahab, 2003; Patil and Balaraman, 2009; Ibrahim *et al.*, 2010; Thippeswamy *et al.*, 2011 ; Swamy *et al.*, 2012)

Disorder

(Biggs and Woodson 1973) of Muscles

necrosis

Muscular dystrophy

(Kamath, 1972) Cellular permeability

CK LDH

(Swamy *et al.*, 2012) Cardiac Injury

: 1

±

(0. 05)

(Duncan test)

:2

± *

(Duncan test)

(0.05)

Creatine Kinase

:3

±

Duncan)

(0.05)

.(test

Creatine Kinase :4

±

. (Duncan test)

0.05

: -2

- Pyknosis / 1 (5)
- hyalinization severe necrosis zenker necrosis
- infiltration of inflammatory cells Loss of striation
- / 2 (7) oedema (6)
- thrombus dilation of blood vessels
- infiltration of inflammatory
- vacuolation (8) cell
- . (9) Vascular degenerative / 3
- oedma / 4
- vaculation hyalinization zenkner necrosis
- / 5 . (10)
- (11) Loss of striation
- fatty degenerative / 2 (12)
- / 3 . (13) zenker necrosis
- (Assiri and Abdel Wahab, (15) (14)
- 2003; Ibrahim *et al.*, 2010;Thippeswamy *et al.*, 2011; Swamy *et al.*, 2012)

(Singal *et al.*, 1997, Swamy *et al.*, 2012)

(Singal *et al.*, 1997) Cardiac injury subcellular change
 damage from Oxygen supply permeability
 .(Thipeswamy *et al.*, 2011) cell leakage of enzymes

(H) :6
 .(FOC) (HYA)
 .(H & E420X)

:5
 .(H & E420X) .C

(CON) :8
 (INF)
 .(& E105) .(PAR) (PRE)

(O) :7
 420X.H) .(ZEN) (H)
 .(& E

(N) :10
(V)
(INF)
(420X H & E)

(V) :9
(THR)
(THI)
(420X H & E)

(FAT) :12
(COA)
(H & E
420 X.

:11
(FOC)
(420x H & E)

(N) (V) :14
(H) (INF)
(420X H & E)

(V) (N) (INF) :13
(420X. H)
& E

."SAS

".(2010)

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