

# Introduction

Acute liver failure (ALF) is a life-threatening clinical syndrome manifested by jaundice, ascites, hepatic encephalopathy, and a bleeding tendency in a patient without previously known liver disease. To date, the Management of severe ALF is through liver transplantation which carries several disadvantages. So, there is an urgent need for novel therapeutic options. Stem cells are unspecialized immature progenitor cells that can self-renewal and differentiate into multiple cell lines. Platelet-rich plasma (PRP) is an autologous plasma solution that expresses various growth factors.

# Aim of the work

The aim of the present work was to evaluate the biochemical, histological, and immunohistochemical changes induced by stem cells alone and in combination with PRP on rat liver treated with Acetaminophen.

# Patients and Methods

Five groups of male rats were treated as follows: Group 1 was the control group, group2 was given CCl4 in olive oil (2.5 ml/kg, IP), Group 3 was administer edacetaminophen (APAP) in sterile saline (1gm / kg, IP),group 4 was given APAP then were injected with stem cells (3 x10<sup>6</sup> cells / ml: 1ml / kg) 24 h after APAP injection, group 5 was injected by APAP then were injected with stem cells (3 x suspended in PRP 24 h after APAP injection. Blood samples were taken for determination of serum alanine aminotrans ferase (ALT), as partate trans aminase (AST), and albumin, liver specimens were collected for histopathological examination.

# Results

Table 1: Comparison of biochemical measurements between the group treated with stem cell and other studied groups of the Albino rat

Biochemical measurements		Stem cell group (n=20)	Control group (n=10)	Acetaminophen group (n=10)
ALT	min-max	70-349	48-66	300-384
	mean ± SD	213.7 ± 99.7	57.9 ± 6.6	352.0 ± 23.2
	t test (p-value)		4.894 (<0.001)	-4.294 (<0.001)
AST	min-max	180-425	140-160	419-440
	mean ± SD	292.5 ± 88.1	151.6 ± 6.2	430.5 ± 8.2
	t test (p-value)		5.006 (<0.001)	-4.898 (<0.001)
Albumin	min-max	1.2-3.2	3.3-4.9	1.3-2.1
	mean ± SD	2.3 ± 0.6	4.2 ± 0.6	1.5 ± 0.3
	t test (p-value)		-8.067 (<0.001)	3.816 (<0.001)

Table 2: Comparison of biochemical measurements between the group treated with stem cell & PRP and other studied groups of the Albino rat.

Biochemical measurements		Stem cell & PRP group (n=20)	Control group (n=10)	Acetaminophen group (n=10)
ALT	min-max	54-350	48-66	300-384
	mean ± SD	195.9 ± 108.1	57.9 ± 6.6	352.0 ± 23.2
	t test (p-value)		3.999 (<0.001)	-4.479 (<0.001)
AST	min-max	165-428	140-160	419-440
	mean ± SD	274.9 ± 97.5	151.6 ± 6.2	430.5 ± 8.2
	t test (p-value)		3.961 (<0.001)	-4.995 (<0.001)
Albumin	min-max	1.2-3.5	3.3-4.9	1.3-2.1
	mean ± SD	2.4 ± 0.7	4.2 ± 0.6	1.5 ± 0.3
	t test (p-value)		-6.672 (<0.001)	3.893 (<0.001)

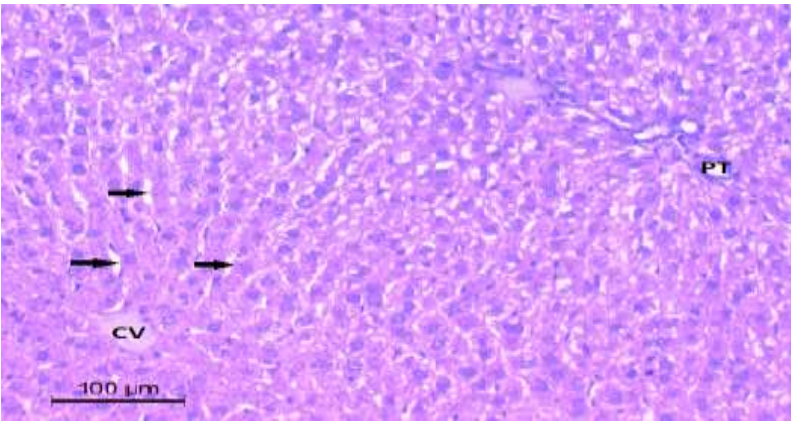


Figure 1: Photomicrographs of control rat liver showing a preserved architecture of the liver, central vein (CV) and cords of hepatocytes radiating from it separated by Slit-like blood sinusoids (arrows). Portal tract (PT).

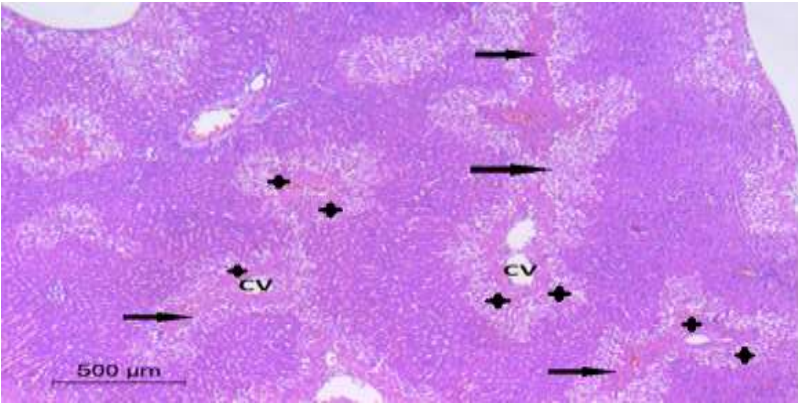


Figure 2: Photomicrographs of rat livers of the APAP group showing disorganized hepatic architecture with many areas of pericentral confluent necrosis(stars) and Bridging necrosis (arrows). Central vein (CV).

# Conclusion

The stem cells alone and in combination with PRP could ameliorateacute liver failure induced by acetaminophen in adult male albino rats.