



Klebsiella pneumoniae

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Abstract

The Present study investigated the effect of the polysaccharide extracted from the bacteria *Klebsiella pneumoniae* on immune response of white mice experimentally infected with secondary hydatid disease caused by *Echinococcus granulosus*.

Criteria taken into consideration included the changes in numbers, weights and diameters of the hydatid cysts and the percentage of their reduction, in addition, changes in weights of liver and spleen and their organ index. The changes in total and differential count of WBCs in peripheral blood of mice treated with polysaccharide in comparison with the positive control (mice infected with secondary hydatid disease and not treated with polysaccharide) and negative control (mice neither treated with polysaccharide, nor infected with hydatid disease), three month post infection, was studied. The results revealed a decrease in numbers, weights and diameters of hydatid cysts in mice treated with the polysaccharide in comparison with positive and negative control, supported by the reduction of cyst numbers in treated mice. A decrease in weights and organ index of the liver in treated mice compared with positive control, increase in the weights and organ index of spleen in treated mice compared with positive and negative control, An increase in total count of WBCs, Regarding the differential count of WBCs, an increase in the percentage of lymphocytes and decrease in the percentage

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Klebsiella pneumoniae

of monocytes, neutrophils and eosinophils in treated mice in comparison with positive and negative control, was observed, Basophils were neglected because of their rarity.

It can be concluded that the polysaccharide extracted from *K.pneumoniae* can be used as an active and non toxic immunomodulator against infection with secondary hydatid disease in white mice.

Klebsiella Pneumoniae

.Echinococcus granulosus

)
) (

K .pneumoniae

Echinococcosis

Taeniidae

Echinococcus

E. multilocularis *E. granulosus*

cystic echinococcosis

alveolar echinococcosis

[1]

Immunomodulators

[2]

Cryptococcus neoformans

Assreuy [3] T

Porphyra haitanensis *et al.* (2008) [4]

Thymus

Wong *et al.* (2009 [5]) .gland

[6]

Macrophages

[7]

IL-1

Capsular . [8]

C3

polysaccharide

[9]

K. pneumoniae

:

/ *K. pneumoniae* /

[10] / /

:

[11] Staub (1965)

[12] .

[13] Dubois *et al.* (1956)

:

BALB/c / /

:

()

[14] Smyth (1985) .

[15] Smyth and Barrett (1980)

.Intraperitoneal cavity [16]

:

:

:

/



:

:

:

:

:

Diethyl ether

[17]

Total count

EDTA

Blood films

Differential count

.Giemsa stain

:

-

Vernier

:

-

Organ index

Mettler HR- 200 Japan

:[18]

$$X \frac{\text{وزن العنصر}}{\text{وزن الجسم - وزن الأكياس}} =$$

% ,
() ,

Antibody dependent cellular cytotoxicity (ADCC)

Cytotoxic lymphocytes .[19]

Natural killer cells

.[20]

Cortes *et al.*(2002 [21])

Schepetkin and Quinn (2006) [22]

Dang *et al.* (2009) [23]

E.granulosus

. Tetraspanine

.()

Granuloma

[25] Al-Shwani (2011) . [24]

E.granulosus

[26] Ali and Ali ()

: ()

()

| % | () | () | | () |
|---------|--------------|--------------|--------------|----------------|
| | ± | ± | ± | |
| 0.00 | 3.209±26.40 | 0.374±2.00 | 1.303±8.20 | C ⁺ |
| %70.731 | 0.648±1.70** | 0.219±0.44** | 0.894±2.40** | 300 |
| %75.609 | 1.253±1.98** | 0.164±0.78* | 0.707±2.00** | 400 |
| %53.658 | 1.013±2.76** | 0.151±0.96* | 1.923±3.80** | 500 |

: c-

: c+

(P<0.01)

: ** (P< 0.05)

: *

()

Sarciron *et al.* () [27]

()

Isoprinosine

[28] Chen *et al.*

Ali [29] (1999)

(P<0.05)

Aureobasidium Pullulans

()

[30]

[32] Inan *et al.*(2010)

.Anaphylaxis [31]

Heamatomas

()

Bacillus Lactobacillus

[33]

cereus

[35] Lia *et al.* () [34]

Ganoderma lucidum

B T

Dendretic cells

()

Judson *et al.* (1985) [36]

E. granulosus

Walker

B T

Crude extract

et al. (2004) [37]

:()

()

| | | | | |
|---------|---------|-------------|-------------|----------------|
| | () | | () | |
| ± | ± | ± | ± | () |
| , ± , | , ± , | , ± , | , ± , | C ⁻ |
| , ± , | , ± , | ± , ** , | , ± , ** | C ⁺ |
| * , ± , | * , ± , | ** , ± , | ** , ± , | 300 |

| | | | | |
|-------|-------|-------------|-------------|-----|
| , ± , | , ± , | ** , ± , | ** , ± , | 400 |
| , ± , | , ± , | , ** , ± | ± , ** , | 500 |

/
K.pneumoniae .()
CD₄⁺ IL-17

Pang *et al.*(2007) [39] [38]

Leukocytosis

/
.() /

E.granulosus
Sackesen *et al.*(2011) [41] [40]

%
.()

Kalk-

Bacteroides Moll *et al.* (2000) [42]

B T *fragilis*

[43] Omarsdottir *et al.* (2005)

IL-10

Aspergillus fumigates

Vaccine – dependent protection

. [44]

.() % , %

B T *E. granulosus* B

[45]

E. granulosus

[46]

Monocytes

.()

%

[47] Amersfoort *et al.* (2003)

Receptors

Li *et al.* (2008) [48]

.() % ,

% ,

[49] Persat *et al.* (1996)

E.multilocularis

Mathiak *et*

Galβ1 6Gal

al.(2002) [50]

.Salmonella typhosa

%

.()

[51]

[52]

E.coli O

S.aureus

[53] Mchoughlin *et al.*, (2008)

IF-γ

% ,

B

() % ,

Zhang *et al.*, [54]

[55] (2003)

%,
 .()
Cryptoporus volvatus

[56]

T- helper T

[57]

) % , % ,

C5

.(

[58]

[59] Hashemitabar *et al.* (2006)

E. Whole body antigen

. *granulosus*

| % | | | | | () |
|-------------|------------------|--------------|-------------------|-----------------------|----------------|
| Eos. | Neu. | Mono. | Lym. | | |
| ± | ± | ± | ± | ± | |
| 1.290±4.50 | 5.377±65.25 | 2.516±8.50 | 4.349±21.75 | ±3300.00 476.09 | C ⁻ |
| 0.894±2.60 | 4.207±35.80 | 1.949±7.40 | 4.949±54.00* | ±5840.00* 384.707 | C ⁺ |
| 0.547±1.60 | ±9.00** 2.449 | 1.414±3.00** | ±86.00** 3.674 | ±11440.0** 2871.93 | 300 |
| 0.707± 2.00 | 4.335± 23.60* | 1.640±8.40 | 3.391 ±66.00* | ±9500.00* 894.42 | 400 |
| 1.816± 1.60 | 4.549 ±22.20* | 1.581± 5.00 | ±71.00** 4.690 | ± 8000.00* 424.26 | 500 |

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